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ARTICLE

# DEAFNESS, IDEAS AND THE LANGUAGE OF THOUGHT IN THE LATE 1600S

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Psychology describes what was observed.[1]

## INTRODUCTION

This article sets out to be a historical contribution to ongoing debates around the notion of an 'explanatory gap', inherent, as some argue today, in materialist explanations of consciousness – the notion that such explanations do not provide an account of the 'what-it-is-likeness', or 'qualia', of subjective experience. However, rather than address contemporary discussions, what I attempt here is to retrace one possible, specific genealogy of the question about the status of scientific accounts of the human mind, by performing what Jonathan Rée has called 'philosophical history'.[2] I assume from the outset that positive theories of cognition based on neurological or generally materialist accounts cannot do away with a puzzlement with regard to their relevance in answering the question of how it is that we are what we are – that is, individuals endowed with consciousness, or with what in early modernity was referred to as the rational soul. The capacity to posit such a problem of consciousness is specific to humans, and to the human mind. Certainly, as the cognitive sciences today acknowledge and study, we are evolved creatures, on a continuum with the rest of the natural world. Tools such as, say, metarepresentational language – thanks to which we are able to devise questions about our nature and origins – belongs to humans alone. Language too is bound to be an evolved function. But the philosophically and humanistically framed question remains of whether or not a concept of human exceptionality is necessary to the analysis of language. This article analyses a historical configuration of this question.

[1]Ludwig Wittgenstein, *Remarks on Colour* (Berkeley and Los Angeles 1978), p. 13 (I–80): 'Die Psychologie beschreibt, was beobachtet wurde'.
[2]See Jonathan Rée, *I Hear A Voice: Language, Deafness and the Senses: A Philosophical History* (London 1999), Afterword, esp. pp. 379–86. See also Ian Hacking, 'Historical Ontology', in *Historical Ontology* (Cambridge, Mass. and London 2002), pp.1–26, esp. pp. 6–7.

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During the late seventeenth century, a tension between a new naturalism and the continued presence of a theodicy pervaded humanist culture. Central to early modern concerns was the need to preserve, in light of this naturalism, a wedge between the human and the animal realms. Partly for this reason, language, considered specific to humankind, was an intense object of study, as was the nature of ideas and of their relation to language. The thirst for a universal language during the period of the scientific revolution was also an aspect of this set of concerns. These issues have been much studied over the past decades, notably by such scholars as Hans Aarsleef,[3] for example. But their philosophical relevance to debates that were raging between the period's metaphysicians and within the community of natural philosophers has been relatively neglected. This might be because the traditional subject-matter of modern philosophy was formed in the late seventeenth century out of the twin disciplines of metaphysics on the one hand, and of what would eventually be known as epistemology on the other. The first determined to a large extent the realm of physics; the second was initially (arguably until Locke) an aspect of psychology. However, the remit of philosophy today has overcome the foundational separation of metaphysics from natural philosophy, and of epistemology from psychology and the mind sciences. The reconfiguration of the disciplines has, arguably, contributed to shaping the contemporary explanatory gap, but, for reasons internal to this reconfiguration and to the separation of the sciences from the humanities, today's philosophical debates have lost sight of the early modern questions surrounding the nature of human knowledge and human nature, and of the relation between the two. This is why it is time to retrace the processes whereby Cartesian dualism was absorbed into the very core of modern philosophy – supposedly consecrating its birth – in light of the debates that were popular at the time within those very scientific communities that were responsible for the transformations of the relation between ideas and knowledge, and so between experiment and evidence.

This article is therefore conceived as one possible way of retracing the problematization of the status of the scientific analysis of the human mind. It offers an account of the debates that took place, mainly and most centrally in England and France, from the late 1660s until the end of the seventeenth century, about the nature, compass and limitations of language in relation to notions which were emerging at the time about a specifically human rationality. The rational soul posited within the various models of faculty psychology had been displaced by the new science, causing a revolution in its relation to the realms of the material body and to God. It is

[3]See, for example, Hans Aarsleff, *Language, Man and Knowledge in the Sixteenth and Seventeenth Centuries* (Princeton 1964); *From Locke to Saussure. Essays on the Study of Language and Intellectual History* (London and Minneapolis 1982); 'Leibniz and Locke on Language', *Philosophical Quarterly*, 1964, 1:165–88; reprinted in Aarsleff, *From Locke to Saussure*, pp. 42–83; 'An Outline of Language-Origins Theory Since the Renaissance', *Annals of the New York Academy of Science*, 1977, 280: 4–13.

a commonplace of the history of philosophy that, in England, definitions of reason in the post-Scholastic era were a function of the development of new criteria for the delimitation of the realm within which the empirical study of nature conveyed scientific information. Language was considered at once to be the condition for the transmission of empirical knowledge and the outcome of the necessarily limited nature of the human understanding of the God-created world. In this way, considerations about language throw light on the centrality of a specifically humanist scepticism to the establishment of the rules for empirical investigation that would become integrated into the Royal Society's programme. This aspect of the history of speculations about language is largely known to contemporary scholars, in part through the noted analysis of Steven Shapin and Simon Schaffer in *Leviathan and the Air Pump*.[4] Another dimension, however – one which bears direct relevance to the historiography of philosophy – emerges when one analyses it in the context of French early modern thought, and looks at the complexities wrought upon the definition of the immortal rational soul by the advent of Cartesian mind–body dualism. Indeed, while the centrality of language to thought and to the construction of exchangeable information, scientific or otherwise, within a community meant that natural philosophers in the Royal Society were concerned with its transparency with regard to the world they studied, some Cartesian thinkers in France took pains to depict it as a proof of substance dualism, itself centrally posited by Descartes within a system in which God played a central, at least methodological role. These thinkers include figures who are relatively little-known today outside the confines of the history of early modern thought, but who played an important role in configuring the debates that took place at the time.

We begin in England, where we analyse how the metaphysical constraint of demanding that language reflect the Baconian requirement of basing science on observation and induction led a number of members of the Royal Society to reflect on the threefold relationship between language, ideas and knowledge. A case study for this enquiry concerned the ability of the deaf to bear in mind ideas which might, or might not, exist without language – a question through which it was possible to study the constitution of the rational soul. We explore efforts to devise a language for the deaf – within the context of both the quest for a universal language and the philosophical debates on the nature of language and its relation to ideas – by grammarians, linguists and natural philosophers such as George Dalgarno, William Holder, John Wallis and John Wilkins. Crossing the Channel, we take a look mainly at François de Salignac de la Mothe Fénelon's treatise on the education of girls, and at the Cartesian treatise by a lawyer, Gérauld de Cordemoy, for whom the existence of language was a proof of Descartes's version of dualism. It will emerge that, embedded in the progressive

[4]Simon Schaffer and Steven Shapin, *Leviathan and the Air Pump: Hobbes, Boyle, and the Experimental Life* (Princeton 1985).

development of a divergence between English empiricism and French rationalism, there took place a serious debate about the nature of what we call today the 'language of thought' – that is, the notion, broadly, that 'thought and thinking take place in a mental language'.[5] This notion in turn expressed an anxiety about the status of human beings within the divinely created, but scientifically observable, natural realm; and it is in this perspective that I reconstruct the debate here.

## I. EMPIRICAL REASONS

In 1669, the Royal Society published a work by its Fellow, William Holder (1616–1698) – 'English phonetician, music theorist, composer, mathematician, and divine'.[6] Entitled *Elements of Speech: An Essay of Inquiry into The Natural Production of Letters: with An Appendix Concerning Persons Deaf and Dumb*, the book was a practical guide dedicated to instructing the deaf and those who had become dumb 'how to pronounce all Letters, and Syllables, and Words, and in a good measure to discern them by the Eye, when pronounced by another'.[7] Holder had communicated 'an Experiment, concerning *Deafness*'[8] to the Royal Society in 1668, in which he recounted the case of a patient, 'born Deaf, and continued Dumb till his Age of 10. or 11. years'.[9] He studied the young patient's ear, tried to understand the structure and role of the tympanum and noted that the boy could hear when one 'beat a Drum fast and loud by him'.[10] The same interest in the anatomy, physiology and typology of deafness, as well as a concern to mitigate its effects, can be traced in the treatise which Holder published a year later. Here, he took as a given that the precise description of pronunciation and the use of an elaborate phonetic vocabulary could enable those whose access to language was restricted by deafness to acquire a working knowledge of its sounds and to use it along with those who could hear. His treatise was thus not a theoretical disquisition on the nature of language and semantics. The system appears to have worked: the deaf-mute child Alexander Popham is recorded to have learned how to speak for a while. Holder believed that 'the

[5]See the excellent entry on 'The Language of Thought Hypothesis' in the *Stanford Encyclopedia of Philosophy*, at http://plato.stanford.edu/entries/language-thought/.

[6]See R. W. Rieber and J. L. Wollock, *William Holder on Phonetics and Deafness: An Introduction to the New Edition of* Elements of Speech (New York 1975), p. i.

[7]William Holder, *Elements of Speech: An Essay of Inquiry into the Natural Production of Letters* (London 1669; New York 1975), p. 15.

[8]See 'Of an Experiment, concerning *Deafness*, communicated to the R. Society, by that Worthy and learned Divine Dr. *William Holder*, as followeth', *Philosophical Transactions of the Royal Society*, 1668 (May 18), 35: 665–8. See also Roy Porter, 'The Early Royal Society and the Spread of Medical Knowledge', in French and Wear (eds), *Medical Revolution*, pp. 272–93, at p. 288.

[9]*Philosophical Transactions*, 1668 (May 18), 35: 665.

[10]Ibid., p. 667.

natural Elements of Speech', that is, 'Motions of the parts of the Mouth', which he reproduced with the help of a plaster model,[11] were artificial. Languages, he wrote, arose 'when, by institution and agreement, such a composure of Letters, i.e. such a Word is intended to signifie such a certain thing'.[12] It was precisely because language arose 'by institution', however, that it should be possible to communicate the rules of its system to those who had been unable to acquire them from birth onwards through hearing and imitating. Indeed, while language was 'the most excellent Instrument for Communication ... of our Thoughts and Notions', speech was 'nothing else, than A sensible Expression and Communication of the Notions of the Mind by several Discriminations of utterance of voice'.[13]

Holder focused on what made communication possible in spite of the shortcomings of language. He did not investigate the reasons that might explain, theoretically at least, what these limits might be, or why they might be inscribed within the very nature of language, as some believed to be the case. His was an empirical, not a theoretical undertaking. Others around him, however, did focus on these speculative questions. Holder belonged to a group of linguists at Oxford of whom another prominent member was George Dalgarno (1626–87), author of the *Ars signorum*, a project for a universal language, and the *Didascalocophus*,[14] a didactic treatise aimed at the deaf. Other members included the mathematician, grammarian and linguist John Wallis (1616–1703), who, in parallel with Holder, also worked with the deaf and dumb (he would take on Holder's deaf-mute patient Alexander Popham after the boy's relapse),[15] and Seth Ward (1617–89), Savilian Professor of Astronomy at Oxford, a student at Wadham of John Wilkins, Bishop of Chester (1614–72). Ward and Wilkins together wrote a pamphlet, *Vindiciae Academiarum*, against proposals for educational reform by John Webster (1610–82),[16] set out by Webster in *Academiarum Examen, or the Examination of the Academies*.[17] Together with Wallis, Ward had also helped Dalgarno in his early effort to devise an 'investigation of Real

[11]See Rée, *I See a Voice*, pp. 107–20 for his account of the cures by Holder and Wallis.
[12]Ibid., p. 11.
[13]Holder, *Elements*, p. 17.
[14]George Dalgarno, *Ars signorum, vulgo character universalis et lingua philosophica* (London 1661); *Didascalocophus Or The Deaf and Dumb mans Tutor* (Oxford 1680).
[15]Ibid., Introduction, pp. i–ii. See also Rée, p. 108.
[16]John Wilkins and Seth Ward, *Vindiciae Academiarum, Containing, Some briefe Animadversions upon Mr Websters Book, Stiled The Examination of Academies. Together with an Appendix concerning what M. Hobbs, and M. Dell have published on this Argument* (Oxford 1654). The text of the 1654 edition is reprinted in facsimile in A. G. Debus, *Science and Education in the 17th Century: The Webster–Ward Debate* (New York and London 1970), pp. 193–259.
[17]John Webster, *Academiarum Examen: or, the Examination of Academies: Wherein is discussed and examined the matter, method, and customes of academick and scholastick learning, and the insufficiency thereof discovered and laid open; as also some experients proposed for the reforming of schools, etc.* (London 1653). The text is reprinted in facsimile in Debus, *Science and Education*, pp. 67–192.

Characters' (the *Ars signorum*),[18] which was sponsored by Samuel Hartlib (*c*.1600–62). Boyle, for his part, had taught himself shorthand 'in order to write up his experiments',[19] using a stenography,[20] in effect a primitive, workaday version of the 'Universal Character' John Wilkins was developing at the time. The Royal Society had commissioned from Wilkins the *Essay towards a Real Character and Philosophical Language* in 1662,[21] executed with the help of John Ray and Ray's collaborator Francis Willughby (1635–72) for the classification of animals and plants.[22] In short, this was a tight-knit community of natural philosophers, theologians, grammarians and mathematicans, embarked on a variety of interconnected projects whose theoretical underpinnings, whether implicit or explicit, concerned the relation between the order of nature and the modalities and significance of the human capacity to classify this order, mentally, linguistically and scientifically.

The preoccupation with the communicability of language, whether between individuals or between groups and nations, was thus intimately connected with a concern to find a way of reading the 'book of nature' and of communicating its contents in an intelligible way. There was intense disagreement – notably between Paracelsians, members of the Royal College of Physicians and scientists at the Royal Society[23] – over how and whether this 'book' could be opened in the first place, and over what conditions were necessary for the communication of information to be possible. Webster complained in his *Academiarum Examen* that 'Many do superficially and by way of *Analogy* (as they term it), acknowledge the Macrocosm to be the great unsealed book of God, and every creature, glory and power'; but no one could 'read the legible characters that are onely written and impressed by the finger of the Almighty'.[24] One possible remedy, thought Webster, for this alleged defect in the educational system of his day – an allegation that

[18]Samuel Hartlib mentioned this in his notebook-diary, *Ephemerides*, quoted by Vivian Salmon in 'The Evolution of Dalgarno's ''Ars Signorum''', in Vivian Salmon, *The Study of Language in 17th-Century England* (Amsterdam 1979), pp. 157–75: p. 161.

[19]Ibid., p. 164.

[20]John Wilkins had written an *Art of Stenography* (London 1628), a system of 'simple analogous symbols' in which 'new Illiterall Characters be inuvented and vsed for certained words: betweene which words and their Characters, appeareth some Analogie and proportion of reason'. See Salmon, *The Study of Language*, p. 160.

[21]John Wilkins, *Essay Towards a Real Character and a Philosophical Language* (London 1668).

[22]Ray and Willoughby produced a system of classification which would influence Carl Linnaeus, founder of modern taxonomy in natural history. See also Hans Aarsleff, 'The Royal Society: Hooke, Ray, Boyle, and Locke' in his *Language, Man and Knowledge in the Sixteenth and Seventeenth Centuries* (Princeton 1964), p. 126.

[23]See, for instance, Debus, 'The Paracelsians and Educational Reform', in his *Science and Education*, ch. 3, pp. 15–32 and David S. Lux and Harold J. Cook, 'Closed Circles or Open Networks? Communicating at a Distance during the Scientific Revolution', *History of Science* 1998, 36: 179–211.

[24]John Webster, *Academiarum Examen, or the Examination of Academies. Wherein is discussed and examined the Matter, Method and Customes of Academick and Scholastick Learning, and the*

Wilkins and Ward vehemently attacked in their reply to Webster – would be 'the discovery of the universal Character', a universal semantic system for the benefit of 'all mankind', enabling 'Nations of divers Languages' to have 'commerce and trafick one with another' and share each others' 'sciences and skill'.[25] It would, he wrote, 'have repaired the ruines of *Babell*, and have been almost a *Catholick* Cure for the confusion of tongues'. The deaf and dumbs' skill at using 'signes and gestures to express their minds' showed that it must be possible

> to convey our notions and intentions one to another, without vocal and articular prolation, as some have all ready invented and practiced by *Dactylogy*, and doubtlesly might be brought to pass by the eies and motions of the face onely. Sir *Kenelm Digby* hath an apposite, though almost incredible story of one in Spain, which being deaf and dumb, was notwithstanding taught to speak and understand others, which certainly was performed chiefly by the eye.[26]

Digby's account, in the section *Of Bodies* in his *Two Treatises*,[27] of the deaf and dumb Spaniard, Luis de Velasco, who had been able, '*chien savant'*-like, to lip-read and correctly render aloud Irish and Welsh words which he could not understand, was quite well known.[28] Dalgarno referred to it in his *Didascalocophus* in terms that assumed the reader's acquaintance with the anecdote, since he brushed over its details as if they were public knowledge.[29] And unlike Webster – who was dismissive of contemporary scientific efforts that did not promise the utopia of complete knowledge and total communication between all peoples and between macrocosm and microcosm – Dalgarno told the story in order to show the invalidity of its status as an experiment and expose its unlikelihood. Digby was known to tell 'fabulous and Hyperbolical' stories, as he put it, though in this case, it was 'not the *esse*, but the *posse* of the story, that I concern myself to maintain'.[30] Dalgarno was concerned throughout the work with evaluating the respective powers of the senses of sight and hearing, of determining who, of the deaf and blind, were more disadvantaged. He wanted to show that

*insufficiency thereof discovered and laid open; As also some Expedients proposed for the Reforming of Schools, and the perfecting and promoting of all kind of science* (London 1653), p. 28.

[25]Webster, *Academiarum Examen*, pp. 24–5.

[26]Ibid., p.25.

[27]Sir Kenelm Digby, *Two Treatises: In the one of which, the nature of bodies; In the other, the nature of mans soule, is looked into: in way of discovery of the immortality of reasonable soules* (Paris 1644; London 1645): 'The First Treatise declaring the nature and operations of bodies', pp. 307–9.

[28]See Rée, *I See a Voice*, pp. 98–9.

[29]George Dalgarno, *Didascalocophus Or The Deaf and Dumb mans Tutor* (Oxford 1680; reprinted Menston, 1971), pp. 37–40.

[30]Ibid., p. 40.

'Dactylology' and 'Cheirology' – a language of signs and a system of gestures respectively – might be the means with which the deaf-mute, given adequate instruction, could communicate, and that it was possible to instruct even those who had been deaf from birth to use this semantic system, this particular 'Schematology'.

The concern with the ability of human language to signify adequately, in this sensitive period of adjustment to new modes of learning and discovering, was matched with varying definitions of what was most characteristic of language.[31] On one view, it was fallen, but could be improved upon, as Dalgarno thought,[32] for example by weeding out scholastic obscurities. On another view, it was fallen because fragmented into innumerable versions; but it was also possible to return to the pure, Adamic unity of word and thing of the kind Webster wished for, by investigating etymologies (as suggested by Jakob Boehme), and by creating, as Wilkins tried to do,[33] a 'philosophical language' based on a 'real character'. Such a 'real character' consisted in the elaborate classification of concepts which would reflect reality and the 'syntactical relations between concepts',[34] just as mathematics or Chinese ideograms did. Joseph Glanvill would attack the conceit of mistaking 'the infusions of *education*, for the principles of universal *nature*', which denoted the absence 'of a *scientifical Theory*'.[35] On yet another view, taken by John Locke,[36] one could evaluate

[31]There is an extensive literature on universal languages, universal grammars, universal characters and philosophical languages. See, in S. Auroux (ed.), *Histoire des idées linguistiques, vol. II: Le développement de la grammaire occidentale* (Liège 1994): 'Les questions de l'âge de la science', esp. Vivian Salmon's account of the tradition, 'Caractéristiques et langues universelles', pp. 407–23, and Marc Dominicy's bibliographical essay on the history of grammar, 'Le programme scientifique de la grammaire générale', pp. 424–41. See also James Knowlson, *Universal Language Schemes in England and France, 1600–1800* (Toronto 1975); Mary M. Slaughter, *Universal Languages and Scientific Taxonomy in the Seventeenth Century* (Cambridge and New York 1982); Umberto Eco, *La Ricerca della lingua perfetta nella cultura europea* (Rome and Bari 1993).

[32]On the very first page of his introduction to the *Didascalocophus*, Dalgarno referred to his goal when publishing the *Ars signorum* some twenty years earlier, of 'shewing a way to remedy the difficulties and absurdities which all languages are clogg'd with ever since the confusion, or rather since the fall; [...] to cure even Philosophy it self of the disease of Sophisms, and Logomachies'.

[33]The literature on Wilkins's *Essay* is extensive. See, for example, Sidonie Clauss, 'John Wilkins' Essay Toward a Real Character: Its Place in the Seventeenth Century Episteme', in Nancy Struever (ed.), *Language and the History of Thought* (Rochester 1995), pp. 27–49; Vivian Salmon, '"Philosophical" Grammar in John Wilkins's *Essay*', in her *The Study of Language in 17th-Century England*, pp. 96–125; Van Leeuwen, *The Problem of Certainty*, esp. pp. 49–71.

[34]See Salmon, *Caractéristiques*, in Auroux (ed.), *Histoire*, p. 410.

[35]Joseph Glanvill, *The Vanity of Dogmatizing: Or Confidence in Opinions. Manifested in a Discourse of the Shortness and Uncertainty of our Knowledge. And its Causes, With some Reflexions on Peripateticism; And an Apology for Philosophy* (London 1661), p. 132.

[36]John Locke, *An Essay concerning Human Understanding* (London 1690), P. H. Nidditch, (ed.) (London 1975), III, 2–4.

language not as what it had once been, nor as what it should be, but by trying to understand its relation to the formation of knowledge.[37]

It was through our senses, primarily vision, that we could acquire knowledge of the book of nature – just as language was the key to reading the book of Scripture and, for some, to unlocking its secrets. But the relation of our senses to our ability to decipher signs must itself be an object of investigation. Our senses provided the information; yet that information had to be processed by the mind, which somehow bridged the different kinds of information which each sense delivered and unified them into one concept, sign or universal. The chief characteristic of the human mind was, then, its ability to process sense-data and use language, an intricate system of abstract signs inaccessible to animal minds. Holder accepted that 'Thousands of Signes may be invented and agreed upon, and learnt, and practiced' – from bells and trumpet calls to facial expressions, pointing and knocking – which the dumb were good at using and which animals made use of too, 'to Call, Warne, Chide, Cherish, Threaten, *&c*., especially within their own kinds'. Nevertheless, the human voice and the alphabet were the 'chief' of all signs. Only man was endowed with speech,

> as with an Instrument suitable to the Excellency of his Soul, for the most easie, speedy, certain, full communication of the Infinite variety of his Thoughts, by the ready Commerce between the Tongue and the Ear. And if some Animals, as *Parrots, Magpies, &c*. may seem to be capable of the same discriminations, yet we see, that their souls are too narrow to use so great an Engine.[38]

That animals could not express themselves in the way that humans could was at first an Aristotelian assumption, and it held water despite the contrary assertions made in the sixteenth century by Michel de Montaigne and Pierre Charron (1541–1603).[39] We humans had the prerogative of language, through which we made use of our reasoning faculties. For Holder, Wallis and Dalgarno, sign-language was a human language too, a semantic system constructed on the basis of an analysis of semantic function. For the physician John Bulwer, the author of a *Chirologia, or, the Naturall Language of the Hand*, a *Philocopus, or the Deaf and Dumbe Mans Friend*,[40] natural language consisted of the languages of the body; and their

[37]See, for example, Lia Formigari, 'Le langage et la pensée', in Auroux (ed.), *Histoire*, pp. 442–54. On the respective positions of Locke and Leibniz with regard to language, see Hans Aarsleff's seminal article 'Leibniz and Locke on Language', *Philosophical Quarterly* 1964, 1:165–88; reprinted in his *From Locke to Saussure. Essays on the Study of Language and Intellectual History* (London and Minneapolis 1982), pp. 42–83.

[38]Holder, pp. 4–6.

[39]See Michel de Montaigne, *Essais* (Paris 1580), II, xii, 'Apologie de Raymond Sebond'; Charron, *De la sagesse* (Paris 1601), esp. Bk. 1.

[40]John Bulwer, *Chirologia, or, the Naturall Language of the Hand: Composed of the speaking motions, and discoursing gestures thereof. Whereunto is added, Chironomia; or, The art of manual*

various versions could be catalogued, grouped, analysed and used to teach the deaf and dumb how to communicate. Gesture was a declamatory technique, and like all techniques, it could be mastered.[41] Controlled, modulated gesture, like controlled, modulated voice, was the rhetorician's tool. Nature could be read without the use of instituted signs; eloquence, however, required nature to be tamed.

Natural, sign-free expression was one mode of expression, however limited; it might also have been the starting-point for any language and indeed for any sign language. The question then arose of whether thought might actually exist without language – of whether it was possible to conceive of thought as independent of semantics. If so, it was even possible to say that thought was clearer when it was not rendered 'into' language. If our language was so imperfect, and if the Hermetic tradition, as Webster was inclined to believe,[42] revealed the truths obscured by thought-processes steeped in scholastic logic, the shortcomings of human reason were equal to the inadequacy of language in the task of understanding the universe. Inversely, if language was adequate, an analysis was needed of the operations through which we came to know and describe the world verbally.

The very notion that a deaf and dumb person could actually learn how to speak was difficult to comprehend theoretically, especially if one did not use the plausible notion, favoured for example by Bulwer, that all senses were equivalent. There had been attempts at teaching the deaf how to speak and read from the sixteenth century onwards;[43] and the idea that the body could by default stand in for the voice goes back at least to Plato.[44]

Views about the nature of language in the seventeenth century were inseparable from a metaphysical standpoint with regard to God, soul and body, the traditional subjects of philosophy and those which Descartes had revolutionized. But individual discussions of linguistic function such as those of Dalgarno, Holder, Wallis and Wilkins were meant to accomplish particular, potentially concrete and in a specific sense 'scientific' tasks.[45] On the whole, these men, as one commentator has put it, have not been

*rhetoricke* (London 1644). Bulwer also wrote a *Philocopus, or the Deaf and Dumbe Mans Friend* (London 1648) and a *Pathomyotamia, or, A dissection of the significative muscles of the affections of the minde* (London 1649).

[41]On Bulwer, see Rée, *I See a Voice*, pp.123–31.

[42]See Debus, *Science and Education*, pp. 33–64.

[43]Rée, in *I See a Voice*, gives a history of such attempts; see especially chs. 9–13 and references.

[44]Oliver Sacks, in *Seeing Voices* (London 1991), pp. 14–15, refers to a passage from the *Cratylus* (422d–423b) quoted by the Abbé de l'Epée, the official founder of sign-language in eighteenth-century France:

> If we had neither voice nor tongue, and yet wished to manifest things to one another, should we not, like those which are at present mute, endeavour to signify our meaning by the hands, head, and other parts of the body?

[45]Dalgarno was the first to create a manual alphabet – dactylology – for the deaf, though John Bulwer preceded him in devising a complete sign language, or arthrologie, in his *Chirologia* and

'remembered for their scientific accomplishments', although 'they had an interest in certainty relative to a scientific theory'.[46] Their discussions rested on some *assumptions* about language and raised philosophical questions precisely because an empirical approach could not elucidate the nature of the relation of word and thing, in a way that theorists, including the Port Royal thinkers, tried to do. Indeed, the first paragraph of the first part of the *Logique* by Antoine Arnauld (1612–94) and Pierre Nicole (1625–95) established that: 'Since we cannot know anything outside outselves without the mediation of the ideas within ourselves, thoughts we can have about our ideas might be the most important part of logic, because it is the foundation of everything else.'[47]

Earlier, Francis Bacon had developed his theory of language, understanding oral but also written and gestural language as the means for the communication of 'rational knowledge'.[48] Gesture enabled communication between the deaf and dumb and between people 'that understand not one another's language'.[49] Both words and gestures were 'notes of cogitations'.[50] But whereas words were 'the tokens current and accepted for conceits, as moneys are for values',[51] gestures, like hieroglyphics, bore a similarity to the concept they pointed to, like 'impresses and emblems', and 'an affinity with the things signified'.[52] For Bacon, the bodily language of the deaf and dumb would have been superior to the spoken word, which, as a result of the curse of Babel, required grammar in order to function. In his view, as for some of the later creators of a universal character, languages and their grammars resulted from 'the second general curse, which was the confusion of tongues'.[53] Language was our organ of expression, and it functioned well enough; but its grammar was arbitrary and imperfect, and so reflected the inadequacy with which the intellect interpreted sense-data. Errors of judgement were due to these errors of the intellect.[54] Logical propositions did not capture the subtleties of the natural world precisely because

*Philocophus* (1648). For a brief account of the significance of Dalgarno, Bulwer, Holder and Wallis in the development of BSL (British Sign Language) see J. G. Kyle and B. Woll, *Sign Language: The Study of Deaf People and their Language* (Cambridge 1988), pp. 37–57.

[46]Van Leeuwen, *Problem of Certainty*, p. 48.

[47]Antoine Arnauld and Pierre Nicole, *La logique ou l'art de penser* (Paris 1662), Pierre Clair and François Girbal (ed.) (Paris 1981), p. 39.

[48]In this he followed Aristotle, *De interpretatione*, 16a3, citing his notion that 'Words are the images of cogitations, and letters are the images of words'. See Bacon, *Of the Proficience and Advancement of Learning, Divine and Humane* (first published London, 1605), G. W. Kitchin (ed.) (London 1861; reprinted 1973), XVI, 1, p. 36.

[49]Ibid., XVI, 2, p. 137.

[50]Ibid., XVI, 3, p. 137.

[51]Ibid., XVI, 3, p. 138.

[52]Ibid., XVI, 3, p. 137.

[53]Ibid., XVI, 4, p. 138.

[54]Ibid., XIII, 4, p. 126.

'arguments consist of propositions, and propositions of words', which were the mere tokens of things.

For Bacon, the necessity of interpretation and its arbitrariness coexisted. It was the recognition of the limits of the intellect (rather than those of the senses) that, according to him, could allow one to base the pursuit of knowledge on firm ground by revising the errors that undermined the efficacy of language. His position implied a commitment to the notion that there could be such a thing as a true account of nature, but that the form in which such an account existed was liable to be problematic. Although it could be improved upon, it was discourse that was the source of confusion and error, not perception, nor the human capacity to find out how things worked. There were echoes of this notion in Hobbes, for whom the understanding was 'nothing else, than conception caused by speech'.[55] Words were the means 'whereby men register their Thoughts; and recall them when they are past; and also declare them one to another for mutuall utility and conversation'.[56] But while names signified concepts and speech transformed thought into words,[57] names themselves were 'of *inconstant* signification'.[58] To reason, moreover, was to deduce or induce these words from each other, from particulars to universals and back; and the process was not error-proof.[59]

The notion that truth and falsity were primarily features of propositions, rather than of facts, amounted to an emphasis on the linguistic basis of our knowledge of the world and on its grammatical and mentally effected configuration. For Hobbes, scientific knowledge was inductive and thus merely hypothetical. It consisted in the possibility, inscribed within the very nature of language,[60] of inferring general facts from particular cases.[61] Whether Hobbes was sceptical of the Royal Society's programme for scientific investigation because it could only be shared through discourse, or whether it was the very arbitrariness of linguistic constructs and their

[55]Thomas Hobbes, *Leviathan, or the Matter, Forme, & Power of a Common-Wealth, Ecclesiasticall and Civill* (London 1651), C. B. Macpherson (ed.) (London 1981), p. 109 (I.4).
[56]Ibid., p. 100.
[57]Ibid., p. 101. See Ian Hacking, *Why does Language Matter to Philosophy?* (Cambridge 1975), pp. 15–25, for a discussion of Hobbes's theory of language.
[58]Hobbes, *Leviathan*, pp. 109 and 165 (I.11).
[59]Ibid., p. 113. See also Hobbes, *Elements of Philosophy* (London 1656), Part I, *On Computation or Logic*, 'Of Names', in Hobbes, *The English Works*, Sir William Molesworth (ed.) (London 1839), I, p. 16:

> A Name is a word taken at pleasure to serve for a mark, which may raise in our mind a thought like to some thought we had before, and which being pronounced to others, may be to them a sign of what thought the speaker had, or had not before in his mind. And it is for brevity's sake that I suppose the original of names to be arbitrary.

[60]See Shapin and Schaffer, *Leviathan and the Air Pump*, p. 92.
[61]For a discussion of Hobbes's views on the relationship between language and scientific knowledge, and on the ways in which they bear upon his understanding of scientific inquiry, see Douglas Jesseph, 'Hobbes and the method of natural science', in Tom Sorell (ed.), *The Cambridge Companion to Hobbes* (Cambridge 1996), pp. 86–107, especially pp. 96–102.

dependence upon logical and grammatical rules that signified, in his view, the inevitability of epistemological opacity, is not a question that can be addressed here. But it is important to point out how connected the two issues were in the minds of those figures whose discussion of the nature of knowledge took place not merely in a continuum with the traditional concerns of philosophy, but also within the context of debates about the status of a novel kind of scientific enquiry, which was yielding new information about the structure of the physical world.

Dalgarno, in contrast to Bacon's view of Babel as the farewell to linguistic purity and unity, and with none of the concern he had displayed in the *Ars signorum* to reflect in philosophical terms on the fallibility of language, along the lines followed by Hobbes, stated in his *Didascalocophus* that 'tho there be no affinity between the words of some languages; yet there is something of a Natural and Universal Grammar runs thro all Languages, wherein all agree'.[62] Languages, he thought, along with his 'worthy friend Dr. Wallis',[63] were 'guided by the instinct of Nature'. Many words were formed as if 'there is something Symbolizing, and Analogous to the notions of the things; which makes them both more Emphatic, and easy to the memory'. Written words, however, were 'a meer arbitrary Institution', and 'because speaking being before writing, has more of Nature and less of Art in it'.[64] Both Dalgarno and Holder, in devising in their manuals a method for teaching language to the deaf from scratch as well as a sign-language that would enable the deaf-mute to communicate, manifested little if any doubt about the feasibility of their project, born, clearly, of the mix of 'Art' and 'Nature', and aimed at the improvement of the latter. The notion of a sign-language in Dalgarno was conceived on the same grounds as was the 'shorthand' in his earlier *Ars signorum*, which originated, he said in the *Didascalocophus*, from his awareness that Hebrew alone was diphthong-free, hence probably very close to Adam's tongue.[65] It was the compactness of Hebrew that gave it its elevated status, in the same way that the elegance of a mathematical demonstration was a function of its concision. Dalgarno seemed committed to the idea that there once was an Adamic language, now lost, but preserved to some extent in Hebrew and a plausible source of inspiration for new methods of communication.

What is most striking both in Holder and in Dalgarno is the absence of debate about the foundations of such a view. Hearteningly optimistic and, to a point, efficacious as they were, both these attempts took for granted the

[62]Dalgarno, *Didascalocophus*, p. 18.

[63]Wallis, along with Seth Ward, was deeply hostile to Hobbes, and both Royal Society Fellows engaged in a heated debate with him that began after the publication of Hobbes's *De corpore* in 1650. For an analysis of the nature and significance of the conflict, and an account of the available sources, see Shapin and Schaffer, *Leviathan and the Air Pump*, esp. pp. 106, 126, 131–54, 311–12, 323–31.

[64]Dalgarno, *Didascalocophus*, pp. 20–1.

[65]Ibid., pp. 100–1.

assumption, stated by Holder, that language, as the manifestation of reason, was a system of signs superior to others that distinguished us from the animal world, even though its mode of transmission was physical and so comparable to animal forms of communication. It is in this sense that theoretical presuppositions determined the practices of natural philosophy, and that experiment and thought-experiment did not mix in an obvious way.[66] Enquiries about the ways in which access to the linguistic faculty might be impaired in beings whose very nature was defined by the ability to use language, however, inevitably turned on questions regarding the connection reason bore to both the human creation of meaning and the physiology of perception.

The view that anomalous sense-perception could tell us something about the nature of cognition and mind was implicit in some early accounts of individual cases.[67] Galen, for example, had already been able to observe the correspondence of lesions in the brain to changes in behaviour.[68] Descartes, for his part, would note that when the brain suffered lesions, the senses alone were affected, while the body was able to remain mobile.[69] But he had no problem explaining this in terms of his dualism, stated for example in the *Dioptrique*, that it was the *soul* which perceived ('sent'), not the body, and that, lodged in the pineal gland, or *conarium* (as the 'common sense', the medieval *sensorium commune* or *sensus communis*), it received there the sense-perceptions transmitted by the nerves. Just as his *Meditations* began with scepticism about the reliability of the senses, so his account in the *Dioptrique* of the nerves' mechanism differed sharply from Locke's inquiry about the nature of sense-experience. Empiricists and rationalists, then, shared the assumption that perception, or sensation, must be conscious – that without a mental operation it did not exist as perception or sensation. But they differed in their notion of how perception and thought were connected.

[66]See Catherine Wilson, *The Invisible World: Early Modern Philosophy and the Invention of the Microscope* (Princeton 1995), pp. 3–38, esp. p. 10; Peter Dear, *Discipline and Experience: The Mathematical Way in the Scientific Revolution* (Chicago 1995). On the definition and function of thought-experiments, see Shapin and Schaffer, *Leviathan and the Air Pump*, p. 55, n. 62, and Thomas Kuhn's 'A Function for Thought Experiments', reprinted in his *The Essential Tension: Selected Studies in Scientific Tradition and Change* (Chicago 1977), pp. 240–65, to which Shapin and Schaffer also refer and in which Kuhn analyses what kind of knowledge can be gained from thought-experiments.

[67]The theory needed to underpin such a notion was hardly available until the nineteenth century, but Hobbes, in *Leviathan*, pp. 103–4 (I.4), invoked the case of

> a man that hath no use of Speech at all (such, as is born and remains perfectly deafe and dumb)' to explicate the way in which, by imposing names, 'we turn the reckoning of the consequences of things imagined in the mind, into a reckoning of the consequences of Appellations.

[68]See Galen, *De placitis Hippocratis et Platonis*, I.6.

[69]Descartes, *Diotrique*, in Alquié (ed.) *Oeuvres philosophiques*, I, pp. 681–2 .

Descartes had staked all on the belief that thought alone could counteract doubt about the veracity of sense-perception, while holding that the senses could only convey information about the way in which objects and their primary as well as secondary qualities were experienced, not about their nature. Locke, on the other hand, believed that objects first affected our senses, causing 'perceptions in the Mind' and 'thereby produce in the Understanding a simple *Idea*'.[70] Ideas, however, were not

> exactly the Images and Resemblances of something inherent in the subject; most of those of Sensation being in the Mind no more the likeness of something existing without us, than the Names, that stand for them, are the likeness of our Ideas, which yet upon hearing, they are apt to excite in us.[71]

Lockean ideas, then, resembled the objects they were images of as much as words resembled the things they designated.[72] This was, for Locke just as it had been for Bacon, an instituted relation related to the notion of intelligibility (thus, 'the Names of Colours to a blind Man, or Sounds to a deaf Man' were unintelligible),[73] although we functioned by the fixed and acquired rules that rendered sounds or letters meaningful and that turned sense-data into the primary elements of cognition. Locke's ideas were not images, as he repeatedly pointed out; but they did play the role of a conceptual *deus ex machina* of sorts, a self-explanatory token with which he could account for the possibility of experiencing subjectively a world of objects and qualities. These ideas thus established an equivalence between the experience and the concept, itself the reified problematization of mental representation. To a degree, they were the embodiment of the physical phenomenon of perception, and on the picture of the mind of which they were a part, language could only operate in relation to them. Verbalization was thus studied as an aspect of mental discourse necessary to its very transmission, rather than as the manifestation of higher cognitive capacities. The 'Communication of Thoughts' and of the 'invisible *Ideas*' that made up thoughts was essential to what Locke called the 'Comfort, and Advantage of Society'. This was why he wanted to analyse how words which were 'by Nature so well adapted to that purpose' became the signs of ideas, 'not by any natural connexion ... for then there would be but one language amongst Men; but by a voluntary Imposition, whereby such a Word is made arbitrarily by the Mark of such an *Idea*'. Words were 'the sensible Marks of *Ideas*; and the *Ideas* they stand for, are their proper and immediate Signification'.[74]

[70]Locke, *Essay*, II.viii.1.
[71]Ibid., II.viii.7.
[72]For a provocative discussion of what one can understand to have been meant in the seventeenth century by the notion of 'idea', see Hacking, *Why Does Language*, pp. 26–42.
[73]Locke, *Essay*, III, ix, 5, p. 477.
[74]Locke, *Essay*, III.ii.1. For an analysis of Locke's point here and in the subsequent passage, see

Intrinsic to this view of the role of language was the notion that mental discourse was private; that it preceded what one may term public discourse; that it stood in a relation of correspondence to ideas; and that ideas themselves corresponded to the objects of thought, whether these objects were abstract or concrete. As for thought, Locke described it in these terms: 'When the Mind turns its view inwards upon it self, and contemplates its own Actions, *Thinking* is the first that occurs. In it the Mind observes a great variety of Modifications, and from thence receives distinct Ideas.'[75] The mind itself was not the main actor. The world and its objects principally made impressions upon it, and thought was the apprehension of the modifications of mind that impressions provoked: thought was an aspect of consciousness.[76] On such a view, the understanding was the sum of cognitive functions; but it was difficult to understand how these functions worked, or how they came to be what they were. Locke's epistemology, as presented within his account of language and cognition, offered a precise description of the genesis of knowledge, which, however, did not so much serve a scientific end as constitute a solid basis for a project that was informed by, and encompassed, wider social and political concerns. Taken on its own, the Lockean notion that we came into the world with a so-called *tabula rasa* for a mind, that perception was necessary to knowledge and that no knowledge was innate, remained open to questions as would be, in our own time, the parallel notion that we are born with fully equipped, pre-programmed minds whose development is not in some way dependent on the environment. Locke's epistemological solutions, some of whose implications we shall return to later on, posited our capacity for knowledge as intrinsically limited; but there was little room within these solutions for a precise account of our perceptual and cognitive structures.

To accept that the deaf could learn how to speak was not necessarily to hold a theory about the linguistic faculty. If, nevertheless, one were to explain how it was that words could be physically reconstructed, with the help of a teacher but without having been perceived by any senses, this very aspect of the linguistic faculty begged the question of its theoretical underpinning. What the theory would be *of* was unclear, since it needed not just to prove *that*, but to explain *how* a deaf person could be taught how to speak. A Platonist, 'nativist' doctrine of knowledge might serve as a general theory of human nature, one that ran counter to Locke's. Such a doctrine, however, jarred with the Baconian programme of enquiry since there was no available way of formalizing the process and methods of its empirical investigation. Visual evidence offered by dissection had been the subject of

Frank Jackson, 'Learning from Locke on Voluntary Signs', the transcript of a *Talk at the Moral Sciences Club* (Cambridge 1998) at http://philrsss.anu.edu.au/people/people-defaults/fcj/learn.html.

[75]Locke, *Essay*, II.xix.1.

[76]Locke was the first to try to recognise consciousness as a phenomenon that could be discussed and described, primarily in terms of personal identity. See *Essay*, II.xxvii.17.

speculative study since Vesalius; but these explorations of lifeless flesh could only make it possible to view parts of functional systems, natural processes and physical mechanisms: not provide an overall conception of the mode in which higher faculties depended upon the physical organism. Conclusions about the order of explanation – about what would have counted as a valid fact about cognition generally – and about the nature of the explanandum – here, the role of senses in the operations of human cognition – were related, but the mode of their causal implication was not determined by evidence.[77]

Within the accounts described here, organs of sense were always acknowledged as necessary for cognition. The elaborate linguistic function at the heart of our mental activity clearly manifested itself through physical signs and gestures as well as through the capacity to conceptualize, or the evolved tendency to do so.[78] But these accounts did not have the explanatory yield to fill in the gap between the understanding of the human organism as its own end, autonomous from God, and the picture of man as a creature of God. This might explain why natural theology tended to be well served by natural philosophy without any sense that the latter's chief role might be anything other than to celebrate God's creation, as attested for example by the popularity of the naturalist John Ray's (1628–1705) *The Wisdom of God Manifested in the Works of the Creation*,[79] or by the Anglican clergyman and physician William Derham (1657–1735), in the sermons he preached in London as the Boyle Lectures in 1711 and 1712.[80] Concepts which accounted for the ontological and epistemic gap between objects in the human mind and objects in the physical world did not reduce the gap's scientific unintelligibility; in effect, the very possibility of modern, Baconian science depended on this gap, 'so differing an harmony there is between the spirit of Man and the spirit of Nature', as Bacon himself put it.[81] Questions about the nature of sense-perception, when illustrated by cases in which certain modes of perception were altered or, as with deafness, non-existent, remained interrogations about the mind's autonomy from the physical world and from the body. Dualism, in the form of the doctrine set out by Descartes, was one response to these interrogations; but debates concerning it were characteristically theoretical, theological and ideological.

[77]See Peter Dear, *Discipline and Experience: The Mathematical Way in the Scientific Revolution* (Chicago 1995), pp. 153–6, for an exposition of the same point.

[78]The notion of an evolved tendency was described, for example, by Kenelm Digby, who, in his popular pamphlet on the powder of sympathy, referred to a question he attributed to Plutarch, of whether horses run fast because the fastest horse escapes from the wolf at his heels. See *A Discourse made in a Solemne Assembly of Noble and Learned Men at Montpellier in France, by Sir Kenelme Digby, Knight &c., Touching the cure of wounds by the powder of sympathy,* 2nd edn (London 1658), pp. 2–3.

[79]London 1691.

[80]These were collected as *Physico-Theology: Or, A Demonstration of the Being and Attributes of God, from his Works of Creation* (London 1713). Derham also edited works of John Ray and Robert Hooke's *Philosophical Experiments* (London 1726).

[81]Bacon, *Advancement*, XIV, 9, p. 133.

The gap at the centre of dualism was a condition, rather than a matter for empirical investigation.

The relationship between the formation of new tools for the observation of the world and the use of older conceptions of the mind was thus complex and often uneasy. The assumption that language was the manifestation of thought-processes was common-sensical enough to recur throughout the history of speculations about language. And as we shall see now, the view that higher-order, verbal thought was a priori a property of human nature was popular across the Channel among Cartesian property dualists, who advanced it in order to enforce their picture of the mind–body relation.

## II. DISEMBODIED THOUGHTS

In 1684, Bishop Bossuet's pious friend and protégé François de Salignac de la Mothe Fénelon (1651–1715) wrote – a few years before being named tutor to the Grand Dauphin, son of Louis XIV, and at the instigation of the abbé Claude Fleury – a treatise on the education of girls, *De l'éducation des filles*.[82] The text gives general, commen-sense advice on how to bring up children, regardless of gender, and in this respect it has not aged much. But it also represents a compromise between the progressive wishes of educated women at the time[83] and conservative views regarding what was commonly seen as their natural weakness, on account of which their educational requirements could not equal those of boys. Girls, said Fénelon, could turn idle if given too much licence in their youth; and with time on their hands they might become the bathetic victims of their own inappropriate curiosity, like the 'précieuses'.[84] Here is how he thought one should attend to the need to teach children – and girls in particular, naturally inclined as they were, he wrote, to focus on their bodies – that 'our soul is more precious than our body', indeed that the two were 'distinct':

> Ask a child who is already able to use reason: is it your soul that eats? If he gives the wrong answer, do not scold him; but tell him gently that the soul does not eat. The body, you will tell him, is what eats; it is the body which is similar to beasts. Do beasts have a mind? Are they knowledgeable? *No*, the child will reply. But, you will go on, they eat, although they have no soul. Thus you see that the mind does not eat; it is the body which takes in meat to nourish itself;

[82]Fénelon, *De l'éducation des filles* (Paris 1684; here, Lyon 1804).

[83]For a contextualized evaluation of egalitarian, 'feminist' thought in Cartesian circles through the case of Poulain de la Barre, see Siep Stuurman, 'Social Cartesianism: François Poulain de la Barre and the Origins of the Enlightenment', *Journal of the History of Ideas*, 1997, 58: 617–40.

[84]Ibid., p. 2. In his *Panégyriqe de Sainte Catherine* (Paris 1660), Bossuet (1627–1704) wrote that women should avoid acquiring solid scientific knowledge not because it was beyond their means, but because doing so would be 'une épreuve trop dangereuse pour leur humilité'. See *L'éducation des filles* in Fénelon, *Œuvres*, ed. by Jacques Le Brun (Paris 1983), I, p. 1271, n. 5.

> it is the body which walks and sleeps. And what does the soul do? It reasons, it engages with the world; it likes some things and has an aversion to others.[85]

Put like this, it made sense to posit the duality of mind and body. A child might easily have been convinced that a physical body did not exist in the same mode as that which the adult called the soul – or Cartesian mind – and that the body's needs differed in kind, and qualitative degree, from the soul's non-physical ones. It was simple enough, in this way, to match a hierarchy of functions to their division, and a dualist ethics to a dualist ontology. But there were difficulties inherent in assuming this simplistic mind–body dualism, because the senses were necessary for perception, and something in the human organism must have been going on for sense perception to be associated with the creation and rational use of sense-data. Speculation about visual and sound recognition was concerned with operations of sense-perception. Whatever belief one held about the specific nature of the correlation between mind and body, they were one aspect of the study of the perceptual and, inevitably, mental life of sentient creatures.[86] The problems of accounting for these realities within the dualist postulate and orthodoxy were at the core of the theoretical debates accompanying the absorption of the Cartesian doctrine.[87]

Fénelon emphasized that the high receptivity of small children, not really explainable except by the softness of their brain, indicated that early childhood was the period 'at which the deepest impressions will be effected', and 'therefore is of significance to all the rest of life' (it was for this reason that he considered it a great mistake to entrust young children to governesses).[88] A child's brain was 'like a lit candle in a windy place. Its light flutters constantly.'[89] Children's learning capacities at that point were great, since they were about to acquire language and would do so better than a scholar would ever master a dead language over which he had sweated for years. But, he asked:

> what is it to learn a language? It is not merely to consign to memory a great number of words; it is also, as Augustine said, to look out for the meaning of each of these words. In the midst of his cries and games, the child, he says, notices the object of which each word is the sign; he does so at times by watching the natural movements of the bodies that touch them, or that point to the objects referred to; at other times by noticing the frequent repetition of

[85]Fénelon, *De l'éducation*, p. 98.
[86]See Pastore, *Selective History*, pp. 19, 30–2.
[87]On the history of reactions to Cartesianism see, for example, Albert G. A. Balz, *Cartesian Studies* (New York 1951) and the useful collection by Vere Chappell (ed.), *Essays on Early Modern Philosophers: Cartesian Philosophers* (New York 1992). See also John Sutton, *Philosophy and Memory Traces: Descartes to Connectionism* (Cambridge 1998), esp. chs. 5–9.
[88]Fénelon, *De l'éducation*, (ed.) 1804, p. 15.
[89]Ibid., p. 36.

> one word to refer to the same object. It is true that the temperament of a child's brain allows for the admirable ease of impression of all these images. Nevertheless, much attention is needed to discern them and to attach each of them to its object.[90]

According to Fénelon, language acquisition began before words were actually identified by the child: emotions were present from the very beginning of life, and so signalled the propensity to learn language in so far as they were one mode of relation with objects in the world. If Fénelon did not actually say this, it was mainly because his concern was to give parents and educators a practical treatise about childcare. Moreover, his point was that children's moral education began early, whether or not, presumably, they were able to understand the meaning of a word like 'soul', and as long as they could identify the word 'doll' with the object it denoted. The assumption here seems to be that cognition was not buried solely within the linguistic faculty, since emotions were one form of cognition. Again he referred to Augustine, who once saw 'a jealous child; he could not yet speak, and already he stared, pale-faced and with a gaze full of anger, at the child that was nursing with him'.[91] This meant, according to Fénelon, that one could assume 'children know more than one usually imagines'[92] and would understand, before their linguistic faculty was actually formed, whatever one signalled to them with words and gestures.

Most parents would have no trouble recognizing the truth of this. But it was less evident to find theories capable of sustaining a satisfactory explanation of *what* language acquisition was, and of what, more generally, our capacity to conceptualize amounted to. The question remained: what turned our inner mental discourse[93] into information about the concrete world? That humans alone were endowed with this capacity was not necessarily a given either: it was possible to hold that animals might equally be endowed with information processing abilities, given that they too had senses and a nervous system, and had to function in the world. We have seen earlier the problems which emerged when it was claimed that such abilities could exist only if they were made manifest through verbal expression. For late Cartesian dualists such as Fénelon, the preservation of the specialness of

[90]Ibid., pp. 15–16. See also Augustine, *Confessions*, I.8.
[91]Ibid., p. 17.
[92]Ibid.
[93]The distinction between a 'language of thought', in the sense coined by Jerry Fodor in *Language of Thought* (Cambridge, Mass. 1975), and grammatical language is of course not new and goes back to Plato. In *Leviathan*, towards the beginning of I.3, Hobbes explicitly differentiated a 'mental discourse', which he assumed animals possessed as well as humans, from the 'discourse in words' established by humans themselves. He made a congruent point in *De homine* (1658), X.2: *Traité de l'homme*, ed. by Paul-Marie Maurin. (Paris 1974), p. 144: Adam *chose* to taste the tree of knowledge before there was any language in which God's entreaty could be expressed.

humans, created in the image of God, was at stake here. It was clear to all that animals saw, smelled and heard. To most, except for the radical exponents of the new mechanist orthodoxy, animals had sensations and emotions, too, and seemed in some way or other to be able to communicate. But this did not signify that human cognitive capacities were similar to those of animals. According to the dualist view, one vital reason for this difference was that, however much these capacities were embedded in bodily life, one could account for them solely within the framework of the Cartesian system and its variants. Given the obligatory conceit of our possession of a rational soul, the issue of determining who or what was able to form ideas and concepts was determined by the question of the origin of this capacity and of its mode of acquisition. This question, in turn, was ideologically loaded.

The separate status of our immaterial, rational soul allowed the physical world and its knowability to be defined in terms of the human capacity for accurate perception and conscious thought, on the one hand, and provided the theoretical justification for doing so, on the other. This is why, as I have suggested earlier on, Locke's focus on the *consequences* for human knowledge of the need for sense-perception differed so much from the Cartesian focus on the actual mechanisms of sense-perception and language use. Moreover, speculations about cognitive functions seem to have been independent of the ordinary observation of ordinary emotions. So, for Fénelon, children had an emotional life before they were able to talk about it; and for everyone on either side of the animal soul debate, animals did at least manifest emotions and behave in such a way that one was able, perhaps compelled to ascribe emotional states to them. Certain forms of behaviour were recognized as bearing an emotional content or meaning and it was assumed that they could be interpreted as immediate responses to events and objects in the environment.

Gérauld de Cordemoy (1628?–84),[94] a celebrated lawyer and Cartesian thinker, expressed opinions similar to those of Fénelon with regard to a child's acquisition of language, in his 1668 treatise on language, the *Discours physique de la parole* (which he dedicated to Louis XIV). Children came into the world, he wrote, equipped solely with

> what nature gives to all humanity in order to express pain, joy, or the other passions, but that is sufficient. If they live, they are able to study their nanny's face so well that she can make them cry or laugh simply by looking at them.

[94]Cordemoy was another friend of Bossuet and from 1673 a '*lecteur ordinaire*' to the Dauphin; he was elected to the Académie française in 1675. He was an esteemed member of the Cartesian circles fashionable in Paris in the 1660s, around Mme de Bonnevaux, Henry Louis Habert de Montmort, Jacques Rohault, Guillaume de Lamoignon, the abbé Bourdelot, and Lefèvre d'Ormesson. For a full account of Cordemoy's life, see the 'Introduction' to Gérauld de Cordemoy, *Oeuvres philosophiques, avec une étude bio-bibliographique* (Paris 1968), Pierre Clair and François Girbal (eds).

> Thus, they easily get to know the passions of those who have contact with them, through the external movements which are their natural signs.[95]

Emotions, here again, were a form of cognition, and a form of judgement, evaluation or thought. But, he went on to say, children 'take a bit longer to decipher the signs that men have instituted to signify things'.[96] And signs, here again, were not natural: they were a code, instituted by humans for the communication of information and therefore had to be learned. It was precisely such a code that the deaf, according to the Royal Society group discussed earlier, were able to learn, though how it was that it could be acquired at all, even without the early exposure of 'soft brains' described by Fénelon, was not easy to explain. Indeed, in so far as learning a language amounted to acquiring knowledge of an arbitrary set of grammatical rules, it was not clear how language came to signify at all; nor was it clear how, if these rules really were instituted by man, a word could come to mean anything true about the real world and designate real objects. It seemed that, just as naming an object must go hand in hand with identifying its function – or its essence – so it was via the processing of sense-data that we could have any acquaintance with the world. Inversely, it could also be, as Locke would write (in relation to Molyneux's question), that we could only consciously recognize objects we perceived by having an idea of them in our minds which had been acquired through our senses.[97] We shall shortly see how, in Cordemoy's dualist scheme, using language was, in a rather convoluted way, akin to perceiving. As would be the case for Locke, it involved the conceptualization of data; and the relation between word and thing was equivalent to that between idea and thing: to speak, he said, was '*donner des signes de sa pensée*'.[98] For both Cordemoy and Locke, language was unquestionably a coherent system because, quite simply, it supposed and was built upon a constant correspondence between referent, sign and meaning.

Unlike Locke, however, Cordemoy had the intention of establishing that belief in the existence of such a correspondence entailed a commitment to dualism: by showing the first, one inevitably proved that the other was true. He followed Descartes in adopting a 'nativist' picture of the nature of thought and assumed, as in fact Locke also did, that mental discourse preceded verbal discourse, that thoughts preceded words, while words expressed thought. Cordemoy did not need a Lockean doctrine of ideas, however, and was content with the notion that, as Aristotle had put it: 'The things of the voice are symbols of the things of the mind, and the things of writing are symbols of the things of the voice.'[99] But Aristotle's subsequent

[95]Cordemoy, *Discours physique de la parole,* in *Oeuvres*, p. 213.
[96]Ibid., p. 207 (Preface). See also p. 21.
[97]Locke, *Essay*, II, ix, 1–10. See also I, ii–iv.
[98]Cordemoy, *Discours physique de la parole,* in *Oeuvres*, p. 206 ('Preface').

claim that 'the states of mind ... to which these signs refer are the same for everyone, as are the reflections of things which are the same for everyone' was exactly what a Cartesian rationalist might want to doubt hypothetically. And so, since language was the means through which one could 'know others, and be known by them',[100] studying how language functioned was, for Cordemoy, necessary to understanding the nature of communication. He thus began by asking how one could be sure that the language system worked and that the meaning attached to words by the listener or reader was identical to the meaning intended by the speaker or writer. His concern, announced at the beginning of the preface to the *Discours*, was in particular to show why, since the system did work – showing how it worked was not his intention – dualism was true. Speech must surely be the sign of the necessity that all bodies which were similar to mine were united to souls similar to mine, because it was both 'of the Soul' and 'of the Body'.[101]

The problem of knowing 'other minds' was here posited as a hypothetical one. Cordemoy used it to undermine its own foundations as a problem, just as Dalgarno and his colleagues were able to eliminate the need to posit it by presenting their project in a positivistic fashion. So, Cordemoy started off his argument by assuming that physical expression alone could not be *meaningful* if not accompanied by parallel movements in the brain. He supposed at first that there were no grounds for him to believe that other people were like himself, that they thought and had a soul like his own.[102] The parrot analogy made an appearance, as it did in Holder[103] and in Locke,[104] to help make the point that while non-rational creatures such as parrots could emit intelligible, seemingly intelligent sounds – just as mechanical contrivances were capable of doing[105] – they were themselves unable to generate unconditioned linguistic constructs. Words, as Descartes himself had pointed out, were related to passions only in humans.[106] The words of parrots were devoid of content. The sounds they made certainly did not signal the existence of a thinking mind and could just as well be

[99]Aristotle, *De interpretatione*, 16a3. Cited in K. O. Apel, 'The Transcendental Conception of Language: Communication and the Idea of a First Philosophy', in H. Parret (ed.), *History of Linguistic Thought and Contemporary Linguistics* (Berlin and New York 1976), p. 36. Bacon cited the same Aristotelian passage for this fairly straightforward notion. Cordemoy does not seem to have been referring explicitly to Aristotle but the analogy is evident enough.
[100]Cordemoy, *Discours*, in *Œuvres*, p. 193 (dedication 'Au Roy').
[101]Ibid., p. 196.
[102]Cordemoy, *Discours*, p. 196. See also pp. 206–9.
[103]See the quotation from Holder's *Elements* above, p. 8.
[104]Locke, *Essay*, III.i.1–2. For an analysis of ancient conceptions of animal communication, see D. K. Glidden, 'Parrots, Pyrrhonists and Native Speakers', in S. Everson (ed.), *Companions to Ancient Thought,* 3*: Language* (Cambridge 1994), pp. 129–48. See also Elisabeth de Fontenay, *Le silence des bêtes. La philosophie à l'épreuve de l'animalité* (Paris 1998).
[105]Cordemoy, *Discours*, in *Œuvres*, p. 206.
[106]See Descartes, letter 'Au Marquis de Newcastle', 23 November 1646 in Descartes, *Œuvres*, Alquié (ed.), p. 694.

echoes resounding off rocks. It was the mind, not the disposition of organs, that determined the capacity to speak. Neither parrots nor the other beings observed by the sceptic spoke meaningfully, whereas the creator of this thought-experiment clearly did.[107] In other words, one could not take for granted the correspondence between external appearance and internal nature.[108] But Cordemoy, the observer, noted that since people's external gestures and words – the signs of objects of thought – seemed to relate to his own objects of thought, since he seemed to interpret these signs of intentions and perceptions in a coherent, accurate fashion, then language, expressed through these conventional signs learned in infancy, must be accompanied by movements in the brain.

Language thus consisted both of sounds – mechanically transmitted, in man as in beast, through the air into the ear and from there, via the nerves, into the brain[109] – and of referents, perceived and understood by the mind. It was for this reason that, for Cordemoy, we must be composed of two separate substances, an extended one and a thinking one: 'nothing is less like our thoughts than that which enables us to explain them'.[110] As with Descartes, this difference between word and thought, physical sound and silent mental event, manifested at once the difference 'between our body and our soul' and 'the secret of their union'.[111] It was because we understood other people's facial expressions, and because the communication of their thoughts to us provoked thoughts in our own mind, that these facial expressions corresponded to real states of mind,[112] these words to real thoughts, and that gestures and words were the manifestation of the union of body and soul. Since words could only signify anything if they corresponded to mental events or movements in the brain – and thoughts were themselves mental events – meaningful signs must be the translation of thoughts, the perception of which triggered in us similar movements in the brain that we freely willed to follow or not.[113] Our minds were not determined by our bodies; but since we were dual creatures, physical events and mental events were bound to one another. We could speak unprompted, or we could choose to remain silent; and this freedom of our will was a function of mind–body duality.

[107] *Discours*, in *Œuvres*, p.196 ('Preface').
[108] Ibid., p. 206.
[109] Ibid., pp. 223–33. According to Cordemoy, the acoustic processes which allowed animals to hear each other were identical to those in humans insofar as speech was also a purely physical activity which did not on its own, or a priori, entail a soul.
[110] Ibid., p. 209. Cordemoy posits an equivalence between the relation of word to thought and that of animal, machine or rock to man: see Philippe-Joseph Salazar, *Le culte de la voix au XVII*$^{ème}$ *siècle: Formes esthétiques de la parole à l'âge de l'imprimé* (Paris 1995), p. 73; on Cordemoy, pp. 71–7.
[111] Ibid., p. 210.
[112] Ibid., p. 208.
[113] Ibid., p. 233.

As a response to the 'other minds' enigma, the argument made a circular loop.[114] But its real point resided in the logical twists Cordemoy somewhat earnestly gave to this loop. The first twist was the use of the fear of mental solipsism to establish mutual legibility as the foundation-stone for a dualist metaphysics: it was the very opacity of communication, coupled with the undeniable fact of its existence, that demonstrated our dual nature, where the duality was such that 'an agitation [*ébranlement*], being a movement, can only belong to our body, and perception, being a thought, can only belong to our soul'.[115] The second twist, which followed from the first one, consisted in the affirmation that the existence of language *proved* that one could plausibly *derive* the existence of mental events from the observation of physical ones. This was precisely what Cordemoy thought he might have reason to doubt in the first place; and no empirical proof was available other than the fact, self-evident to him, that for a machine to speak and gesture as we do would be quite impossible. It was this very incapacity of a machine to express itself as humans did, to fool the observer (its inability, one might say, to pass the Turing test),[116] that showed how the necessity of using signs to communicate our thoughts derived from the divinely managed mind–body relationship.[117] According to Cordemoy's extreme dualist position, our bodies were the producers of a language whose syntax was scripted by our minds and whose narrative was made up of the referents of thought; the whole was magisterially directed by God. What Cordemoy assumed, it appears, was that our thoughts were simply mental, in the sense that perception, rather than being locked in a causal relationship with them, was merely the corporeal occasion of their formation. To him, this meant that our bodies, *on account of* which movements and signs were necessary for the communication of our minds' contents, were themselves impediments to communication. The movements of our brains were entirely unlike the thoughts that they accompanied. So, on the atomist notion that like was drawn to like, there was no good reason, other than the existence of the body, for thoughts to *need* these movements, since they would rather have the company of other thoughts.[118]

[114]See Noam Chomsky's suggestive talk, published, along with the ensuing discussion, as *Language and Thought* (Wakefield and London 1993), p. 37, in which he briefly refers to this test, devised by Cordemoy (and other Cartesians, as well as Descartes himself) for 'determining whether another object has a mind like ours', as 'normal, garden variety science, like developing a litmus test for acidity: the task is to determine whether one of the real components of the world is present in a certain case – acidity, or a mind'.

[115]Cordemoy, *Discours*, in *Œuvres*, pp. 233–4.

[116]Chomsky, *Language and Thought*, pp. 37–40, also points to the possibility of comparing the 'Cartesian tests for the existence of other minds with the current reliance on the 1950 "Turing test" to determine "empirically" whether a machine can carry out some intelligent act (say, play chess)'. But he then speaks of a 'conceptual regression since the cognitive revolution of the 17th century' and argues that one should not submit the study of the mind to a rigidly defined field and set of methods.

[117]Cordemoy, *Discours*, in *Œuvres*, p. 210.

It was thus possible to posit that we might exist without our body: its ontology was not dependent on any metaphysical requirements. Indeed, as pure minds we would be at leisure, if we so desired, to communicate with other minds embodied or not – and rather better than we did as embodied creatures – just as it was possible for minds still united with bodies to communicate, voicelessly, with disembodied minds.[119] Signs were only necessary because we existed as embodied creatures; they were approximate translations of thoughts. Words were not necessary for communication other than as imperfect remedies to the rocky marriage of mind to body, the smooth running of which was overseen by God. The notion that mind-events and physical events kept each other constant company, in a 'necessary correspondence',[120] was one way of explaining how we could function as a unit while having a dual nature;[121] but it was God that ensured the unit's harmony. Descartes had located the soul in the pineal gland, assigning to it a physical place inside the very body from which he had first expelled it. Cordemoy, by contrast, left the need for a physically plausible theory entirely out of the problem of mind–body interaction, which he preferred to consider resolvable by appeal to a version of what was eventually named 'occasionalism'. This was a solution that Nicolas Malebranche (1638–1715) would later develop, according to which the apparent interaction of mind and body was in fact the manifestation of a concurrence of events caused by God, rather than by the causal interdependence of mind and body that one instinctively interpreted it to be.[122]

It appears that language, for Cordemoy, rather than simply manifesting mental activity, stood as a reminder of our embodied nature; and it is perhaps ironic that in writing a treatise on language he ended up demonstrating the theoretical possibility of extra-sensory perception – one section is entitled: '*Que l'ame séparée du corps, pourroit plus aisément communiquer ses pensées à une autre'*.[123] What matters to us here, however, is that, within this system, only the existence of the physical and biological processes of perception would have warranted an analysis of the relation of linguistic structure to thought.[124] Cordemoy included in his treatise – and

[118]Ibid., p. 249.
[119]Ibid., pp. 250–3. See also the 'Preface', p. 199.
[120]Ibid., p. 238.
[121]For an insightful analysis of the place of Cordemoy's thought on language in his metaphysics, see the essay by Balz, *Cartesian Studies*, pp. 3–27: 'Geraud de Cordemoy 1600–1684'.
[122]Cordemoy developed the notion that we might be mistaking occasion for cause in his *Six Discours sur La distinction & l'union du corps & de l'ame*, first published in 1666.
[123]Cordemoy, *Discours*, in *Œuvres*, p. 29. See also Hans Aarsleff, 'Descartes and Augustine on Genesis, language, and the angels', in Marcelo Dascal and Elhanan Yakira, (eds), *Leibniz and Adam* (Tel Aviv 1993), pp. 169–95, at p. 175.
[124]Aristotle, in *De anima*, II, 8, 420b, describes the human voice as an animal sound produced by the impact of air on the trachea along with an image. See Salazar, *Culte de la voix*, p. 31.

there was nothing exceptional in doing so – a number of pages on the anatomy of the ear and the mechanics and ethology of speech, hearing, pronunciation, grammar, on the acquisition of language and on learning foreign languages. There was also a substantial section on the art of rhetoric, informed by traditional *loci* on the passions, perhaps present, in part, on account of his professional activities as a lawyer, but explicitly because, as he wrote, the need for eloquence derived from 'the indispensable necessity we are in during our lifetime to express ourselves through spoken words',[125] and to make the very best of our imperfect tools of communication. Mainly, though, these sections illustrated a finalist belief that our bodies functioned as a result of God's design, and the faculties with which we, along with animals, were equipped, were proof of its perfection. Animals heard sounds that entered their ears and travelled via the nerves to their brain, whose disturbance caused spirits to flow to their legs and induce action. This happened because of a

> necessary order in the mechanical arrangement of the entire body of each kind of animal, and even of every individual beast, which, as it belongs to one species, and so was formed for a particular purpose, possesses all that is required to execute what the Author of nature has intended it to perform in shaping it. Its brain is so well adjusted, according to its temperament, to everything that can help it survive that objects which can harm it will disturb its brain in such a way that it will always open up at those very places from which the spirits can flow into the muscles used to draw back from these objects.[126]

And inversely: the impact of useful objects on the brain provoked it to let spirits flow into the muscles that would enable the animal to approach these objects. Mechanical adaptation to nature was a product of God's work.[127] No aspect of nature's elaborate engineering, it seemed, should really surprise the dualist, since the realm of matter obeyed the laws of physics, by means of which all physical behaviour could be understood. Mental events were a separate issue. In other words, on this picture, there was no mind–body problem.

What we started off with, then, no longer seems so straightforward: the view that language was the manifestation of higher mental life actually served to throw light on its boundaries, on its origins in our existence in nature as embodied creatures, whose minds must be connected, at most for the duration of terrestrial life, to bodies. The notion of language as partial and limited was equivalent to that of language as reflecting, and resulting from, our fallen and imperfect nature. But here there was no quest for a

[125]Cordemoy, *Discours*, in *Œuvres*, p. 241: *Les causes physiques de l'Eloquence*.
[126]Cordemoy, *Discours*, in *Œuvres*, pp. 223–4.
[127]Ibid., p. 224.

universal language, for the reestablishment of universality and transparency on earth. The very possibility of unity between sign and object was indeed of no relevance to understanding the physical world and our place within it. Cordemoy's starting-point had been instead to identify the difference between sign and signifier as a difference of substance – just as Descartes had done with the mind and the body – and likewise for the difference between the sound or letters of a word and the object denoted by that word. He further assumed, as Hobbes had also done, that one could not attribute to products of the mind what belonged to physical objects. This might amount to the fallacy of assimilating predication to efficient cause; but it is of more interest and higher import to note that Descartes himself had made a similar point at the beginning of *Le monde ou Traité de la lumière*,[128] the first chapter of which is entitled '*De la différence qui est entre nos sentiments et les choses qui les produisent'*.

There, Descartes had insisted that there need be no identity between an object and its sign, the object in this case being light, 'that is, what it is in a flame or in the sun that we call Light'.[129] Crucially, his goal in pointing this out was not solely the methodological one of establishing viable grounds for doubting the reliability of perceptual experience in yielding the true nature of objects of sense;[130] nor was it at all to devise a positive theory of meaning.[131] His aim was to establish a proper realm for physics, one in which sensible qualities were the mark of subjective experience, and did not reside, as Aristotelians would have it, in the physical objects themselves. Positive description of light according to mechanical explanation resulted from the need, born of scepticism, to test how error-proof sense-experience could be. The trial was set up by assembling the conditions for an ultimately circular 'litmus-test', whose purpose was to reconstruct not the episteme or the observer's gaze but rather the world; it was later repeated by Cordemoy with a vengeance. The banal notion of the arbitrariness of reference was here enriched by the purpose to which Descartes put it. The trick was the identification of percepts with signs, and the description of the experience of percepts as resulting in sensation, 'sentiment': nature, Descartes wrote, has arranged for the sign that produces the 'sentiment' of light to signify light, just as it has established 'laughter and tears, to let us read joy and sadness on people's faces', and just as humans have instituted the meaning of words.[132]

[128]First published posthumously in Paris in 1664, but written as a companion treatise to *L'Homme*, which itself was first published at Leiden in 1662, in a Latin translation, and, again by Clerselier, in Paris, in the original French in 1664.

[129]Descartes, *Le monde ou Traité de la lumière*, in *Oeuvres*, Alquié (ed.), I, p. 319.

[130]Ibid., p. 315.

[131]Hacking, in *Why does Language*, p. 23, shows how Hobbes, despite having a definite notion of language, '*did not have a theory of meaning*' (Hacking's italics). Precisely because thought and language were not construed as interdependent, the concept of meaning was not supervenient on the analysis of the linguistic function. See also Chomsky, *Language*, pp. 22 and 59 (the observation by Eric Wanner).

The signs were meaningful because our minds, which 'retain the meaning of these words and expressions, represent it to us' while we hear or see them.[133]

If, he continued, as the philosophers (that is, the scholastics) say, 'sound is nothing but a vibration of the air that hits our ears', the image of the object of hearing that should be brought to our minds is the vibrating air itself.[134] Since this was not the case, our experience of sensation was not identical with the encounter with the objects which caused it: we perceived effects, not causes. Sensible qualities told us nothing about the true fabric of the world, because sense-experience did not give us direct access to this fabric. Just as a child who was being stroked by a feather as he was falling asleep would not identify the tickle with its cause,[135] so the sensation of light did not reside in the objects from which it seemed to arise. In a sense, we lived in the dark until we realized this, and until we began to investigate what that fabric was really made of. This tight argumentation can be contrasted with a statement by Robert Hooke (1635–1703), typical of the optimistic and forcefully empirical ethos of the Royal Society, that

> the best and utmost we can do towards the discovery of them [Causes, Principles, and Operations ... far removed from the reach of our Senses], is only accurately to observe and examine all those Effects produced by them, which fall within the Power of our Senses, and comparing them with like Effects produced by Causes that fall within reach of our Senses ... and so from Sensibles to argue the Similitude of the nature of Causes that are wholly insensible.[136]

The dualist stance established the necessity of dividing the set of objects to be studied into two realms, shading the illuminated realm of physics and physiology with the other, mysterious, immaterial one. Language, in this context, was a product of both realms. Descartes, by packing all perception into the semiological realm, assimilated words to sensations, to the experience of the touch of a feather. If it were not for the fact that language was – as we saw at the beginning of this article – a system which we could use freely, unprompted, creatively, then words would be whistles, akin to echoes, merely vibrations of the air. But they were not. What, then, were whistles? Animals emitted sounds, and they behaved as though they too had sensations. At stake in the preservation of the Cartesian wedge between sensation and higher cognition was the place of self-conscious beings such as

[132]Descartes, *Le monde*, in *Œuvres,* Alquié (ed.), p. 316.
[133]Ibid., pp. 316–17.
[134]Ibid., p. 317.
[135]Ibid., p. 318.
[136]Robert Hooke, *Posthumous Works*, Richard Waller (ed.) (London 1705), p. 165. Quoted by John Henry, 'Robert Hooke', in Michael Hunter and Simon Schaffer (eds), *Robert Hooke: New Studies*, pp. 149–80, at p. 163. See also the Preface to Hooke's *Micrographia* (London 1665; reprinted New York 1961), a1r.

ourselves in the natural world. It is not one we have yet fully understood. But Descartes was the first to simplify it, by corralling animals away from the sight and emotional investment of human affairs.

This division was one consequence, as well as one aspect of the new philosophies of nature, which triggered a good deal of puzzlement about the function of a rational faculty in creatures such as ourselves, whose bodies functioned like those of animals, according to the laws of nature – of matter in motion, mechanical action and blood circulation – but whose souls had to remain immortal. The efforts to map the human mind's hidden contents in terms of our capacity for symbolic representation are one manifestation of this perplexity about reason. The creation of a language for the deaf-mute and the quest for a universal language were related to the establishment of criteria for the practice of natural philosophy, as well as to debates on ideas and thought in French Cartesian circles. Questions regarding the nature of language and its acquisition could not be set apart from those regarding the nature of thought; but neither could questions about the nature of reason be formulated without language. This puzzle about the place of language in the natural world is reflected today in our concern with the nature of animal language and consciousness, and in the application of evolutionary theory to the study of language. Our assumptions about the language of thought and our methods of study have changed; but the explanatory gap remains. This is why the history of natural philosophy can contribute to a genealogical appraisal of the modern philosophical canon and thereby help confer a sceptical humanist's perspective on the questions surrounding the new mind sciences.[137]

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