Epilogue

Windows, Mirrors, and Beads

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Our understanding of translation has not been well served by glassy metaphors. The transparency of the window renders the contributions of the translator opaque; the reflection of the mirror misses the refraction of the original text through new contexts; texts rendered word-for-word like single beads strung into a necklace break up the sense of the whole. The essays in this volume instead appeal to other families of metaphors: those of movement, transformation, and assimilation. Taken together, these alternative metaphors offer a fresh understanding not only of translation but also of intellectual tradition and perhaps experience itself.

Metaphors of movement evoke the root meaning of translation as translocation: a translated text is going somewhere, and the destination matters. Just as the contents of a suitcase packed for a vacation on the beach differ from those of one packed for a business trip to a city, Avicenna translated for a twelfth-century Andalusian readership goes light on the logic and mathematics that a thirteenth-century Parisian Master of Arts might in contrast find riveting (Bertolacci); a treatise on medical dietetics originally written in eleventh-century Baghdad might swap out ingredients and recipes when translated for a fourteenth-century northern Italian audience (Olariu). More medically inclined translators of Maimonides's logical treatise into Hebrew tended to emphasize the role of experience in logic, a bow to the central role of experience in medical reasoning (Halper). Failure to adapt to the destination can end in mutual incomprehension, as in the case of the cool reception Chinese scholars gave to Matteo Ricci's attempt to translate the memorization of Chinese characters into the mnemonics of memory palaces (Jin).

But a modern reader primed by the Whorf hypothesis of languages as worldviews and organicist conceptions of culture might be surprised by how few such moments of mutual incomprehension emerge in these premodern case studies—much less philosophizing about mutual incomprehension (Harvey). It's not that there weren't plenty of opportunities for translational perplexity: how, for example, to translate the ancient

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Greek word that means both "flavor" and "humor" into Latin and Arabic, which require a semantic distinction between the two (Panarelli), or the Latin *ingenium* into various medieval and early modern European vernaculars, each with its own distinctive vocabulary of mental processes (Morton)? The resulting slippage and imprecision jar the ear of modern scholars (who are themselves able translators of many tongues, as these essays show to good advantage) and nowadays occasion meditations on the incommensurability of languages and cultures. Yet although premodern translators were certainly aware of these difficulties and strove for accurate translations, their understanding of "accurate" is not synonymous with our understanding of "precise."

The accolade "accurate" always begs the question, "accurate for what purpose?" For example, early modern artisans being taught the rudiments of geometry by Albrecht Dürer did not aspire to Euclidean standards of rigor as they struggled to impose form on recalcitrant matter, any more than sixteenth-century botanical illustrators aspired to the extreme mimesis of still life paintings of the same period (Remond). "Accuracy" was always judged implicitly with a goal and audience in mind: the compact tables that summarized medical therapies for the use of busy people with neither the learning nor patience for long-winded discourses (Weil) were accurate enough for their intended readers, even if too abbreviated for professors of *medica theorica*. Translations judged by standards of accuracy are suppler—and more context-sensitive—than translations that aim for precision. The latter evolve in tandem with the creation of specialized technical vocabularies that anchor words to definitions and place a premium on consistency. Many premodern discourses in philosophy, mathematics, theology, and astronomy did evolve such vocabularies—to the point that expert readers like Roger Bacon could complain about earlier slipshod translations (Polloni), a sign that fine distinctions and nuances that had not mattered to earlier readers now interested those schooled in the latest specialist debates. Translations travel among epochs as well as cultures, and translations that were accurate for one period may need to be later replaced by translations in the same language: the destination has shifted. In contrast, precise translations crystallize a vocabulary that endures because it is reinforced by a tradition passed on from master to student across generations. Astronomical tables and the technical vocabulary that elucidated them proved astonishingly long-lived and mobile (Geller, Hsia).

Transformation is obviously related to translocation as a form of "transculturation" (Dupré). Texts that travel must adapt to foreign locales just as human travelers do. Avicenna's gloss on Aristotle's evidence that fish can hear transforms the Greek original—people who live near the sea attest to this—into the more generic and epistemologically more forceful Arabic phrase "people of experience." Avicenna and his readers had a general category of expert witnesses that fortified the authority of Aristotle's more casual report (Alpina), a subtle but epistemologically significant change. Other transformations are more literal: the text changes

form. Prose is pulverized into tables for handy consultation (Weil); qualitative medical concepts such as the viscosity of humors are more or less arbitrarily quantified to conform to new Newtonian criteria of mathematical certainty (Reed). These two examples of shape-shifting involve deliberate abridgement of, on the one hand, a long medical treatise, and, on the other, the "too-muchness of experience" (Park). These are epistemic strategies familiar from mathematical idealization and modeling, in which many small perturbing factors are deliberately ignored in the hopes of isolating a few big causes or a persistent regularity, as Galileo deliberately discounted air currents and friction in his geometric account of free fall. But mathematics need not be involved in such attempts to separate signal from noise: privileging the outlines of plants over their colors can serve the same goal of focusing attention on essential morphological features over variable ones (Remond).

Occasionally, transformation can take the form of adding rather than subtracting meaning. To insert alchemical symbols into natural philosophical or theological texts thickens accounts of the four bodily humors or death and resurrection with additional layers of association and interpretation (Carlotta). Argumentative techniques of reasoning by analogy from the observable to the unobservable (for example, the nature of God in medieval Islamic theology) similarly enriches both terms of the analogy with new associations (Erlwein). Similarly, to infer the sublime craftsmanship of God's creation from the anatomy of an insect examined under the microscope exalted the humble insect to new levels of dignity and significance in early modern Protestant natural theology.

But do such transformations really count as translations except in the loosest metaphorical sense? The answer depends, first, on how narrowly the practice of translation is confined to language, and second, on the degree to which the competing cluster of glassy metaphors with which I began is allowed to define what legitimate translation is and should be. The import of many of the essays in this volume is that translation among languages is paradigmatic of a larger class of practices that extend the realm of the intelligible by going beyond what is given in either a text or the world: "epistemic translation" (Krause with Auxent and Weil). On this understanding, commentary on a text in the same language would be an act of translation, as would diagnostic inferences from observed symptoms to a hidden disease. Implicit in this broad-church construal of translation is the assumption that the cognitive practices involved in translating *sensu strictu* have something in common with analogizing, commenting, tabulating, and quantifying: in short, with interpretation. All of these activities require that the translator rethink, not just render the text.

Interpretation of any sort is exactly what the glassy metaphors of translation—and of scientific experience—combat. Suspicion of the ways in which the infirmities of the human mind and senses, individual biases, theoretical blinders, and even language itself—Francis Bacon's idols of

the tribe, cave, theater, and marketplace—can distort the understanding of nature are rife in the reformed natural philosophy of the seventeenth century (Auxent). Ideally, the human mind should patiently mirror nature, not leap to premature conclusions based on scanty evidence and wishful thinking: the Interpretation of Nature comes only at the very end of Bacon's grand scheme for the renovation of natural philosophy. It is perhaps not an accident that suspicion of premature interpretation in natural philosophy was preceded by over a century of humanist suspicion directed toward medieval translations, both Arabic and Latin, of ancient texts. In both cases, a sudden eruption of new sources—the Greek manuscripts brought to Italy and elsewhere after the fall of Constantinople after 1453, the discoveries of new peoples, flora, and fauna by voyages of exploration to the Far East and Far West—forced European scholars to reexamine everything they thought they knew, and how they knew it. The result was an efflorescence of new translations and dictionaries in both Latin and the vernacular that brought unprecedented scrutiny to the act of translation itself, and also of new inquiries into natural history and natural philosophy that brought unprecedented scrutiny to the act of inquiry itself. In both philology and natural philosophy, it was a moment of acute awareness of past error—and therefore a moment of extreme epistemological caution.

This is the context in which glassy metaphors of both translation and scientific experience became predominant: the translator or naturalist as transparent window or faithful mirror; words or facts as atomized beads deliberately excerpted from the flow of prose or experience, respectively. All of these metaphors highlight the dangers of interpretation, of mingling text and context, observation and theory. They articulate the suspicion of hermeneutics that lives on in almost all epistemology, especially the positivist variety. Because both metaphors and epistemology have become so predominant, it is especially difficult to recover the third cluster of alternative metaphors, assimilation, which is as relevant to experience as it is to translation.

In contrast to the singular sense datum of Enlightenment sensationalist psychology and positivist epistemology, Aristotelian experience was multiple and layered, as much the product of memory and judgment as it was of perception. Experience resulted from the accretion of many sensory particulars that coalesced into universals in the mind, as individual soldiers routed in battle reconstitute a line when one after another turns and stands firm, in Aristotle's famous analogy from Book II of the *Posterior Analytics*. For Aristotelians, true knowledge is knowledge of universals, not particulars—just as true knowledge of a language is knowledge of common, not proper nouns. Experience itself is a palimpsest of countless perceptions, sedimented in memory and ordered by judgment into universals.

The mental processes that generated experience in the individual had their direct counterpart in the processes of "domestication and

assimilation" (Krause with Auxent and Weil) by which the knowledge of experience was preserved and transmitted across generations and cultures. It too was a palimpsest of many minds and voices that accreted over time in the form of translations, commentaries, and, above all, in-person teaching (Krause). Quite aside from the imperatives of preserving texts written on fragile media from the ravages of time, there was the need to transmit the secondary knowledge needed to understand and build upon them, especially as access to both ancient languages and ancient contexts faded. These imperatives still govern the modern knowledge economy. Every discipline, including the empirical sciences, is utterly dependent on the work of others preserved in texts; these texts have a material form that must be preserved, whether in a library or on a server; the continuity of scholarship and science is guaranteed for only as long as a next generation can be trained to carry on. But whereas moderns since the advent of printing, and *a fortiori* since the advent of the internet, dread the surfeit of knowledge—too many books, too much data—premoderns dreaded dearth—texts that survived only in fragments or not at all, observations too costly and difficult to make except on rare occasions, codices so rare that they were chained to lecterns, reports of foreign climes and past epochs that were few and unreliable.

In an economy of dearth, the husbanding of resources takes precedence over pruning them. Experience, both first- and secondhand, accumulates in texts as sense impressions do in memory: *historia* supplements *autopsia* (Chase). Because of the emphasis on collection, preservation, translation, and transmission, the line between textual and sensory experience in premodern natural history and natural philosophy was a blurred one not just in practice (as it still is in modern science) but also in principle. Seventeenth-century reformers such as Francis Bacon might have drawn a principled distinction between reliable forms of empiricism and unreliable textual authority, but in practice, Bacon himself indiscriminately mixed together his own observations, those made by others, and excerpts from his reading (including Pliny's much-reviled *Historia naturalis*) in his unfinished natural history, the *Sylva sylvarum* (1627).

Despite all the scorn heaped on bookish learning by seventeenth-century reformers of natural knowledge, they (and their modern successors) were as dependent—indeed, more dependent—on the collective empiricism made possible by the circulation and accumulation of texts. Imagine science pursued in splendid solitude, with neither library nor internet. Descartes was perhaps the last natural philosopher to contemplate deducing all of natural philosophy from first principles, and even he soon gave up on that project. As he explained in the *Discours de la méthode* (1637), he would need research assistants, lots of them—just as Bacon imagined a large research staff of explorers, experimenters, and "depredators" of texts in his utopian fragment, the *New Atlantis* (1627). What distinguished Bacon and other reformers who called for a new kind of empiricism was their deep distrust of exactly the processes of assimilation so characteristic

of Aristotelian experience and premodern translation: the smooth process by which sensations sedimented in memory crystallized into universals, and the equally smooth process by which translators tailored texts to new audiences and new uses. In the eyes of their critics, these processes of assimilation, as natural but also as transformative as digestion, of making the nature and texts one's own, were a dangerous source of error. The proposed remedy was methodological guardrails to keep erring intellect on track: "precise norms governing the use of experience in the making of scientific knowledge" (Cohen-Cole).

We moderns are still heirs to their critique and to the glassy metaphors it spawned, although the critique has never been without its own critics. What experience is and how it can be made scientific is still a philosophical battleground. But this exploration of premodern scientific experience in translation revives alternative metaphors that are still very much alive in practice, if repressed in principle. Every intellectual tradition, modern or premodern, depends on the chain of teachers and students to reanimate the accumulated experience of past generations, much of it in translation, in the speaking voices of the classroom, the laboratory, the observatory, and the field. There, experience is still being translocated, transformed, and assimilated for the next generation of students. The glassy metaphors of experience and translation that appeal to the seeing eye are deaf to the speaking voices that insure that science and scholarship will go on.