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Source: *Rhetorica: A Journal of the History of Rhetoric*, Vol. 28, No. 3 (Summer 2010), pp. 261-289

Published by: University of California Press on behalf of the International Society for the History of Rhetoric

Stable URL: <http://www.jstor.org/stable/10.1525/rh.2010.28.3.261>

Accessed: 04-02-2018 16:47 UTC

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Abstract: This essay offers “material rhetoric” as a new addition to the usual list of categories used to describe rhetoric in the eighteenth century (neoclassical, belletristic, elocutionary, epistemological/psychological) by examining the material elements of treatises written by Joseph Priestley and Gilbert Austin. Those material elements—namely heat, passion, and impression—are tracked through Priestley and Austin’s scientific writings, thereby positioning their particular strains of material rhetoric as legacies of philosophical chemistry.

Keywords: Joseph Priestley, Gilbert Austin, *Chironomia*, material rhetoric, rhetoric of science, belletristic rhetoric, eighteenth-century rhetoric

Recent efforts to consider the roles of bodies and materiality in rhetorical theory have encouraged rhetorical scholars to bracket the privileged place granted to reason, rationality, and their locus—the mind—by neo-Aristotelian and Enlightenment thinkers. Doing so, each of us argues elsewhere, as do Sharon Crowley and James Fredal, allows us to develop a more expansive conception of what rhetoric is and does.¹ For starters, a focus on bodies may

We would like to thank Mike Edwards, John Marsh, Carol Poster, Ted Underwood, and the anonymous reviewer for their roles, variously, as readers, sounding boards, and also for strengthening the ideas and writing herein.

¹Cory Holding, “Affecting Rhetoric,” *College Composition and Communication* 59.2 (December 2007): 317–29; Debra Hawhee, “Somatography,” *Quarterly Journal of Speech* 93.3 (2007): 365–74; Sharon Crowley, *Towards a Civil Discourse: Rhetoric and Fundamentalism* (Pittsburgh: The University of Pittsburgh Press, 2006), 24–57; James Fredal, *Rhetor-*

Rhetorica, Vol. XXVIII, Issue 3, pp. 261–289, ISSN 0734-8584, electronic ISSN 1533-8541. ©2010 by The International Society for the History of Rhetoric. All rights reserved. Please direct all requests for permission to photocopy or reproduce article content through the University of California Press’s Rights and Permissions website, at <http://www.ucpressjournals.com/reprintInfo.asp>. DOI: 10.1525/RH.2010.28.3.261.

draw us to new or under-considered texts, or it may bring to the center thinkers who have otherwise remained on the margins of reason, left to the side in favor of others who fit more neatly into existing historical trajectories. Two such thinkers are Joseph Priestley (1733–1804)—who is surprisingly underrepresented in current rhetorical scholarship despite weighty contribution to rhetorical theory during the Enlightenment—² and Gilbert Austin (1753–1837), who by *Chironomia* (1806) wished “to dispel a ‘strange prejudice’ against rhetorical delivery, especially against gesture and bodily action,” and affected the teaching of delivery (especially in America) well into the present century.³ While not strangers to rhetorical scholars, these thinkers are more often than not in the history of rhetoric footnoted or subordinately cloused to eighteenth- and early nineteenth-century luminaries Campbell, Blair, Smith, and Whately.

And yet as we will argue, Priestley and Austin have much to offer a history of rhetoric that pays particular attention to materiality. As we see it, there are at least two ways to account for the scant scholarly attention given to Priestley and Austin as theorists of rhetoric. The first involves a retroactive positing of disciplinary distinctions such that rhetoric can be aligned with philosophy or with literature, but less easily so with the more scientific, experimental areas of chemistry and psychology.⁴ Second (relatedly) is the associated casting of rhetoric on a stage of ideas, as a set of immaterial, disembodied concepts or principles that, once learned or performed,

ical Action in Ancient Athens: Persuasive Artistry from Solon to Demosthenes (Carbondale: Southern Illinois University Press, 2006), 134–56.

²Ann George, “Grounds of Assent in Joseph Priestley’s *A Course of Lectures on Oratory and Criticism*,” *Rhetorica* 16.1 (1998): 81–109 (p. 81). She credits Priestley with helping to advance new or belletristic rhetoric, and writes, “Vincent Bevilacqua calls Priestley ‘one of the great voices of the eighteenth century Enlightenment.’ William Samuel Howell considers Priestley important because ‘he became the first rhetorician of his time to establish a new theory of rhetorical structure,’ a structure most notably used in the Declaration of Independence.”

³Mary Margaret Robb and Lester Thonssen, Editors’ Introduction, *Chironomia: Or, a Treatise for Rhetorical Delivery*, by Gilbert Austin (Carbondale: Southern Illinois University Press, 1966), ix.

⁴To be sure, a number of works examine the rhetoric of science during the long eighteenth century. See, for example, Peter Walmsley, *Locke’s Essay and the Rhetoric of Science* (Lewisburg, PA: Bucknell University Press, 2003); M. D. Eddy, “The Rhetoric and Science of William Paley’s *Natural Theology*,” *Literature and Theology* 18.1 (2004): 1–22; Alan G. Gross, “Rhetorical Imperialism in Science,” *College English* 55.1 (January 1993): 82–87, and the texts reviewed therein. This article continues those integrative efforts, but we also mean to replace the “of” in rhetoric of science with a bi-directional “and.”

become something other than rhetoric—i.e., good preaching, or effective campaigning. Yet upholding bodies and material as always counter to reasoned, cerebral argument risks eclipsing relevant disciplinary approaches—like those of psychology and chemistry—that have a good deal to tell us about bodies and materiality. We would be hard pressed, for example, to think of a discipline more thoroughly devoted to both materiality and reason than chemistry. And psychology, a discipline built around the very category of the mind, more often than not attends to bodily matters as well. This essay examines the peculiar and sometimes surprising ways that new material practices of chemistry and psychology crept in to theories of rhetoric during the eighteenth century, paradoxically loosening the grip of reasoned rhetoric and enlivening the bodies of rhetors—and importantly—their audiences.

By examining Priestley and Austin as theorists of material rhetoric, and by doing so through a transdisciplinary analysis of their experiments and their rhetorical theories, we hope also to join an ongoing effort to re-enliven eighteenth-century rhetoric.⁵ For most scholars in this area, the major movements of rhetorical theory number about four: neoclassical, elocutionary, belletristic, and a fourth that is referred to variously as philosophical, “psychological-philosophical,” or epistemological.⁶ George’s article on Priestley,

⁵Leading this effort is historian of rhetoric Carol Poster, whose editorial selections from *The Elocutionary Movement* form a seven-volume resource for those working in the field. Carol Poster, ed., *The Elocutionary Movement* vols 1–7 (Bristol, England: Thoemmes Press, 2003). A renewed interest in delivery also points scholars to the (long) eighteenth century and the elocutionary movement; see, for example, Philippa Spoel, “Rereading the Elocutionists: The Rhetoric of Thomas Sheridan’s ‘A Course of Lectures on Elocution and John Walker’s Elements of Elocution,’” *Rhetorica* 19.1 (2001): 49–91 (p. 53); and Michael Shortland, “Moving Speeches: Language and Elocution in Eighteenth-Century Britain,” *History of European Ideas* 8.6 (1987): 639–53. Rhetorician Sara Newman is exploring connections between medicine and rhetoric during the eighteenth and nineteenth centuries. See her “‘Study of Several Involuntary Functions of the Apparatus of Movement, Gripping, and Voice’ by Jean-Marc Gaspard Itard (1825),” *History of Psychiatry* 17.3 (2006): 333–39. See also Paul Goring, *The Rhetoric of Sensibility in Eighteenth-Century Culture* (Cambridge: Cambridge University Press, 2005).

⁶James L. Golden and Edward P.J. Corbett, *The Rhetoric of Blair, Campbell, and Whately* (Carbondale: Southern Illinois University Press, 1990), 12–16; H. Lewis Ulman, *Things, Thoughts, Words and Actions: The Problem of Language in Late Eighteenth Century British Rhetorical Theory* (Carbondale: Southern Illinois University Press, 1994), 4–5; George, “Grounds of Assent,” cited in n. 2 above, pp. 81–82; Michael G. Moran, *Eighteenth-Century British and American Rhetorics and Rhetoricians: Critical Studies and Sources* (Westport, Connecticut: Greenwood Press, 1994), 1–8. Moran adds two cat-

whose rhetoric typically falls in the last category, concludes by showing the costs of such rigid categorization. By taking these categories as given, “we miss what Priestley acknowledged but rhetorical histories too often do not: that ideas of language are culturally situated and necessarily have material causes and effects.”⁷ George concludes that “philosophical categorization not only partly decontextualizes but also depoliticizes rhetoricians, their texts and, ultimately, histories of rhetoric; it keeps hidden the materiality of rhetoric.”⁸ In this spirit, we offer an additional category—namely material rhetoric, whose theory moves “down body” from the other categories, taking as parameter the stuff that necessitates and facilitates rhetorical exchange, centering on suasion’s matter. While such a category would be more disruptive than neatly additive, for as we show, it cuts across at least two of the major divisions (the elocutionary and philosophical-psychological epistemological), it would answer George’s call for attending to 18th-century rhetoric’s materiality *and* make a place in the histories for theorizing how rhetoric works to change the body and mind constitutively. It would also bring into the story rhetorical theorists often passed over for not aligning with the traditional caricature of Enlightenment rhetoric, like Priestley and Austin—who use science to advance robustly materialist rhetorics in which the body and mind mutually define and co-constitute, and in which persuasion moves by and locates in hands, skin, nerves, veins.

In offering Priestley and Austin as two theorists of material rhetoric—two case studies—we hope to launch a conversation about the usefulness of going beyond asserting the fact of rhetoric’s materiality and beginning to more deliberately theorize rhetoric’s material components. Such a move may well require us to think beyond rhetoric’s sibling arts of literature and philosophy, with their shared concern for language, and to other, less obviously related fields of study. As this essay demonstrates, Priestley and Austin’s rhetorical theories mingle with the scientific ones in which they were expert, thereby reflecting practices of universal inquiry and philosophical scientific methodology and bringing material science literally into their rhetorics. This mingling, we argue, shifts existing conceptions of classical principles and canons, allowing a focus on stylistic elements befitting appeals to passion *and* to reason; and the transmission

egories to the usual four: “stylistic rhetoric” (pp. 2–3) and “women’s rhetoric” (p. 8).

⁷George, “Grounds of Assent,” cited in n. 2 above, p. 109.

⁸George, “Grounds of Assent,” cited in n. 2 above, p. 109.

of those appeals. Such a consideration more than augments the matter of rhetoric, drawing to rhetoric's domain the likes of air, heat, water, electricity, and vibration. It urges historians and theorists of rhetoric to address the body as well as the mind—to consider in addition to modes of argument lines of affect and swells of passion, and in addition to enthymemes and topics, heat and impression. In coming sections, then, we will read Priestley and Austin alongside their respective treatises on rhetoric in order to underscore a strain of materialist, affective rhetoric infused by philosophical chemistry.

THE MATERIAL SCIENCES

As historian of science Jessica Riskin makes strikingly clear in her study of sensibility and science during the mid-eighteenth century, in France, the commitments of early modern empiricists were not so severely restricted to mind-bound reason as we might assume from our post-Enlightenment vantage. Indeed, John Locke's sensationist epistemology, which traffics thinking through the bodily senses, effortlessly evolved into "sentimental empiricism"—a term Riskin uses to describe the extent to which the methods of the hardest sciences, especially physics and chemistry,⁹ were "founded on the assumption that knowledge grew not from sensory experience alone, but from an inseparable combination of sensation and sentiment."¹⁰ And the implications of this sense-based, or even sentimental empiricism were still being explored decades later by the likes of Priestley, a devotee of psychologist David Hartley, who argued against the ephemerality of both ideas and feelings and in favor of their stark physicality—their sticky, connective formation through chains of sensory associations. Riskin's work can thus go a long way toward disrupting a popular assumption among historians of rhetoric that Enlightenment thinkers were drunk on disembodied reason.¹¹

⁹Jessica Riskin, *Science in the Age of Sensibility: The Sentimental Empiricists of the French Enlightenment* (Chicago: The University of Chicago Press, 2001), 7.

¹⁰Riskin, *Science in the Age of Sensibility*, p. 15.

¹¹Perhaps Foucault's narrative about the grip that reason, system, and order had on the Enlightenment deserves at least partial credit for the popularity of this focus. Of course, scholars of eighteenth-century culture know better, and belletristic rhetoric arguably contains (in both senses) the category of sensibility in histories of rhetoric. Even so, David Hume's critiques of reason loom large. See for a view of Hume and literature, Adela Pinch, *Strange Fits of Passion: Epistemologies of Emotion, Hume to Austen* (Stanford: Stanford University Press, 1996).

Most treatments of Joseph Priestley as rhetorical theorist note that Priestley is of course best known as a chemist, especially for the discovery of oxygen and development of methods to carbonate water, and so associate his rhetoric with the scientific reverence of cool rationality as means to establishing claims. This association is fair to the extent that he suggests throughout his rhetorical treatise that the orator ought to draw on the smooth and plain resources of logicians and geometers for help with demonstration and proof.¹² Yet as George notes in her analysis of Priestley's *Course of Lectures on Oratory and Criticism*, for all Priestley's attention to rational argument, the section on style "retreats from the grand, universalizing appeal of reason and offers a more psychologically complex, reader-based account of how discourse works,"¹³ thereby giving way to a strong emphasis on passion and imagination—categories that, for Priestley at least, turn out to be quite physical. As George's article demonstrates, Priestley's surprising stress on passion and imagination is less surprising when considered alongside David Hartley's theories of associationism. We propose to probe that relationship further as we read the scientific experiments of Priestley alongside his treatise on rhetoric.

Austin's scientific interventions, in contrast with Priestley's, are more modest in aim and scope. While Priestley's science focused on harnessing and transmitting gases, electricity, and other elements, Austin focused mostly on refining the equipment used in pneumatic chemistry, in order to achieve the most effective and efficient transmission of, say, gas to water. Whereas Priestley's scientific publications number in the hundreds and documented his primary vocation, Austin's number four, and their composition often took a back seat to his other avocations: three relatively new apparatuses—one for "impregnating water," one for "transferring gasses over water or mercury," and one glass condenser; a fourth depicts Austin's "Method of Cutting Very Fine Screws." Three of his four published scientific articles labor to improve established methods for transmitting fixed

¹²Joseph Priestley, *A Course of Lectures on Oratory and Criticism* (London: 1777), ed. Vincent M. Bevilacqua and Richard Murphy (Carbondale: Southern Illinois University Press, 1965). See, in particular, Lecture VII, p. 42: "For, in all science, we either proceed from particular observations to more general conclusions, which is *analysis*; or, beginning with more general and comprehensive propositions, we descend to the particular propositions which are contained in them, which is *synthesis*." Geometry is discussed on p. 45, and in Lecture VIII, p. 51: "Of the Several parts of a proper Demonstration."

¹³George, "Grounds of Assent," cited in n. 2 above, pp. 103–04.

air into water—a process, of course, first developed by Priestley.¹⁴ Austin's contribution to the history of rhetoric, however, is arguably more innovative than Priestley's. So far the only attempt to read Austin's treatise on delivery, *Chironomia*, in light of his scientific experiments has been made by Philippa Spoel, who, beginning from Foucault's premise that the eighteenth and nineteenth centuries had given themselves over to "the order of things," settles on a reading of Austin's elaborate gesture-notation system as encoding a robust and productive "science of bodily order."¹⁵ Spoel reads the treatise's diagrams as participating in the same efforts Foucault ascribes to the periodic table—"an exhaustive ordering of the world."¹⁶ While Foucault's perspective gives Spoel a framework for making intelligible Austin's coded system, it requires her to concentrate on the logic of notation and the role of tables and plates in the book. What results is a reading of Austin's system as highly reasoned, heavily scientific, and meticulously ordered. Such a reading risks overlooking the book's steady theoretical reflection on bodily passions, which Spoel argues "hovers on the periphery of the system, disturbing its cool logic and neat divisions."¹⁷ Our reading, in contrast, offers that bodily passions are the very *raison d'être* of Austin's system, and that the text of *Chironomia* contains a theory of rhetorical transmission deriving as much from Austin's research in philosophical chemistry as it does from his eighteenth-century systematic.

¹⁴Fixed air is what we call carbon dioxide; it is about one and a half times as dense as air and is water-soluble.

¹⁵Philippa M. Spoel, "The Science of Bodily Rhetoric in Gilbert Austin's *Chironomia*," *Rhetoric Society Quarterly* 28.4 (1998): 5–27 (p. 7). In their introduction to the 1966 reissue of Austin's treatise, Robb and Thonssen usefully (and aptly) both predict and urge a focus on the images and notations: "The reader will probably look first at the steel engravings which illustrate the book." They explain that Austin's system of gesture and movement is based upon the speaker's position in an imaginary sphere, and that notations are made to indicate changes of position, especially of the arms as they move in the sphere. The notations for arms, hand, and head are placed above the line of literature to be read, and the movement about the stage indicated below; for example, AR2 means that the speaker advances two steps to the right (Austin, *Chironomia*, cited in n. 3 above, pp. ix–x).

¹⁶Spoel, "The Science of Bodily Rhetoric," p. 7; M. Foucault, *The Order of Things* (New York: Vintage Books, 1994), 74.

¹⁷Spoel, "The Science of Bodily Rhetoric," cited in n. 15 above, p. 24.

HEAT AND PASSION

Passion figures prominently in Priestley's and Austin's treatises on rhetoric. They are each especially attuned to how passion wells up in the rhetor—both during the inventional phase of composition and in the reading or delivery of that composition. Passion often suggests a kind of intensity; its presence is indicated physically by motion and an increase in temperature, and it moves a discourse beyond the reason-bound goal of informing. In Priestley's *Course of Lectures on Oratory and Criticism*, a direct discussion of passion does not appear until Priestley has made a distinction between informing and affecting, as he does in this treatment of amplification:

*A narration or description is concise, when only a few of the most important particulars are mentioned, and amplified and enlarged by a more minute detail. The former is sufficient, where it answers a writer's purpose barely to inform his reader of the reality of an event; the latter is necessary, if he be desirous that the reader be interested in it, and affected with it.*¹⁸

The distinction between informing and affecting makes room for the category of passion, and indeed, affecting edges toward the suasive, as evident in the above passage where one's being "affected with" a discourse is opposed to being informed. Here, then, the category of affecting parallels the much older category of moving, as in Augustine's observation (based on the Romans) that the three aims of rhetoric are to "instruct, delight, and move."¹⁹ The category of moving also surfaces in the rhetorical writings of Priestley's contemporary George Campbell, who observes that "all the ends of speaking are reducible to four; every speech being intended to enlighten the understanding, to please the imagination, to *move the passions*, or to influence the will."²⁰ At stake in Priestley's distinction between informing and affecting is the argument's liveliness, its ability to somehow move—or at least move in with—the audience. To "inform" readers of something is to remain in the confines of facts, and Priestley's adverb "barely" suggests a sparseness of purpose, whereas to "affect" readers with something is to move beyond those confines and effectively

¹⁸Priestley, *A Course of Lectures*, cited in n. 12 above, p. 28, emphasis in original.

¹⁹Saint Augustine, Bishop of Hippo, *De Doctrina Christiana*, ed. and trans. R. P. H. Green (New York: Clarendon Press, 1995), 117.

²⁰George Campbell, "The Philosophy of Rhetoric," in James L. Golden and Edward P. J. Corbett, eds., *The Rhetoric of Blair, Campbell, and Whately* (Carbondale, IL: Southern Illinois University Press, 1990), 145; emphasis added.

to move readers or listeners to a new place. The continuum quickly slides from fact to feeling, from information to affect or passion. It is worth dwelling on the exemplary amplification Priestley offers in this instance, in part because it drives home his affection point, but also because the passage itself is so doggedly material. Here Priestley discusses Addison:

Addison (Spectator, No. 519) Observing how full of life are those parts of nature which are subject to our observations, amplifies it in the following beautiful manner: "Every part of matter is peopled, every green leaf swarms with inhabitants. There is scarce a single humour in the body of a man, or of any other animal, in which our glasses do not discover myriads of living creatures. The surface of animals is also covered with other animals, which are, in the same manner, the basis of other animals, that live upon it. Nay, we find in the most solid bodies, as in marble itself, innumerable cells and cavities, that are clouded with such imperceptible inhabitants, as are too little for the naked eye to discover. On the other hand, if we look into the more bulky parts of nature, we see the seas, lakes, and rivers, teeming with numberless kinds of living creatures. We find every mountain and marsh, wilderness and wood, plentifully stocked with birds and beasts; and every part of matter affording proper necessaries and conveniencies for the livelihood of multitudes which inhabit it."²¹

It certainly does not hurt Priestley's case that the lively Addison passage in question is about life; the passage explores the way a living organism is so often packed with life other than its own. It argues quite plainly in fact for the interpenetrability of matter. The penetrability of matter is a point Priestley draws from David Hartley, the psychologist who held that everything (thoughts, words, ideas, feelings) owes to matter, derives from matter in long associative chains. And given the principle of association, the Addison passage works on both a biological and rhetorical level, arguing about the compoundness of life even as it performs amplification, which is nothing if not the compounding of words.²² Priestley says as much through his various synonyms for what one does when one amplifies—including enlarging and swelling a discourse.

But one cannot enlarge a discourse for the sake of bulk alone, and so Priestley includes a number of cautions such as this: amplifications

²¹Priestley, *A Course of Lectures*, cited in n. 12 above, p. 28.

²²Joseph Priestley, *Hartley's Theory of the Human Mind, on the Principle of the Association of Ideas; with Essays Relating to the Subject of It* (London: J. Johnson, 1775), xlii and 11.

should not string together associations only loosely related. Even so, there is something to the way the chains of association initially form, and so Priestley hastily qualifies that when one is in the initial stages of invention (or as Priestley likes to call it, "recollection"), "it is very possible a writer may cramp his faculties, and inure his productions, by too great a *scrupulosity* in the first composition." He continues:

That close attention to a subject which composition requires, unavoidably warms the imagination: then ideas crowd upon us, the mind hastens, as it were, into the midst of things, and is impatient til those strong conceptions be expressed. In such a situation, to reject the first, perhaps loose and incorrect thoughts, is to reject a train of just and valuable thoughts, that would follow by their connexion with them, and to embarrass and impoverish the whole work. Whenever, therefore, we begin to feel the ardour of composition, it is most adviseable to indulge it freely, and leave little proprieties to be adjusted at our leisure.²³

In his discussion of the importance of giving one's self over to the throng of ideas, Priestley uses the language of speed and warmth. The mind "hastens . . . into the midst of things," hurrying along the "train" of thoughts. The careful attention required by writing itself heats things up, warming the imagination. Attention to fine details during this intense period would cool the flames—"the ardour"—of invention, when the thing to do would be to fan those flames. "Besides," he continues:

If we would wish to communicate to our readers those strong sensations that we feel in the ardour of composition, we must endeavour to express the whole of our sentiments and sensations, in the very *order* and *connexion* in which they actually presented themselves at that time. For, such is the similarity of human minds, that when the same appearances are presented to another person, his mind will, in general, be equally struck and affected with them, and the composition will appear to him to be natural and animated. Whereas, if, in consequence of an ill-judged scrupulosity and delay, we once lose sight of any part of that train of ideas with which our own minds were so warmed and interested, it may be impossible to recover it: and perhaps no other train of ideas, though, separately taken, they may appear to be better adapted to the subject, may have the same power to excite those sensations with which we would wish the composition might be read.²⁴

²³Priestley, *A Course of Lectures*, cited in n. 12 above, p. 31.

²⁴Priestley, *A Course of Lectures*, cited in n. 12 above, p. 32.

This passage, dense with words of motion and heat, also explicitly mentions the “train of ideas”—a Hartleian notion that ideas string together associatively, forming trains. These trains in turn “strike” the mind, creating an impression, a central materialist notion we will consider in some depth later. The passage also posits a directionality of affect by which linked ideas first strike and heat the mind of the composer, are captured in the act of composition, then “reheated” when the composition is read, which in turn strikes and affects the same sensations (presumably warmth and excitement) in the reader.

Heat, Priestley says in *Lectures on a Course of Experimental Philosophy*, is

an affection of bodies well known by the sensation that it excites. It is produced by friction or compression, as by the striking of flint against steel, and the hammering of iron, by the reflection or refraction of light, and by the combustion of inflammable substances.²⁵

Priestley speaks here to the flame-inspired heat that boils his water, and he also knows a fair bit about combustion, since most of Priestley’s experiments in pneumatic chemistry involved explosions. One report of such experiments, from 1769, begins with a veritable laundry list of substances he exploded (or shattered, or deeply charred) with an electrical battery. He begins with a leaf of cabbage:

Making the explosion of a battery pass over the surface of a green cabbage-leaf, I observed that it left a track near 1/4th of an inch in breadth, exceedingly well defined, and distinguishable by a difference of colour from the rest of the leaf. Along this path, also, the firmness of texture in the leaf was entirely destroyed, that part becoming quite flexible, like a piece of cloth. Presently after, it turned yellow, grew withered, and became perfectly brittle.²⁶

He goes on, using the same size battery to shatter window glass, a half-pound piece of corkwood, and a dish of red wine, and later he melts a small piece of iron wire, to develop a theory of electrical circuits. His purpose is to determine why the explosion left such a discernible track on the cabbage-leaf, and upon further experimentation, he finds that the path follows the veins of the cabbage.²⁷ Another

²⁵Joseph Priestley, *Heads of Lectures on a Course of Experimental Philosophy, Particularly Including Chemistry, Delivered at the New College in Hackney* (London: J. Johnson, 1794), 135.

²⁶Joseph Priestley, “Various Experiments on the Force of Electrical Explosions,” *Philosophical Transactions* 59 (1769): 63–70 (p. 63).

²⁷Priestley, “Various Experiments on the Force of Electrical Explosions,” p. 64.

study investigates the communication of electricity within an electrical circuit, which is to say, determines what makes good and bad conductors.²⁸ Priestley lost a few arm hairs in that one.²⁹

Read alongside these explosive experiments, the passages about the roles of warmth and heat in composing arguments appear to follow similar principles; the warmth and speed of idea-trains burn discernible paths through the rhetor's mind, and then the rhetor must carefully replicate those in writing, so that the same effect transmits by the writing that results. In this scheme, much as with the leaf of cabbage with a battery explosion, veiny flesh operates as an excellent rhetorical conductor—and, when attention is paid to order, sparks, and swells, words themselves conduct as well. Passion, fast and hot, is an excellent conductor, whereas reason, slow, plodding, and famously cold, hangs back in the realm of informing.³⁰ This warmth and speed that contributes to the “swell” of discourse we believe operates as rhetorical energy. While it is tempting to read this language of passion-as-heat as strictly metaphorical, Priestley's grounding in Hartley's doctrine—in which thought itself is strictly material—suggests otherwise.

Words, too, act as conductors for Priestley, as evidenced in his description of the visceral effect he feels on hearing a profane word:

I was myself educated so strictly and properly . . . that the hearing of the slightest oath, or irreverent use of the name of God gave me a sensation that is more than mental . . . next to shuddering.³¹

Priestley names his education as the source of the particular associations or “traces of the sensible pleasures and pains,” and the name of God as the source of heat, making his phrase “more than mental” stand out in this passage. The elements which cannot be contained by the category “mental” or “mind” include warmth and sharp sensation. A word conducts warmth, “a sensation increasing in pleasure in all its gradations, from the torpid and benumbed state of the body,

²⁸Joseph Priestley, “An Investigation of the Lateral Explosion, and of the Electricity Communicated to the Electrical Circuit in a Discharge,” *Philosophical Transactions* 60 (1770): 192–210.

²⁹Priestley, “An Investigation of the Lateral Explosion,” p. 193.

³⁰We are here referring to the above discussion of passages in *A Course of Lectures*, cited in n. 12 above, pp. 28–32, but the work of passion is also raised in Lecture XII, pp. 79–88.

³¹Priestley, *Hartley's Theory of the Human Mind*, cited in n. 22 above, p. 202.

till it become actually hot and painful."³² Such lines call to mind the searing, yet navigable veins of Priestley's cabbage.

While no expert in combustion, Gilbert Austin has much to say about heat in the context of rhetoric as well. Concentrating more on the vocal and bodily aspects of rhetorical delivery, Austin worked to move something arguably as elusive as an electrical current: what he terms passion, but might also be called rhetorical energy. Passion, for Austin, bubbles from the mind and emanates from the body, as he writes in *Chironomia*, "All the strong passions of the mind do indeed communicate themselves so suddenly and irresistibly to the body, that vehement gesticulations can hardly be avoided."³³ Note the rapid rush of passion to the edges of the body—the eyes that blaze, the limbs that gesticulate. Austin believes the inattention paid to delivery by British orators manifests in compositions that are dry, cold, and boring: "The want of this attention chills the ardour, and weakens the splendour of their compositions; whereas, the very purpose of animated delivery would warm and excite them."³⁴ Habitual attention renders delivery more than subsidiary to aspiring orators and their teachers—rather it becomes font of invention. Delivery alters composition itself: "The delivery and composition," writes Austin, "mutually act upon and affect each other; where the delivery is to be cold, the composition must be dry and formal. Where it is to be animated and suited to the graces of eloquent delivery, the very language glows and burns as it is formed under the pen."³⁵

For Austin, energy and warmth move from mind to body of the orator to body and then mind of the audience, in a manner not unlike that suggested by Priestley, and that movement is hypothesized to quite literally change the receiving body's constitution:

But above all, the feelings of lively intelligence and sensibility to every changing sentiment, and such expression of the eye and countenance as shall convey them warm from the reader's understanding and heart, to the hearts and the understandings of the hearers, are gifts bestowed only on a few.³⁶

Note that sentiments are conveyed "warm," from the performer's "understanding and heart," respectively the mind and body, to the "hearts and understandings" of the hearer. We argue the chias-

³²Priestley, *A Course of Lectures*, cited in n. 12 above, p. 163.

³³Austin, *Chironomia*, cited in n. 3 above, pp. 137–38.

³⁴Austin, *Chironomia*, cited in n. 3 above, p. 18.

³⁵Austin, *Chironomia*, cited in n. 3 above, pp. 18–19.

³⁶Austin, *Chironomia*, cited in n. 3 above, p. 199.

matic movement—understanding to heart, heart to understanding—is quite deliberate; the movement must happen quickly and in this order so that warmth of sentiment is preserved and not lost.³⁷ The heat from the blazing pen must transmit efficiently, and the way to do that, for Austin, is to refine and perfect the orator's parts and movements—the limbs, the hands, and notably, the eyes.³⁸ The kind of efficient transmission Austin attempts to achieve with scrupulous, even incessant attention to the movement of bodily parts for delivery mimics the aim, if not the spirit, of his experiments in material science.

The challenge of preserving and then transmitting the warmth and excitement of discourse in Austin's rhetorical treatise is paralleled by the main problem three of his four scientific publications attempt to resolve: the infusion of water with lively gas. The problem is one of transference. As Austin puts it in the opening lines of his 1803 publication in *Transactions of the Royal Irish Academy*:

The difficulty of transferring gasses from one jar or receiver to another, without loss, or mixture of atmospheric air, by the common mode in the pneumatic apparatus, must have been experienced often by philosophical chemists. And this difficulty is increased when very large jars are used, and when the production of gas in them is inconsiderable; as when oxygen gas is obtained from vegetables exposed to light, or from decomposition of water.³⁹

Gases are, of course, fleeting substances. By nature they are prone to scatter and mingle. In the context of "impregnating water with fixed air," or carbonation, the keys are purity, contact, and agitation. As Priestley puts it in his first—the first—pamphlet on the topic:

³⁷For an account of the emergence of thermodynamic law from a science studies perspective, please see Bruce Clarke, *Energy Forms: Allegory and Science in the Era of Classical Thermodynamics* (Ann Arbor: University of Michigan Press, 2001).

³⁸The faculty of the eyes, and the place where gazes meet, are also crucial in Austin's theory of energy transmission. He writes "We seem to have the power, as it were, of touching each other by the sense of sight," in *Chironomia*, cited in n. 3 above, p. 102. Rhetorical energy transmits by way of the juncture at speaker and seer's lines of sight. Eye works and supportive countenance are also the essence of amplification, as "The line of the direction of the axis of the eye, however invisible and imaginary, seems as if in effect it could be seen, and that in every instance throughout a great assembly, crossing and radiating in a thousand directions from the centre of every orb of sight" (*Chironomia*, p. 102).

³⁹Gilbert Austin, "Description of an Apparatus for Impregnating Water and Other Substances Strongly with Carbonic Acid Gas," *Transactions of the Royal Irish Academy* (1799), 131–34 (p. 133).

If water be only in contact with fixed air, it will begin to imbibe it, but the mixture is greatly accelerated by agitation which is continually bringing fresh particles of air and water into contact. All that is necessary, therefore, to make this process expeditious and effectual, is first to procure a sufficient quantity of this fixed air, and then to contrive a method by which the air and water may be strongly agitated in the same vessel, without any danger of admitting the common air to them. . . .⁴⁰

Like so many other scientific breakthroughs, the process and apparatuses Priestley devised for carbonation were left for others to improve upon. As John Mervin Nooth, a physician investigating the medical uses of carbonated water, observed, Priestley's design was rather cumbersome. It included a narrow-necked glass vessel, a large basin, flexible piping sewn from leather, and a bladder. What's more, the bladder, most likely a sheep's or goat's bladder, which Priestley insisted was patently "inoffensive,"⁴¹ was thought by some to introduce offensive tastes into the water: "In some trials which I made with Dr. Priestley's apparatus," writes Nooth, "it always happened, that the water acquired an urinous flavor; and this taste in the water was, in general, so predominant that it could not be swallowed, without some degree of reluctance."⁴² Apart from imparting a repulsive taste, Priestley's apparatus was difficult to operate, and Nooth speculates that "the difficulty in conducting the process, in the manner proposed [by Priestley], has been, in some measure, the reason why so few experiments, on this subject, have been made public."⁴³ But after 1775 when Nooth introduced his refined apparatus, which he sold to pharmacies, *Philosophical Transactions* did not publish any innovations on the apparatus or process for carbonation until 1813, when it published Gilbert Austin's description of a condenser and air-pump, used to prepare artificial mineral waters. The 1813 piece described further improvements to apparatuses Austin presented to the Royal Irish Academy, and that were published in its *Transactions* in 1799 and 1803.

⁴⁰Joseph Priestley, "Impregnating Water with Fixed Air; In Order to Communicate to it the Peculiar Spirit and Virtues of Pyrmont Water, and Other Mineral Waters of a Similar Nature" (London: J. Johnson, 1772), 5.

⁴¹Priestley, "Impregnating Water with Fixed Air," p. 10.

⁴²John Mervin Nooth, "The Description of an Apparatus for Impregnating Water with Fixed Air; and of the Manner of Conducting that Process," *Philosophical Transactions* 65 (1775): 59–66 (p. 60).

⁴³Nooth, "The Description of an Apparatus for Impregnating Water with Fixed Air," p. 59.

Austin fashioned his first apparatus out of brass, and while the water may not have tasted like urine, it was still metallic. “[H]owever carefully cleaned,” he wrote, brass “perceivably imparts a taste of the metal to the water.”⁴⁴ At the outset, then, Austin was not entirely satisfied. As he put it, “It is adviseable therefore to make it of some metal which either may not possibly impart any sensible taste to the water, or which may not be considered injurious even if dissolved.”⁴⁵ His strongest wish at that point was to fashion the apparatus of glass, which he ultimately did, but not for another decade or so, for the project, in Austin’s words, had to be set aside “on account of my other avocations.”⁴⁶ But it would be difficult for glass to withstand the pressure created through the process’s necessary agitation, as Austin worried:

The great impediment to the forming of pneumatic instruments of glass, appears to me to have arisen from the difficulty of making the necessary joining, in such a manner as to be capable of sustaining very considerable pressure, to be easily disunited or connected, as occasion might require, and to be perfectly air tight.⁴⁷

In order to maximize efficiency of transmission, Austin’s 1813 revision attends in highly specific terms to airtight junctures and valves between segments, the capacity and efficiency of containers used, and adequate support for the apparatus (he suggests planks of mahogany wood). For example, he explains regarding the junctures:

The conical junctures hitherto used, do not bear much pressure, and are objectionable in other respects: I have therefore formed my joints of plane surfaces, and find them as perfect, as permanent, and as easy in application as I can desire.⁴⁸

The innovation mainly identifies and troubleshoots like inefficiencies, with an eye toward controlled communication—the strategic use of pressure by way of the apparatus’ alignment—in order to combat what Austin calls the “danger of loss.”⁴⁹ The goal for the transmission of both gas *and* passion is to control the container—or better, the air

⁴⁴ Austin, “Description of an Apparatus,” p. 133.

⁴⁵ Austin, “Description of an Apparatus,” p. 133.

⁴⁶ Gilbert Austin, “On a New Construction of a Condenser and Air-Pump,” *Philosophical Transactions of the Royal Society of London* (1813): 138–45 (p. 138).

⁴⁷ Austin, “On a New Construction,” p. 140.

⁴⁸ Austin, “On a New Construction,” p. 140.

⁴⁹ Gilbert Austin, “Description of an Apparatus for Transferring Gasses Over Water or Mercury,” *Transactions of the Royal Irish Academy* (1803): 3–9 (p. 6).

between the containers. They must be “perfectly air tight.”⁵⁰ In carbon transmission, pressure and speed are controlled and maintained by the use of valves and stopcocks; in rhetorical transmission, the pressure of passion is controlled by rigorous training of the attention and of the body.

If, in Austin’s scheme for delivery as discussed above, the passions move from mind to body of the performer and then to the body and mind of the audience, and if “expression of the eye and countenance”⁵¹ (generally the comportment and movement) function to convey the energy, then the potential problems in rhetorical delivery are philosophically—and materially—very similar to the problems in transferring gasses into water. There are several potential leaky valves, several possible steps in which energy can dissolve into nothing. Thus like the elocutionists before him, Austin believes that gesticulations must be sharply controlled.⁵² He warns against becoming one of those speakers who “falls into undignified gesticulations, and into absurd distortions,”⁵³ which obstruct transmission in that they “are more likely to excite in the cultivated spectator, laughter or disgust, than the kindred passion of the gesticulator.”⁵⁴ At first alarming, frenetic gestures eventually dissipate into the air as unharnessed rhetorical energy: “These iterations of awkward gesture,” writes Austin, “are disgusting at first, but at last are entirely overlooked, and stand for nothing.”⁵⁵ Yet because speakers are aware of this “danger,” he observes, they “are often found carefully to restrain themselves, and to stand unmoved; using no gesture at all.”⁵⁶ Passionate, gestural energy must therefore be controlled in order to be conveyed, but not to the point of being shut off, which—if we could hark to the pump model as an indication—could quell the current full stop.⁵⁷

⁵⁰ Austin, “On a New Construction,” cited in n. 46 above, p. 140.

⁵¹ Austin, *Chironomia*, cited in n. 3 above, p. 199, cf. n. 38.

⁵² See Thomas Sheridan, *A Course of Lectures on Elocution* (London: W. Strahan, 1762) and John Walker, *Elements of Elocution: In Which the Principles of Reading and Speaking are Investigated* (1781) (Bristol: Thoemmes Press, 2003).

⁵³ Austin, *Chironomia*, cited in n. 3 above, p. 138.

⁵⁴ Austin, *Chironomia*, cited in n. 3 above, p. 138.

⁵⁵ Austin, *Chironomia*, cited in n. 3 above, p. 139.

⁵⁶ Austin, *Chironomia*, cited in n. 3 above, pp. 138–39.

⁵⁷ The key, then, for Austin is control, as Phillipa Spoel has noticed. While Spoel lingers on this observation in order to call attention to Austin’s Foucauldian mechanisms of control and order, we are investigating more carefully the contours of that control and what they might reveal about Austin’s theory of rhetorical energy—how it moves between bodies.

IMPRESSION: LIGHT AND STEEL

"Impression" names a discernible, effective action that appears with some frequency in the rhetorical and scientific writings of Priestley and Austin. In both rhetorical and scientific writings, the word seems to tilt more toward the concrete imprint sense than its less substantial, strictly cognitive sense (as in "first impression"). Or better put, usages of the word in Priestley and Austin overlap to align with David Hume's use of "impression" to designate the liveliest perceptions. Hume distinguishes impressions from ideas, suggesting the former are momentary products of direct sense experience, and the latter, fainter copies of the former (such that belief can be tracked to distinct impressions). For Priestley and Austin too, impressions mark. For Priestley, the imprint is left on the mind in such a way as to alter its operation—effecting the constitution of subsequent associations, formatting belief. For Austin, whose scientific work, as we will show, examined grooves cut by impression on metal, "depth" of impression likewise effects belief, both in terms of magnitude and duration. Rhetorical impressions for both so significantly root in bodies as to effect even the hearers' movements, both immediately and more distantly, suggesting again the word's ability to conduct, to suffuse, and to move. Here is Priestley: "for as words pronounced call up visible ideas, so visible ideas and objects call up the ideas of words, and the actions by which they are all pronounced."⁵⁸ The impression-making trains, then, move in both directions.

To illustrate impression Priestley uses the example of light:

Thus also, when a person has had a candle, a window, or any other lucid and well-defined object before his eyes, for a considerable time, he may perceive a very clear and precise image thereof to be left in the *sensorium*, fancy, or mind for some time after he has closed his eyes.⁵⁹

The example as well as the concept here are drawn almost entirely from Newton, who uses light from a burning coal to illustrate the phenomenon, and the extent to which impressions endure after exposure ends:

If a burning coal be nimbly moved round in a circle, with gyrations continually repeated, the whole circle will appear like fire; the reason

⁵⁸Priestley, *Hartley's Theory of the Human Mind*, cited in n. 22 above, p. 74.

⁵⁹Priestley, *Hartley's Theory of the Human Mind*, cited in n. 22 above, p. 10.

of which is, that the sensation of the coal, in the several places in that circle, *remains impressed on the sensorium*, until the coal returns to the same place.⁶⁰

For Newton (as well as Priestley), external objects are impressed on the body by way of the senses, and the mind, if even for a short time, holds onto them. Matter is incorporated by sense—the seer's constitution changes with the coal light.

Ideas, as well as sensations, communicate to and from the brain by way of vibrations, Dr. Hartley suggests. Each comprises matter and motion (substance and movement), such that nerves have only to be of such texture that "if their extreme parts be put into a vibratory motion, that motion may be freely propagated to the brain, and be continued there."⁶¹ By this theory, the brain, because it is a continuation of the nerve substance, according to Hartley, manifests an idea or sensation likewise through vibration. As with sounds of individual instruments in a symphony, or "the vibration of the air a little above the streets of such a city as London," vibrations in the body will concur, forming the associations that comprise sensation as well as what is here called "thinking."⁶² A second example using light relates impression to feeling, or the striking of associations by way of nerves:

Every person, I believe, feels a gleam of pleasure the moment that light is introduced into a dark room, and disagreeable sensations tending toward melancholy, and sometimes verging towards the borders of terror, upon passing suddenly from a light into a perfectly dark place.⁶³

So enmattered is thought according to Dr. Hartley's theory, Priestley concludes, as to leave in bodies

nothing to the province of any other principle, except the simple power of perception; so that if it were possible that matter could be endued with this property, *immateriality*, as far as it has been supposed to belong to man, would be excluded altogether.⁶⁴

Hartley's doctrine of vibrations is the materialist base for Priestley's theory of rhetoric. While any sense stimulus may cause impression—Priestley stipulates even food makes an impression on the tongue

⁶⁰Priestley, *Hartley's Theory of the Human Mind*, cited in n. 22 above, p. 9.

⁶¹Priestley, *Hartley's Theory of the Human Mind*, cited in n. 22 above, p. 9.

⁶²Priestley, *Hartley's Theory of the Human Mind*, cited in n. 22 above, p. xvi.

⁶³Priestley, *Hartley's Theory of the Human Mind*, cited in n. 22 above, pp. xlvi-xlvii.

⁶⁴Priestley, *Hartley's Theory of the Human Mind*, cited in n. 22 above, pp. xlvi-xlvii.

and stomach—images carve especially deep ruts. Priestley's rhetoric thus emphasizes use of sensory images in inventing artistic appeals because he claims the audience moves in direct proportion to "the vividness of our ideas of those objects and circumstances which contribute to or excite them."⁶⁵ Specifically, the rhetor should "think more intensely" and "make ideas more vivid, and the scene more interesting"⁶⁶ because sensible images become triggers for particular associative paths. "When a variety of ideas are associated together," Priestley writes, "the visible idea, being more glaring and distinct than the rest, performs the office of a symbol to all the rest, suggests them, and connects them together."⁶⁷ In generating artistic appeals, this means introducing as many sensible images as possible, while avoiding abstractions and generalizations, because "these ideas alone are the strongest sensations and emotions annexed."⁶⁸ It is rhetorically strategic to amplify by way of—or to tap—existent associative pathways. This "tapping" charges the hearer with sensation relevant to the claim at hand. Images produced in discourse thus more than signify. For Priestley, they invoke (and evoke) experience, and in so doing form new synaptic chains:

the more precise and vivid are our ideas, with the greater strength do they excite all the emotions and passions that depend upon them. The mention of these particulars makes a relation to resemble real and active life.⁶⁹

Repeated sensations leave traces that amass to form the simple ideas of sensation, which by association form more complex concepts. Annexations produce the abstractions that circulate at the level of public discourse (or which Priestley suggests orators address), and form the basis for rational assessment (judgment). One example he uses to illustrate the move from the particular to abstract in concept untangles the idea of white:

If we only consider that short and simple process by which we get the idea of *white* or *whiteness*, namely, by leaving out what is particular in all the objects which we have seen of that colour, and restricting the meaning of the term to what is common to them all, we shall not be at a loss for the manner in which we come by such ideas as are denoted by

⁶⁵Priestley, *A Course of Lectures*, cited in n. 12 above, p. 79.

⁶⁶Priestley, *A Course of Lectures*, cited in n. 12 above, p. 80.

⁶⁷Priestley, *Hartley's Theory of the Human Mind*, cited in n. 22 above, p. 22.

⁶⁸Priestley, *A Course of Lectures*, cited in n. 12 above, p. 84.

⁶⁹Priestley, *A Course of Lectures*, cited in n. 12 above, p. 85.

the words *substance, space, duration, identity, reality, possibility, necessity, contingency, &c.* for these only express those circumstances, in which a great variety of particular things, all originally the objects of our senses, agree; the peculiarities in each being overlooked.⁷⁰

For an orator, of course, this means building a case of particulars, and binding those particulars with existent associative pathways in order to garner force for (and underscore) generalization. Judgment happens by a similar premise, and, Priestley suggests, is no less rooted in the physiology of association. He explains,

the moment we perceive that the parts of any object are analogous to one another, and find, or are informed, what that analogy is, the sight of a part, without any farther investigation, suggests the idea of the whole; and the *judgment* is most agreeably and successfully employed in completing the image.⁷¹

This applies to rhetorical outcomes, of course, as Priestley emphasizes the proper end of rhetoric is to inform the judgment and influence practice.⁷² The premise also holds for “the view of a part of any thing the proportions of which are known, as of an animal body, of a regular curve, or polygon, a regular building, a regular garden, or of a consistent set of political, philosophical, or theological principles.”⁷³ Thus, Priestley suggests, sensation precedes and facilitates even chilly rational assent—even what we think of as highest order abstractions.

Impressions register both in and on the body. To illustrate this, Priestley uses the example of flinching. The flinch is pre- (or extra-) rational:

the appearance of the fire, or of a knife, especially in circumstances like to those in which the child was burnt or cut, will raise up in the child’s nervous system painful vibrations of the same kind with, but less degree than, those which the actual wound or burn occasioned.⁷⁴

These “miniature vibrations” are contained to the common sensory. The flesh in the affected areas—for carrying the disposition to flinch—

⁷⁰Priestley, *Hartley’s Theory of the Human Mind*, cited in n. 22 above, p. xli.

⁷¹Priestley, *A Course of Lectures*, cited in n. 12 above, p. 164.

⁷²Priestley, *A Course of Lectures*, cited in n. 12 above, p. 68.

⁷³Priestley, *A Course of Lectures*, cited in n. 12 above, pp. 164–65.

⁷⁴Priestley, *Hartley’s Theory of the Human Mind*, cited in n. 22 above, p. 48.

is essentially changed by the temporary experience of pain. But sensation need not be so dire as burns or cuts to leave a fleshy imprint. Priestley considers the touch of one's hand to another's body:

When we apply the parts of our bodies to each other, particularly our hands to the several parts of the surface of our bodies, we excite vibrations in both parts, viz. both in the hands, and in the part of the surface which we touch.⁷⁵

It is not merely then that in perceiving, the body serves as conduit to mind. The hand infolds and is changed by the surface. The body (fingers, or hand) mediates the vibrations that move to mind. And important to Priestley's rhetoric (especially his segments on delivery), touch is a two way street:

we impress a great variety of sensations ourselves by our hands, accordingly as they are hot or cold, by friction, scratching, &c. and most impressions from foreign bodies will bear some resemblance to these.⁷⁶

Thus rhetoric, like ideas or concepts here, is pulled down from its metaphysical loft and made to incorporate alongside burns and cuts. The rhetor becomes a manager of imprints—and rhetoric, the strategic extension of hands toward the surface of another.

Like the touching hand, words impress. Even the way Priestley introduces the transition in his rhetoric from issues of content to issues of style underscores the word's capacity to mark the hearer. Speaking to the "body of a discourse," Priestley describes invention and arrangement as "the nerves and sinews of a composition."⁷⁷ Style he calls "the covering of this body . . . the external lineaments, the colour, the complexion, and the gracefull attitude of it."⁷⁸ But words for Priestley are more skin than figure. They root in impression and so can bear vestige of flesh (this is not the same as saying words are "natural," or born of common sense). Harking to the example of the burnt or cut child, for example, Priestley explains how "By degrees these miniature pains will be transferred upon the words, and other symbols, which denote these and such-like objects and circumstances."⁷⁹ Words also change with the nature and depth of impression. Consider the case of a person in pain who cries out to

⁷⁵Priestley, *Hartley's Theory of the Human Mind*, cited in n. 22 above, p. 43.

⁷⁶Priestley, *Hartley's Theory of the Human Mind*, cited in n. 22 above, p. 44.

⁷⁷Priestley, *Hartley's Theory of the Human Mind*, cited in n. 22 above, p. 7.

⁷⁸Priestley, *Hartley's Theory of the Human Mind*, cited in n. 22 above, pp. 71–72.

⁷⁹Priestley, *A Course of Lectures*, cited in n. 12 above, pp. 170–71.

his friend, “*Oh, I burn, I am torn to pieces, I am upon the rack, &c.*” Although burning, tearing, and certainly the rack are not present to this situation (we can imagine, for the sake of exercise, the speaker has incurred a mild cut), Priestley explains the words not only extend the speaker’s own experience of the sensation—a principle useful for the rhetor who means to continue to embody conviction throughout a speech, certainly—but by association they extend something of it to the friend. Later, Priestley says, when the person who received the wound is better “at leisure to contemplate his calamitous situation,” his words, and with them the impression he leaves, will change.

But the body can affect sentiment without the mediation of text, as well:

What person if he saw another upon a precipice and in danger of falling, could help starting back, and throwing himself into the same posture as he would do if he himself were going to fall?⁸⁰

This happens not because the onlooker has reasoned the startle would help things, of course. Rather this manifests the common sensory so impressed as to adopt and actuate the image presented it—that is, Priestley explains, the onlooker’s limbs respond instantly, mechanically. The more vivid the image, the more entirely, and with greater facility he adopts himself to the situation he views.⁸¹ This associational phenomenon—bound up as it is with the hand on the body surface in the above example—can have distinctly rhetorical effects, and should affect rhetorical strategy. Like the vividmost images depicted in words, precise movements will exact great physical sympathy. Gesture, for example, by Hartleian doctrine, conveys meaning: “As we express our inward sentiments by words, so we also do by gestures, and particularly muscles of the face. Here again, association and imitation display themselves.”⁸² For the rhetor, this means minding your body, in view of the possibility for imitation—the affective transfer described above (the sort of “falling” effect, which could be good for one’s cause if one presents heartfully). But Priestley recommends minding the *audience’s* bodies, as well—in particular, the gut intuition that will uncover faked positions or claims. He warns,

All motions that are automatic have a quickness and vigour which are lost when they become voluntary; witness sighing, laughing, the

⁸⁰Priestley, *A Course of Lectures*, cited in n. 12 above, p. 127.

⁸¹Priestley, *Hartley’s Theory of the Human Mind*, cited in n. 22 above, pp. 71–72.

⁸²Priestley, *Hartley’s Theory of the Human Mind*, cited in n. 22 above, p. 97.

gestures particular to anger, &c. and the same when imitated. The difference is too apparent to escape any person's attention.⁸³

It is the hearer's common sensory, by way of impression, he says, that knows the difference.

The hearer may (again, pre-rationally) associate confident gesture, for example, with the truth of things—an open, extended hand perhaps annexes to trustworthy ideas from the past. By virtue of this rather common ground, the hearer may move to agree. And “move” is important here, given Priestley takes the only two proper ends of rhetoric to be informing the judgment and influencing the *practice*. He admits that as inartistic appeals do plod, and reason can be slow to judge—appeals to the passion (or the body) finally, are required to *move*.⁸⁴ Specifically, he says,

The orator may, indeed, intend to please or affect his hearers; but, if he understands himself, he only means to influence their *judgments*, or *resolutions*, by the medium of the imagination or the passions.⁸⁵

Later that same treatise, he writes of the moment when the passions are engaged:

We feel ourselves interested, in proportion to the *vividness of our ideas* of those objects and circumstances which contribute to excite them. The genuine and the proper use of the passions undoubtedly is to rouse men to just and vigorous action upon every emergency, without the slow intervention of reason.⁸⁶

Impression—for this ability to move, and to move *quickly*—thus should be central to the construction of appeals—or at least, factored into the rhetor's delivery.

⁸³Priestley, *Hartley's Theory of the Human Mind*, cited in n. 22 above, pp. 114–15.

⁸⁴This also aligns with Hume's conception beliefs as lively ideas. For Hume, as with Priestley, beliefs are extra-rational direct results of particularly residual sense impressions. Thus as one does not separate the idea of light of flame from heat, and so believes that the flame is hot is based on the accumulation and concatenation of those particular impressions, Priestley says the rhetor can use gesture to evoke associations of trust. Likewise, as for Hume “The most lively thought is still inferior to the duller sensation,” Priestley emphasizes the surest, fastest route to tapping audience belief is through the body. See David Hume, *An Enquiry Concerning Human Understanding* (Mineola, NY: Dover Publications, 2004), 9.

⁸⁵Priestley, *Hartley's Theory of the Human Mind*, cited in n. 22 above, p. 68.

⁸⁶Priestley, *Hartley's Theory of the Human Mind*, cited in n. 22 above, p. 80.

AUSTIN'S SCREWS

Austin, too, carries impression through his scientific and rhetorical writings. In "A Method of Cutting Very Fine Screws," he describes the process by which he fashioned screws for use with a micrometer that is part of an equatorial instrument. His basic method is quite intricate. He first fashioned a steel cylinder out of "a piece of the best steel wire," and then wound a piece of very fine steel wire around it, leaving room "for the edge of a very fine knife."⁸⁷ His description continues:

I turned the cylinder about with my hand, and guiding the knife by the threads of the wire, by a few turns I made an impression on the steel, sufficient, when I stripped off the wire, to serve as a guide for the knife to run in and cut the thread to a sufficient depth.⁸⁸

And yet this method of impression does not give Austin the consistent precision he wants, "on account of the difficulty of guiding the hand, and determining the proper degree of tension to be given to the wire on the cylinder."⁸⁹ Indeed, he confesses that his article "should not have mentioned this method" since he has since "very much improved upon it."⁹⁰ Austin's piece goes on to refine this method, incorporating a notched bar which "communicates" with the knife. The weight of the knife is modulated by a hooked weight. The entire apparatus is designed for impressing the steel of the screw just so.

The discussion of impression in *Chironomia* resides in the realm between the first and second apparatus; between, that is, the screw fashioned by the shaky, inconsistent hands—the method that Austin "found subject to a considerable variation with respect to the fineness of the screw produced"—⁹¹ and the apparatus in which the revolutions of the screw-to-be and the pressure of the knife are more closely regulated by the addition of the bar and the weight. Impression, as seen in the method of creating screws, calls out for precision and modulation achieved by regulating materials—a bar, a weight, a wire.

Rhetorical impression goes in one direction—from orator through audience—as evidenced by the long meditation on "impressive reading," which depends on "the reader's exertions to keep his congre-

⁸⁷Gilbert Austin, "A Method of Cutting Very Fine Screws, and Screws of Two or More Threads & C.," *The Transactions of the Royal Irish Academy* (1803): 145–49 (p. 146).

⁸⁸Austin, "A Method of Cutting Very Fine Screws," p. 146.

⁸⁹Austin, "A Method of Cutting Very Fine Screws," p. 146.

⁹⁰Austin, "A Method of Cutting Very Fine Screws," p. 147.

⁹¹Austin, "A Method of Cutting Very Fine Screws," p. 146.

gation alive to the many excellencies" of the liturgical composition, "and what is more important," he writes, "to engage them at the same time to a due communication in its sentiments."⁹² The word "due" here assumes the same role as the hooked weight in screw-fashioning in that it regulates pressure: not too much, not too little. Austin's advice for improvement on reading includes

the deep study of his own language, and the weighing of every syllable according to the authorities of the most celebrated orthoepists and public speakers. He must examine, and correct where deficient, his own articulation, his accent, his voice and all his powers; he must think no labour too minute, nor to [*sic*] arduous which may tend to his improvement and perfection.⁹³

Such an approach, Austin goes on to say, will "advance" the reader

truly towards perfection; and keep long alive both his own feelings and those of his hearers: and should they even grow dull, by frequent repetition; the good habits he has acquired will, if not renew them, still carry him through in the discharge of his duty so as to benefit his hearers, which is the main object, and impress upon his reading the characters of propriety, of feeling, and of devotion.⁹⁴

What we have here is a model of training that, like the improved method for cutting fine screws, minimizes the variation by providing the "grooves" of good habits and allowing for consistent impression "upon his reading." The reading itself therefore receives and then conveys the impression to the object (the hearers).

This view of performed language as the facilitator of impression appears later in the treatise when Austin returns to the voice, this time in relation to gesture. Here, words themselves receive and convey the impression of the voice: "the stroke of the gesture," he writes, "is analogous to the impression of the voice, made on those words, which it would illustrate or enforce."⁹⁵ Words, then, do the work of the bar that guides the grooves followed by the knife's edge. The grooves, in rhetorical delivery, are regulated by the habits of reading and in the context of oratory by the weight of passion via voice and gesture. Indeed, rhetorical delivery proves just as challenging in creating a perfect impression, because while Austin's screw-cutting method produced too much variation in the grooves owing to the "guiding

⁹²Austin, *Chironomia*, cited in n. 3 above, p. 194.

⁹³Austin, *Chironomia*, cited in n. 3 above, p. 197.

⁹⁴Austin, *Chironomia*, cited in n. 3 above, p. 197.

⁹⁵Austin, *Chironomia*, cited in n. 3 above, p. 377.

hand” and the variable tension, the stroke and voice of delivery are subject to the fluctuating of the passions and must be brought into line with one another. The key difference between impression management in fine screws and impression management in delivery is that the impressions of gesture and voice are being made on eyes and ears respectively. Like the voice, the stroke

should fall precisely on the . . . accented syllable of the emphatical word; so that the emphatical force of the voice and the stroke of the gesture co operate in order to present the idea in the most lively and distinguished manner, as well to the eye as to the ear of the hearer.⁹⁶

Both the stroke and the voice, “capable of equal force and variety,” must be carefully modulated, all in the service of the eye and ear of the hearer. When gesture and voice are not carefully orchestrated as an impression-set, the result is much like the inferior screw-making method—the one that Austin “should not have mentioned”: “the arms seem to wander about in quest of some uncertain object, like a person groping in the dark.”⁹⁷

Careful modulation of gesture therefore necessitates a careful theorization of persuasion and passion. Austin notes for example that orators’ gestures differ markedly from those of soldiers. Whereas soldiers change positions rapidly,

within as narrow a space and in as short a time as possible . . . confined and sudden motions do not suit an orator, except when perhaps the vehemence of passion urges him to the most rapid expression.⁹⁸

At issue are speed and control, and persuasion is not swift. Austin’s explanation gives a uniquely physical and kinetic theory of persuasion that serves to illuminate the second part of the chiasmus we discussed earlier in which the rhetorical energy moves between bodies: “Persuasion,” he writes, “reaches the mind slowly, and is insinuated by circumlocution not of words only, but it may also be said, of gesture also.”⁹⁹ The seeping-in of persuasion, aided by gesture, must be restrained, subtle, and indirect. Austin offers three line-drawings of models to prepare for a gesture’s movement. One of these drawings, incidentally, resembles the blades of a saw. After the third drawing he writes that the line of preparation for a gesture

⁹⁶ Austin, *Chironomia*, cited in n. 3 above, p. 377.

⁹⁷ Austin, *Chironomia*, cited in n. 3 above, pp. 377–78.

⁹⁸ Austin, *Chironomia*, cited in n. 3 above, p. 411.

⁹⁹ Austin, *Chironomia*, cited in n. 3 above, p. 411.

will also occasionally follow other curves. But whatever the form of this indirect line may be, it is used as a preparation for the gesture to which it leads: and the extent of the return or the depth of the sweep or indentation is determined by the character of the sentiments delivered.

The gestures themselves, like the words, receive impressions—here called an “indentation.” Those impressions are formed by the sharpness or dullness of passion, and their depth and frequency must be managed.

For Austin, timing is a crucial component of managing impression, and his chapter “Of the Stroke and Time of Gesture” explains how passion notches the time between words and gestures:

in calm discourse, the words and gestures are nearly contemporaneous: and in high passion the order is. 1. The eyes. 2. The countenance in general. 3. The gestures. 4. Language. But the interval between each is extremely limited.¹⁰⁰

This passage follows from and elaborates on an intriguing passage just preceding:

If his manner of speaking be confined to mere dry dissertation, he will proceed coldly and uniformly throughout; but if his argument be maintained by rhetorical ornament and illustration; and if he appeal to the passions of the audience, he will himself be excited, and the interest he feels, however rapidly he may proceed, will discover itself at each different period in the following order. The thought which arises in his mind will instantly be seen in his countenance, and first in his eyes, which it will brighten or suffuse, then suitable gestures follow, and last the words find utterance.¹⁰¹

With this passage, Austin offers, for the sake of discussion, a super-slow close-up of passion’s path: it moves from mind to body to word. Passion therefore works through warm suffusion, its brightness ideally controlled but not dimmed.

CONCLUSION

So, what does it matter that Austin’s theories of delivery owe as much to his scientific experiments as they do to his readings in (and extensive quotations of) Roman rhetoric? Or that Priestley’s

¹⁰⁰Austin, *Chironomia*, cited in n. 3 above, pp. 381–82.

¹⁰¹*Chironomia*, cited in n. 3 above, p. 381.

theories of composition and style, built as they are on Hartleian associationism, also show remarkable confluence with his scientific experiments? Our aim has been to dwell on two proximate moments in the history of rhetoric when bodies, passions, their materiality and their movement come to matter intensely and were deliberately incorporated into a rhetorical theory. We offer that Priestley and Austin's theories of rhetorical transmission are demonstrably, if subtly, derived from scientific experiments and materialist theories of vibrations. The case studies, we hope, are of both historical and theoretical use. First, our account argues most generally for the place of material rhetoric in rhetorical histories; specifically, for science—that of the eighteenth century in particular—as canonical resource for material rhetoric. The account disrupts the previously established movements within eighteenth-century rhetoric, which slot Priestley and Austin into psychological/epistemological and elocutionary camps respectively (and reductively). We suggest instead considering them proponents of a material rhetoric. Though it is beyond the scope of the current study, perhaps other figures will be found to belong also to this category. Second, our account draws attention to specific—and specifically material—rhetorical principles: heat and impression. Priestley's *Course on Oratory*, that is, folds rhetoric into a view of the material world as vibrational and highly associative, and *Chironomia* attempts to harness and direct the bodily energy of passions. Both approaches offer to rationalize that which is not rational. Both also, and crucially, shove bodies and materiality to the fore, and with them, theories of physical connectivity, of kinetic energy, and theories about how rhetoric can work to change minds materially. The charge of warm bodily passions, and the processes of creating a deliberate rhetorical impression are the enlivening force of both Priestley and Austin's materialist rhetorical theories—the elements that through conduction and impression, through warmth and sharpness, contain the possibility of lively transformation not available to the cold, the lifeless, or the dull.