Objectivity and the Escape from Perspective

LORRAINE DASTON

DOS OBJECTIVITY HAVE A HISTORY?

Our usage of the word "objectivity" (French objectivité; German, Objektivität) is hopelessly but revealingly confused. It refers at once to metaphysics, to methods, and to morals. We slide effortlessly from statements about the "objective truth" of a scientific claim, to those about the "objective procedure" that guarantees a finding, to those about the "objective matters" that qualify a research. Current usage allows us to apply the word as an approximate synonym for the epistemic (or, more narrowly, the factual); for the scientific, in the sense of public, empirically reliable knowledge, for impartiality-into-self-effacement and the cold-blooded pursuit of the supernatural, in the sense of compelling seems from all rational minds, as they lodged in human, animal, or angelic bodies; and for the "really real," that is to say, objects in themselves independent of all minds except, perhaps, that of God. In its thick layering of oddly matched meanings—it is not self-evident, for example, what the repression of the emotions has to do with the zoological bedrock—our concept of objectivity bears signs of a complicated and contingent history, much as the layering of postcards, matchbooks, and riveted cans would help us to trace the fabric in an archaeological aim.

This paper is meant as a modest contribution to that still porous history. Instead of objectivity has been a theme in recent science studies, it is questions of existence and legitimacy that have exercised discourses, rather than those of history. Neither the question of whether objectivity exists in nature (and if it does, which disciplines have it), nor that of whether it is a good or bad thing (the theme of some recent feminist literature), will concern me here. All sides of these several debates have largely assumed that objectivity is and has been a central and immutable concept, at least since the seventeenth century. So persuasive and apparently persuasive is this assumption that it is rarely even entered. These few words which mention objectivity and history in the same breath examine how various sciences—mechanics, optics, chemistry, biology—successively cross the threshold of objectivity as specific historical practices, but the implication is that objectivity itself has no history? Among philosophers, those who have written analytically about objectivity recognize (for example) the conceptual flanks lines that separate various mean-
ings, but all nevertheless treat it as a transcendental given. Few of these recent studies, even those most directly concerned with objectivity in the sciences or with the historical context in which objectivity allegedly emerged once and for all, seriously entertain the hypothesis that objectivity might have an ongoing history intimately linked to the history of scientific practices and ideals. Instead as objectivity has a history for these writers, be they old-fashioned positivists or new-fangled feminists, it has a birthday (usually a Cartesian one, either 1637 or 1644), when it allegedly arrives on the scene full grown and in its full armour, like Athena from the head of Zeus.

In the fact of such widespread conviction to the contrary, it would be natural to ask what grounds we have to believe that objectivity in the sciences does have a history. The conceptual layers I mentioned are a clue to that history, but concrete examples are needed to make the claim interesting as well as plausible. In what follows I shall sketch one episode in the history of objectivity—namely, the ascendance of the ideal of what I will call "aperspectival objectivity" in nineteenth-century science.

Aperspectival objectivity has been praised as "a method of understanding... A view or form of thought is more objective than another if it relies less on the specifics of the individual's makeup and position in the world, or on the character of the particular type of creature he is," it has also been blamed for...
natural sciences, as a result of a reorganization of scientific life that multiplied professional contacts at every level, from the international commissions to the well-staffed laboratory. Spectral objectivity became a scientific value when science came to consist in large part of communications that crossed boundaries of nationality, training, and skill. Indeed, the essence of apercipient objectivity is communicability, narrowing the range of genuine knowledge to coincide with that of public knowledge. In the extreme case, apercipient objectivity may even sacrifice depth or more accurate knowledge to the demands of communicability.

My argument in support of these claims has four parts. I first give a very brief overview of the meanings of objectivity in the late eighteenth and early nineteenth centuries, in order to establish, thus what I have called apercipient objectivity were not among them. I then examine the moral and aesthetic writings of Shaftesbury, Hutcheson, and Adam Smith, where, under the label of the concept is most fully developed. From them, I adduce the situation in the natural sciences, overlooking the nineteenth-century attempts to eliminate all notions of the personal, with earlier practices. Finally, I conclude with some thoughts about how and why apercipient objectivity took on moral overtones.

WHAT OBJECTIVITY MEANT

The terms 'objective' and 'subjective' were native to scholastic philosophy, where they signified something quite different from what they do now; 'objective' meant chiefly the objects of thought, rather than to those of the external world. These terms were of ontological, not epistemological import in last medieval discussions of universals, and were favored with a strong Augustinian, afterlife: truly good objects were ideas in the divine mind. The scholastic meaning of objectivity can be found in Descartes, who wrote of objects of 'objective reality' contained by various ideas, and indeed in many eighteenth-century philosophical sources, at least in English and German. In French, objectif long and with point I for approximately the same semantic territory, is the eighteenth century, the primary definition of objectif was that part of a microscope bearing the cognate name in English, with a secondary, ontological definition roughly denoting 'degree of inertia (as opposed to formal or actual reality).''

All of these medieval and early modern usage pertains to the word 'objectivity,' its variants and cognates, and these do not necessarily coincide with practices and ideas that we would now recognize as part of (at least akin to) our conception of objectivity. For example, the codes of impartiality and disinterestedness developed by jurists in this period clearly capture some of the connotations of objectivity in our sense, although these were not yet coupled with the word 'objectivity.' Moreover, as Peter Dear shows, some of these legal notions, along with legal procedures for the evaluation of testimony, were imported into early modern natural philosophy. Yet it is still of importance to know when and how word and thing intertwined, the choice of which word to attach to which thing is never arbitrary. When, sometimes around the turn of the nineteenth century, the word 'objectivity' absorbed the juristic meanings of impartiality along with the philosophical associations of external physical objects, it did not lose its more ancient ontological overtones. It is this slow process of accretion and absorption that accounts for the layered structure of the notion of objectivity, and it is the historian's problem to explain when and how it became possible to bridge such originally disparate meanings and associations under the same linguistic roof. This is why the history of objectivity must always be understood as a process of integration and extension.
between word and thing, attending to both. A history of the word without the thing risks degenerating into etymology; a history of the thing without the word risks anachronism.

A few eighteenth- and early-nineteenth-century philosophical texts (the word, if not the thing, being the near exclusive possession of philosophers and theologians during this period) will serve to illustrate the ontological import of the term. In 1746, Bishop Berkeley could still invoke the scholastic tenets of the word without paradox or redundance: "Natural phenomena are only natural appearances. They are, therefore, such as we see and perceive them: Their real and objective natures are, therefore, the same;"13 here, "objective" means what is perceived, and is in principle distinguishable from the "real." But C. A. Crusius, writing in 1747, registers a shift in meaning closer to the modern sense, all the while preserving the older, theological overtones:

One divides the truth into the objective or metaphysical [objektivische oder metaphysische], which is nothing other than the reality or possibility of the object itself ... [and into the] subjective or logicalistic [subjektivische oder logische], which is the truth in a really existing mind. ... All objective truth is thus in the divine mind a subjective truth.14

Here is a recognizable variant of our outside-inside version of the objective/subjective distinction, at least where mortal minds are concerned.

These are citations taken more or less at random, and they witness rather than fix the meanings of the word "objectivity" during this period. It is Kant who appropriated the old scholastic derivative objektiv as a technical term and gave it a new lease on life as a key concept in philosophy, albeit a concept that still differs significantly from our own. Kant's "objective validity" (objektive Gültigkeit) pertains not to external objects in so, but rather to the relational congruities (such as time, space, and causality) which are the preconditions of experience.15 For our purposes, Kant's own use of the term is less important than its adoption and adaptation by later, more mindful followers, such as Samuel Taylor Coleridge. It was Coleridge who seems to have reintroduced the term into English philosophical usage in 1817, and it was his creative misunderstanding of Kant that crystallized an opposition of objective and subjective which we can at last readily recognize if not wholly embrace:

Now the sum of all that is merely objective we will henceforth call matter, confining the term to its passive and material sense, as comprising all the phenomena by which its existence is made known to us. On the other hand, the sum of all that is subjective, we may comprehend in the name self of intelligence. Both conceptions are in necessary antithesis. Intelligence is conceived of as exclusively representative, the one conscious, the other as without consciousness.16

This gallop through the eighteenth- and early-nineteenth-century usage of the word "objectivity" and its variants in English, French, and German (all deriving and then diverging from the Latin terminology of scholasticism) is intended to make three points. First, "objectivity" concerned ontology, and, post-Kant, to some measure epistemology as well transcendent mental. It had little or nothing to do with emotional detachment, restraint from judgment, method and measurement, or empirical reliability. Second, its inseparable opposite, subjectivity, is the sense of the mental, had yet to become a matter for regret or reproach. On the contrary Coleridge branded our instinctive belief in the existence of things independent of us "prejudice," and thought "the highest perfection of natural philosophy would consist in the perfect spiritualization of the laws of nature into the laws of intuition and intellect."17 Third, the perspective metaphor that so permeates our discussions of objectivity is (so to speak) nowhere on view.18
This is not to say that perspectivity and its encroachment of metaphors were wholly absent from philosophical discussions during this period—only that they were not yet attached to objects, that is, to scientific and philosophical problems of describing and understanding the natural world. Rather, the divergence, irreconcilability, and epistemology of individual perspectives were the province of moral philosophy and aesthetics. [The most notable exception is Leibniz's thoroughly perspectival metaphysics of the Monadology (1714), but this remains an isolated case.] Here the problem of reconciling individual viewpoints on the same issue emerges full-blown, with the full complement of virtues we now attribute to objectivity (but not yet attached to that term): detachment, impartiality, disinterestedness, even self-effacement—all are enlisted to make shared, public knowledge possible. However, the issues that demand these virtues are not measurements of a certitude position as chemical observations, but rather the dramatic merits of a Roman comedy or the probity of accepting undervalued praise. Eighteenth- and nineteenth-century discussions of perspectivity agree in both their means (de-individualization, emotional distance) and ends (universal knowledge of one sort or another), but they treat very different objects: moral and aesthetic clones on the one hand, and scientific claims on the other.

Given the contours of time and space, a few examples drawn from the eighteenth-century moral and aesthetic literature must suffice to make this contrast vivid. All those who maintained the existence of universal standards of the beautiful, such as Shaftesbury and Hume, had recourse to the language of individual perspective and critical self-effacement. Consider Hume's advice on judging works of art:

In like manner, what are works is addressed to the public, though I should have a friendship or emulation with the author. I must deplore this situation, and, considering myself as a man in general, forget, if possible, my individual being, and not peculiar circumstances. A genius influenced by prejudice, complies not with this condition, but obstinately maintains his natural position, without placing himself in that point of view which the performances suppose... If in this case his sentiments are perceived, and have the same beauties and defects of the same influence upon him, as if he had imposed a preposterous strain on his imagination, and had forgot himself for a moment. So far his taste wholly departs from the true standard, and from consequence from all credit and authority.25

Here are almost all the familiar elements of perspectival objectivity: the peculiarization of an individual's "natural position" must be checked by "forgetting" one's self in order to attain "the true standard." But the true standard here is that of "catholic and universal beauty," not that of material nature.

Hume's aesthetic version of perspectival objectivity also departs from the later scientific sort in one other important particular. Hume remembers that the classic cultural perspectival supplement, the ability to assume myriad other points of view, other than the real escape from perspectival implied by the "view from nowhere." However, the map from such empathic simultaneity to detached objectivity was a short one, and did not require abandoning the human for the natural domain. Adam Smith's Theory of Moral Sentiments (1759) proceeds in incremental steps from the psychological tug and pull of sympathy, which unites us at least partly into the minds and hearts of our fellows, to the more radical detachment of an idealized impartiality that transcends all particular viewpoints: "The first promptings of a moral sense come from the insensible and empathetical sympathy that gives the spectator to feel some of the anguish of the
In the same manner, to the selfish and original passions of human nature, the loss or gain of a very small interest of our own, appears to be of vastly more importance, excites a much more passionate joy or sorrow, a much more ardent desire or aversion, than the greatest concern of another with whom we have no particular connexion. His interest, as long as they are surveyed from this station, can never be put into the balance of our own... Before we can make any proper comparison of those opposite interests, we must change our position. We must view them, neither from our own place nor from his, neither with our own eyes nor with his, but from the place and with the eyes of a third person, who has no particular connexion with either, and who judges with impartiality, between us.\textsuperscript{18}

As in Hume's aesthetics, Smith blames deviation from the "true" moral standard on the prejudices of an unsuitable perspective, self-interest being at once the worst and most common of these perspectival-distortions. In this context, scientists were held to be exemplary by the eighteenth-century perspectival philosophers, but not because science was presumed free of particular perspectives—that is, "objective" in our latter-day sense. Rather, scientists were revered as protagons of the Virtue of disinterestedness, both in the immediate sense of forswearing the motives of selfish gain, and in the more remote sense of remaining serene in the face of public apathy or contempt. Shaftesbury took the contemplative joy of the mathematician as the paradigm for all moral and aesthetic impulses that abandoned "private interest" and "self-good."\textsuperscript{19} Adam Smith admired the indifference of the mathematician and natural philosopher to abstract public opinion as akin to the indifference of a wise man unjustly condemned for actions he himself knows to have conformed to the "exact rules of perfect propriety." In contrast to the endless bickering and intriguing of poets to prep up their reputation, Smith believed mathematician and natural philosophers to be "almost always men of the most amiable simplicity of manner who live in good harmony with one another."\textsuperscript{20} Smith's sanguine view of the character of savants was based on an overly conditional reading of the academic deign of Newton,\textsuperscript{21} and was at times hubristically inaccurate, as when he supposed that Newton had been so noxious about the public reception of the Principia that his "tranquility... never suffered, upon that account, the interruption of a single quarter of an hour."\textsuperscript{22} However, for our purposes, the accuracy of this image of the disinterested scientist is less important than its widespread currency and its pervasive grounds. Mathematicians and, to a lesser extent, natural philosophers were allegedly disinclined because indifferent to public opinion, and they were indifferent because the certainty or our certainty of
their "demonstrations" freed them from evaluations based only on "a certain theory of facts." Thus, it was not so much the universality or physical necessity of scientific subject matter as the certainty of scientific arguments (even if evident initially only to their authors) that guaranteed scientists a certain acausal detachment in the eyes of the moral philosophers.

However, disinterest was hardly full-blown aperceptual objectivity. As we have seen, the "other" concept was not unknown to eighteenth-century thinkers, but its nature was less aesthetic and, especially, more philosophical, not the natural sciences. It is in this moral realm, rather than in that of ontological objectivity, that the subjective—or the "private," as it was usually—and more revealingly called—acquired an unsavory side. Kant could use the "subjective" and the "empirical," both believed by a prehistory "messy," as near-synonyms in his treatment of duty, to remove was his moral conception of objectivity from the natural sciences. Yet there is an emblematic if uncharacteristic passage in Kant's first Critique that heralds this shift in the meaning of objectivity toward public knowledge. Distinguishing between "objective grounds" for and "subjective causes" of belief, Kant failed the truth of an idea "(agreement with object)" to the communicability of the idea: "The resolutions of belief [Erkenntnislust], whereby it is [objective] conviction or merely [subjective] persuasion, is thus, externally, the possibility of communicating it." For communicability is made possible both by the shared rationality of minds and the shared object to which the idea refers. Kant was careful or point out that communicability by itself was only a "subjective means" to overcome the privacy of one's judgment, and did not sufficiently create full, "objective" persuasion. Nevertheless, Kant's combination of the ontological meaning of a shared object, the epistemological meaning of shared reason, and the social meaning of shared information under the rubric of the "objective" invited a blurring of these distinctions, and proved prophetic of things to come. By the latter half of the nineteenth century, aperceptual objectivity had displaced (though not entirely replaced) ontological objectivity in philosophical discourse, and the natural sciences were taking as its fullest realization.

**APERCEPTIVAL OBJECTIVITY AS SCIENTIFIC OBJECTIVITY**

The various kinds of objectivity might be classified by the different subjectivities they oppose. By the mid-nineteenth century, ontological objectivity had come to oppose consciousness per se, and mechanical objectivity opposed interpretation. The aperceptual objectivity attributed to late-nineteenth century science opposed the subjectivity of individual idiosyncrasies, which substituted for the individual interests and "situations" analyzed by the eighteenth-century moral perspectives. Just as the transcendence of individual viewpoints in deliberation and action seemed a precondition for a just and harmonious society to eighteenth-century moralists, so the transcendence of the same in science seemed to some nineteenth-century philosophers a precondition for a coherent scientific community. The existence of such a community, reaching over time and space, in turn seemed a precondition for—aside from external guarantees of—reaching scientific truth.

Charles Sanders Peirce conceived of the necessarily communal form of truth seeking as proceeding by a kind of symmetric cancellation of individual errors.

The individual may not be to reach the truth; there is a relation of error in every individual's opinion.
OBJECTIVITY AND THE ESCAPE FROM PERSPECTIVE

No more, it seems, that there is a definite opinion to which the mind of man is, on the whole and in the long run, ending... This final opinion, then, is independent, not indeed of thought in general, but of all that is arbitrary or individual in thought; it is quite independent of how you, or I, or any number of men think.

The objectively real is not that which eliminates the mental but that which eliminates individual idiosyncrasy through the prolonged "averaging" of viewpoints by communication.5 Scientific communication also lies near the heart of Gottlob Frege's conception of objectivity, his a priorisim as a metaphysical Platonist viewpoint, which Frege ascribed to a psychological treatment of logic because it would make scientific communication impossible: "Thus, I can also acknowledge thoughts as independent of me. Other men can grasp as much as I: I can acknowledge a science in which many can be engaged in research."20

Peirce and Frege bear philosophical witness to changes in scientific practice that brought corresponding changes in scientific ideals during the middle decades of the nineteenth century. The scale and organization of scientific labor grew and became more complex; more people with more diverse training were in more frequent contact than ever before. Science had been collaborative, at least in principle, since the seventeenth century22 and cosmopolitanism was the leitmotif of Enlightenment science.23 But the scientific province of the eighteenth-century Republic of Letters was not yet a scientific community in the modern sense: academies may have exchanged proceedings, and there were international collaborations like that which observed the transit of Venus in 1761, but the real communicative bonds were friendships (or enmities) between individual scientists, nourished by lifelong correspondences. These were highly selective bonds established between peers, and even if the relationship never progressed from pen-pals to face-to-face meetings, the correspondences often served as conduits to intimacy, with personal revelations strung among scientific findings.24 In contrast, the contexts that knitted together the nineteenth-century scientific world were at once more numerous, more heterogeneous, and more impersonal, although they never entirely displaced scientific friendships. For all the cozy Gemeinschaft associations of the term "scientific community," the actual relationships that wielded it together were increasingly narrow and formal.

But welded together it was, not only by invisible girders that stretched across national and linguistic boundaries in the form of international journals, commissions, and congresses but also by the elements that characterized levels of skill, status, and training within and among laboratories and observing stations. Accruals circled across oceans and continents; measurements were exchanged, observations tallied, instruments calibrated, units and categories standardized. This battle of scientific communication was in part made possible by better postal systems, railways, telegraphs, and the like, but it was not caused by these technologies. Nor was it simply the inevitable result of nature's uniformity enabling many scattered observers to compile notes on universal phenomena. There was nothing inevitable about communication science; it required hard work at every juncture: new instruments and new methods of data analysis were preconditions for amalgamating measurements made by far-flung observers;25 international conventions on time and longitude over the standards and definitions that would make the result of any experiment or theoretical research comparable.26 Scientific labor had to be divided and disciplined to equalize differences of skill and training.27 The very phenomena had to be purified and filtered, for some were too variable or capricious to travel well. Already in the eighteenth century, scientists had begun to edit their facts in the name of scientific sociability;28 by the mid-nineteenth century the construction of nature in the communicable had become standard practice among scientists. It
would be an exaggeration, but not a distortion, to claim that it was "scientific consciousness" that was the precondition for the uniformity of nature rather than the reverse. This is the context in which aperspectival objectivity because the creed of scientists, the ideal that corresponded to the practice of well-nigh constant, impersonal communication. As Holborn has argued, certain forms of quantification have come to be allied with objectivity not because they necessarily "agree more accurately" but because they serve the ideal of communica-
tibility, especially across barriers of distance and time. Aperspectival objectivity was the ethos of the interchangeable and therefore fungible observers-unmarked by nationalities, by society, by training, by tradition, byquirky appearances by colourful writing styles and so on. Disagreement that might interfere with the communication, comparison, and accumulation of results. Scientists paid homage to the intersubjectivity of the science with the self-effacing cooperation of scientists, who no longer came in the singular—as Pasteur did in his diaries, Ernst Haeckel in his epigons. Ernst Haeckel's essay, "Science, one soul," in Charles Darwin's Origin, Ernst Haeckel's admiration for the "more objective" word "soul," in which "one is transported to the viewpoint of humanity," over or philosophical, which confounds us, the subjective fact of the solitary thinker; it became clear among scient-
ists to write crudely impressionistic autobiographies, as is the case of Dewey and Harfield. Sub-
jectivity became synonymous with the individualistic and exclusive, objectivity, with the collective and universality. The ethos of aperspectival objectivity had arrived.

In order to appreciate the novelty of this ethos in science, we must contrast it with the ideals and practices that preceded it. Differences of perspective, literal and figurative, were often remarked upon by natural philosophers of an earlier period. Lucien Lévy-Bruhl, for example, wrote to the Royal Society of London that he and his son had disagreed about the size of some "black flakes of a Whale" observed under the microscope, and provided drawings illustrating both his and his son's views, which suggests the difference of our minds' sight from another. Disagreement between scientists and artists about what we see and how to draw it was com-
monplace in the science of the eye. And were a special case of the more widespread dis-
agreement between contemporaries and contemporaries. Far from diminishing the ideal of the 'interchangeable observers,' seventeenth- and eighteenth-century scientists carefully weighted observation reports by the skill and integrity of the observer. Edward Huyghen's complaint that many astronomical "merchants" "steal the Eye of those that are best qualified to give a good Account of them," and was scrupulous in valuing the quality of his own and others' observa-
tions of a solar eclipse. Reports of scientific findings, particularly in the empirical sciences but sometimes even in mathematics, were emphatically seen as the first-person singular, for the skill and character (and occasionally social status) of the reporter were often as crucial to judging its worth as its content. Scientific correspondents may have known one another personally in all cases, but they spoke each other's abilities and (erroneous) discussions with the same thoroughness and care that they would have applied to the credentials of a banker alone to be entrusted with a large sum of money. Even the testimony of an expert could not always trump the testimony of a trusted colleague when the Paris Académie des Sciences failed to replace Johann Bernouilli's glowing endorsements, even after repeated pleas that followed Bernouilli's instruction to the letter, Perpetual Secretary Fontenelle preferred to appeal to the "witness of nature" than to doubt an eminent witness's word. Conversely, many of contributive reports failed to move the Academie when the witnesses had low credibility in its eyes—for example, ultimate peasants observing meteorite falls.}

Set against this background, we can better appreciate why aperspectival objectivity did not...
figured prominently in eighteenth-century science. Improvisation communication and a refined division of scientific labour were the exception rather than the rule, and the ideal of the interchangeable observer would have exercised little attraction for observers proud of their own hard-won qualifications and alert to minute differences in the qualifications of others. We can also appreciate the high cost of the ideal of apetoretical objectivity and of the practices that eventually established it in the natural sciences. Nineteenth-century scientists still sometimes complained about the anonymity of international journals in terms their eighteenth-century predecessors would have understood; for example, in 1881 The Lancet reminded editors of their responsibility to "a certain number of readers, and especially those in foreign countries, who have no clue to the character of the author beyond the fact that they find his works in good company" in screening articles by contributors locally known to be "constitutionally incapable of selling the simple, verbal truth as to (their) observations and experiments." The distances and sheer numbers of writers and readers spanned by the new networks of scientific communication had undermined the old rules of trust and trustworthiness.

However, the principal casualty of the ideal and practices of apetirical objectivity was not trust but skill. Skill did not fit comfortably into the enlarged, collective science of the latter half of the nineteenth century, for at least two reasons: first, it was rare and expensive and therefore could not be expected of all scientific workers; and second, it could be communicated at best with difficulty, if at all. As science expanded in the middle decades, so did its need for labor, preferably cheap labor. However, cheap labor was usually badly educated labor (with the notable exceptions of scientists' wives and sisters), and Charles Babbage suggested that scientists follow the example of manufacturers in dividing tasks into their smallest, simplest parts to minimize the necessary scientific qualifications. Recounting how the French mathematician Poisson had formed out the computation of his logarithmic tables to reckoless who could only add and subtract, Babbage pointed out that since his labor "may almost be termed mechanical, requiring the least knowledge and by far the greatest exertions," it "can always be purchased at an easy rate." Babbage toured the accuracy of Poisson's human computer, and Claude Bernard thought "an uneducated man" would be a less biased recorder of experimental results, but there can be little doubt that the division of scientific labor altered the nature and distribution of scientific skill. The interchangeable observer was all too often the lowest common denominator observer. As Babbage himself remarked with characteristic whimsy,

genius marks in trace, not by the observation of quantities insusceptible to any but the scurvy senses, but by placing nature in such circumstances, that she is forced to recur to minute variations on so magnified a scale, that an observer possessing ordinary faculties, shall find them highly written."

In short, skill was too aristocratic a trait for a democracy of scientific observers, where democracy carries the Tocquevillean associations of mediocrity.

Skill was also notoriously inflexible, as Zeno SWJtink has praised out, and therefore increasingly suspect among scientists who equated objectivity with communicaibility. Georges Cuvier expressed some of this discomfort in his essays of physiologist celebrated for their clinical care for the causes of their cases were insusceptible to all who were unable to "penetrate [the physician's] most intimate thoughts... or be present at his sudden inspirations." This discomfort had become acute by the time the physiologist Etienne Jules Marey launched his campaign to replace the human senses with recording instruments. The advantage of fast example, the sphygmometer over the human pulse reader was not only that it leveled individual differences in
sensory sharpness and clinical tact—a relative generation (or a low-paid technician or nurse) could fill in for the experienced physiologist or doctor. It was also that the sphryngometer and other self-insulting instruments could convey results which language could not. What good was the exquisite skill of the practiced pulse reader in science, quoted Morley, if he could not communicate in: "How can be here, by definition or map, to make the nature of a case sensation comprehensible to others?" The problems of communicating skill and judgment acquired through long experience were not peculiar to medicine: astronomers and other observers also increasingly turned to statistical methods, the more mechanical the better, to standardize their results in a form immediately accessible to others. The net result was often a lack of reliable information that had previously been an integral part of the observational record—whether the observer was suffering from a bad cold, whether the telescope was warped, whether the air was choppy—but information was particular to persons and places to conform to the structure of epistemological objectivity.

CONCLUSION: THE MORAL HISTORY OF OBJECTIVITY

I hope I have by now made at least that much plain concerning the history of epistemological objectivity: first, that it does not constitute the whole of objectivity; and that its relationships with other aspects of objectivity (for example, the ontological) are conceptually and historically problematic; second, that its first conceptual home was in aesthetics and metaphysics, not the natural sciences. Unlike these current associations third, that when it did erode in science in the mid-nineteenth century, it did so because of very change in the organization of science, both at a global and local level, and fourth, that the adoption of epistemological objectivity as a scientific ideal was not without its cost. These points are not meant to suggest how the metaphysics of science was being the other means of objectivity into a single, comprehensive concept. Why, for example, should public knowledge—observations more easily communicated to other specialists by many people as possible—become philosophical than to being the other means of objectivity into a single, comprehensive concept? Why, for example, should public knowledge—observations more easily communicated to other specialists by many people as possible—become philosophical than to being the other means of objectivity into a single, comprehensive concept? Why, for example, should public knowledge—observations more easily communicated to other specialists by many people as possible—become philosophical than to being the other means of objectivity into a single, comprehensive concept?

I would like to conclude with a reflection about the moral import of epistemological objectivity. No one familiar with past and present literature can overlook this dissembling, admiring tone. For the authors, there is a certain nobility in the abandonment of the personal, a sacrifice of the self for the collective—of not for the collective good, at least for the collective comprehension. It should be noted that there are many other grounds for moral applause than those of Adam Smith and the eighteenth-century moral philosophers. Although the same terms "impartiality" and "impersonality" are often invoked, science, it will be remembered, combined science and mathematics with a certain admixture of indifference to public opinion, secure in the knowledge that their work would ultimately be recognized as its true worth. They were immune to the vagaries of contemporary criticism. The detachment required of sciences by epistemological objectivity was considerably more severe: some scientists must not only want to be recognized, they must now give up recognition altogether. Robert Oppenheimer captured the self-damaging import of epistemological objectivity:

"[The scientist's] goal is not to be made, but to influence one another in the joint effort... The life of the scientist
can be summarized in two or three results, whose expression will occupy but a few lines or disappear completely in more advanced formulations.33

Claude Bernard exhorted scientists to bury their pride and vanity in order "to unite our efforts, instead of dividing them or nullifying them by personal disputes,"34 for all scientists are ultimately equal in their anonymity:

In this fusion (of particular truths into general truth), the names of promoters of science disappear little by little, and the further science advances, the more it takes an impersonal form and detaches itself from the past.35

There is no doubt that these and kindred statements bespeak a high-minded ideal rather than a sociological reality: scientists may have given up writing in the first-person singular, but not signing their articles. There is also some justice in the accusation that in so burying their individual identities in the impersonal collectivity, scientists actually aggressize rather than surrender their social and intellectual authority. But this is not the whole meaning of the self-denying demands of aperspectival objectivity. Even values honoured only in the breach are nevertheless genuine values, reflecting choices and revealing attitudes. Moreover, the values of aperspectival objectivity left visible traces in the conduct of scientists, in their ever stronger preference for mechanized observation and methods, in their ever more refined division of scientific labour, and in their ever more exclusive focus on the communicable. It would be difficult to explain the force of these values by appeal to either rationality or self-interest alone, and equally difficult to deny that aperspectival objectivity never shook off all traces of its origins in moral philosophy. In the self-denying counsels of aperspectival objectivity there still reverberates the stern voice of moral duty, and it is from its moral character, not from its metaphysical validity, that much of its force derives. The values of aperspectival objectivity are undeniably curious ones, and may well be of dubious merit. But moral values they undeniably are, and we must take this into account when we try to explain how our current confused usage of objectivity came to be. The history of objectivity is an intellectual and a social history, but it is a moral history as well.

NOTES
This work was supported by U.S. National Science Foundation Grant No. DFR-8507569. I would like to thank Peter Dear and Theodore Porter for comments on an earlier version of this paper.
5. Nagel, Viva, pp. 4-5.