

# Critical Survey

Editors: Bryan Loughrey and Graham Holderness

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*Critical Survey* addresses central issues of critical practice and literary theory in a language that is clear, concise, and accessible, with a primary focus on Renaissance and Modern writing and culture. The journal combines criticism with creative writing, including poetry, providing an essential resource for everyone involved in the field of literary studies.

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# At the Root of Learned Travel

## New Science, the ‘Other’ and Imperialism in the Early *Philosophical Transactions*

Manuela D’Amore

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### Abstract

Starting from the sixteenth- and early seventeenth-century *ars apodemica* tradition, this article is based on Henry Oldenburg’s determination to include ‘inquiries’ on – and descriptions of – distant countries in *Philosophical Transactions*. Its four subsections all refer to the late Restoration period: they describe the tools of learned travel in the age of New Science, and focus on the Royal Society’s correspondence from the East and from early America. The short extracts taken from vols. 1–22 of *Philosophical Transactions* are also meant to show the Society’s imperialistic vision of the ‘Other’ and of the indigenous ‘know-how’ in most fields.

**Keywords:** late Stuart era, learned travel, New Science, Newfoundland, *Philosophical Transactions*, the Far East, the Middle East, the Royal Society

It was 1 January 1665 when *Philosophical Transactions* of the Royal Society first appeared. Henry Oldenburg (c. 1618–1677), its founder and editor, pursued the Society’s end to promote experimental knowledge, and created a network of far-flung correspondents – men of science, men of letters and of the church – to diffuse scientific findings all over the world. The reading and discussion of their letters at regular meetings constituted a significant contribution to the intellectual and social vitality of late Stuart England.

Scholars’ use of letter exchange as an indispensable tool to collaborate in the field of natural philosophy had been established in Europe by 1650. An expert in historical and contemporary studies in writing, Charles Bazerman confirms that, following the newly founded *Journal des sçavans* in France,<sup>1</sup> *Philosophical Transactions* grew out of the Fellows of the Royal Society’s correspondence, and that Henry



Oldenburg wanted to enhance it through his personal relations with Samuel Hartlib (c. 1600–1672), Menasseh Ben Israel (1604–1657), John Milton (1608–1674) and Robert Boyle (1627–1691).<sup>2</sup> As a result, in 1665, immediately before the Great Plague, the Royal Society became one of the leading scientific institutions in early modern times, benefiting from 104 active Fellows, a wide network of foreign virtuosi as well as the ability of its principal officers to use both research and epistolary materials effectively.<sup>3</sup>

The earliest issues appeared in the form of a summary of Henry Oldenburg's correspondence with the Fellows of the Society. Soon, however, he started to quote at length from them, and the articles appeared directly in the form of letters to the Society. As Bazerman posits, though, it took more than a century for published materials to adopt the abstract argumentative tone and focus of scientific articles.<sup>4</sup>

Natural philosophy was not the only issue in the prestigious journal. There was also space for the humanities, archaeology in particular, and for 'some Philosophical and Curious Books',<sup>5</sup> but travel accounts were given special attention. In fact, England's international prestige as a maritime power had to be enhanced, but it was necessary to go back to the glories of Renaissance times to promote change.

Jerome Turler (1550–1602), Thomas Palmer (1540–1626), Robert Dallington (1561–1637), Robert Devereux (1566–1601), Edward Leigh (1602–1671) and Thomas Neale (1614–1646) were only some of the key authors of the past *ars apodemica* tradition; it was virtually impossible to ignore that they had both given 'profitable instructions' for sea voyagers<sup>6</sup> and urged them to base their visits abroad on 'observation',<sup>7</sup> 'a method'<sup>8</sup> and the 'ripening of knowledge'.<sup>9</sup> The moral purpose of their writings, however, was too strong, and, on the eve of the Enlightenment, that peculiar aspect needed to be balanced.

Proof of the central position of religion in early manuals for sea voyagers, and of the necessity for natural philosophers to change direction, could be found in Thomas Palmer's *An Essay of the Meanes Howv to Make Our Trauailles, into Forraine Countries, the More Profitable and Honourable* (1606). For him, 'regular trauailing' was 'an honorable or honest action' and 'the maintenance and exercise of true religion and Godliness' were the most 'preferable things in the world';<sup>10</sup> more than ten years later, Bishop Joseph Hall (1574–1656), the author of *Quo vadis? A Ivst Censvre of Travell as it is Commonly Vndertaken by the Gentlemen of our Nation...* (1617), thundered that it was 'the Trauell of Curiosity' that he quarrelled with, as it was morally unacceptable.<sup>11</sup>

Direct observation and knowledge slowly gained importance, and James Howell's *Instructions and Directions for Forren Travell...* (1650) became one of the tracts that paved the way for the more scientific travel writings in late Stuart years. The underlying idea was that the perfect traveller had 'bin first an Vniversity Man', and that he understood 'the use of the Map and Globe, to find out the Longitude and Latitude of all places'; religion, however, had still a central position, and history, literature, drama, as well as 'a passable understanding of the *Latine* toung', were indispensable to benefit from travel.<sup>12</sup>

The application of the Galilean method to most branches of learning gave new foundations to travel in the 1660s. For Judy Hayden, the author of *Travel Narratives, the New Science, and the Literary Discourse, 1569–1750*, it was Bacon's *The Aduancement of Learning* (1605), and his appeal to build on the recent 'Proficiencie in Nauigation and discoueries', that persuaded Oldenburg to include 'inquiries' on – and descriptions of – distant countries in *Philosophical Transactions*.<sup>13</sup> Perspectives immediately changed, and the scientific observation of the 'Other' in distant worlds obliged travellers to use a more advanced technology, pay closer attention to cross-cultural issues, as well as to reflect more seriously on political life, ethnography and the natural world. Of course, progressing in the field of sea and ocean studies – thus utilizing the latest acquisitions in mathematics, geometry and astronomy – was the key to break with the past and impose new cultural models.

### **On 'Arithmetically Navigation': New Directions, Tools and Maps for Learned Seamen**

The Royal Society played a crucial role in this field. Its Fellows showed that knowledge about foreign lands and populations was still uncharted, and that scientific research was inextricably linked with the travelling experience.<sup>14</sup> As a result, there was strong cross-fertilization between science and the arts, and higher educational standards were set.

The principle that the 'Art of Navigation' was 'one of the most useful in the world', and that there were still 'many things to be known and done',<sup>15</sup> underlay the first issues of *Philosophical Transactions*. In fact, although early in 1625 Thomas Addison (fl. 1625) had published a volume called *Arithmetically Navigation: or, An Order thereof: Compiled and Published for the Aduancement of Navigation...*,<sup>16</sup> illustrations and detailed 'catalogues of directions' for seamen completed most articles in the Society's journal, and 'Eminent Mathematicians' urged future

travellers 'to observe the Declination of the *Compass*', 'remark carefully the Ebbings and Flowings of the Sea' and 'keep a Register of all changes of Wind and Weather at all houres, by night and by day'.<sup>17</sup>

Evidence that the Fellows of the Royal Society had a deep interest both in navigation and in the advancement of sea and ocean studies could be found in the article written by first-class scientist Robert Boyle, and published in *Philosophical Transactions* in 1666. 'Other Inquiries Concerning the Sea' was centred on the necessity of acquiring information about 'the Odors, Colours and Tasts' of 'Sea-water', as well as the difference between its 'Bottom' and 'the Surface of the Earth',<sup>18</sup> yet precise answers to most scientific queries could be given several years later, in 1693, when his research on the 'Freshness and Saltness' of sea water was completed, and given high resonance in volume 17 of the journal.<sup>19</sup>

Robert Boyle was not the only natural philosopher who used the 'experimental and mathematical way of enquiring into nature',<sup>20</sup> and who thus contributed to the making and charting of water spaces. Sixteenth- and early seventeenth-century publications like *The Rutter of the Sea* (1520), *The Safeguard of Sailers* (1584) or *The Light of Navigation* (1612)<sup>21</sup> were by French and Dutch authors – Pierre Garcie (c. 1435–c. 1520), Cornelis Antoniszoon (b. c. 1499) and Willem Jansz Blaeu (1571–1638) – who wanted to share their theoretical and practical acquisitions with their contemporaries;<sup>22</sup> however, the letters published in *Philosophical Transactions* in the late Stuart period were different. Based on experiments aimed at grounding possible hypotheses and theories,<sup>23</sup> they equally supported the nation's scientific progress and expansion needs abroad.

It was for this reason that the sophisticated observation instruments that mariners could use in dangerous sea travels were listed in long appendices at the end of the earliest issues of the Royal Society's journal. There was a 'Globe of Firr, or Maple',<sup>24</sup> a 'pendulum watch',<sup>25</sup> Newton's 'new telescope',<sup>26</sup> Leibniz's 'portable watch'<sup>27</sup> and Halley's 'Magnetical Compass'.<sup>28</sup> They were all carefully represented, or described for educated and 'Industrious' readers, and were connected with 1684 'Directions for the use of tide Tables'.<sup>29</sup>

Charting and mapping seas, oceans and far distant countries became *the* issue. Again, Renaissance England had established a tradition in the field, but the adoption of the Ptolemaic system made Richard Arnold's *Mappa Mundi* (1550), Thomas Blundeville's *A Briefe Description of Vniuersal Mappes and Cardes* (1589) and William Camden's

*Angliae et Hiberniae Nova Descriptio...* (1592)<sup>30</sup> rather old-fashioned and incomplete works that could only be seen as ‘abstract accumulations of data on local aspects’ retaining only ‘temporary rather than permanent features’.<sup>31</sup>

The Royal Society’s correspondents went beyond individual experience and hypotheses to attain certainties and final truths: they could rely on the principles of New Science, but generally continued to include narratives and detailed explanations in their geo-cartographical representations. ‘An Advertisement of a way of making more lively Counterfaits of Nature in Wax’, together with ‘a new kinde of Maps in a low relievo by the Ingenious Mr. John Evelyn’, appeared in volume 1 of *Philosophical Transactions*:

I have also seen a new kinde of *Maps* in a low *Relievo*, or Sculpture: For example, the Isle of *Antibe*, upon a square of about eight foot, made of boards, with a Frame like a Picture: There is represented the Sea, with ships and other Vessels Artificially made ... after a new and most admirable manner. The Rocks about the Island exactly form’d, as they are upon the Natural Place ... in *fine*, Men [and] Beasts ... This new, delightful, and most instructive form of *Map*, or *Wooden Country*, you are to look upon either *Horizontally*, or *sidelong*, and it affords equally a very pleasant object.<sup>32</sup>

More news about maps was given in the following years. D.K. Smith in *The Cartographic Imagination in Early Modern England* has explained that, although cartography had been introduced to a widespread, literate public at the end of the sixteenth century, there was a significant change in surveying, measuring and recording from 1650 onwards.<sup>33</sup> In fact, in 1674, *Philosophical Transactions* published ‘a New Mapp of *Nova Zembla* and *Weigats*’, according to which ‘*Nova Zembla* [wa]s not an Island’ and ‘the *Mare glaciale* ... [was] a *Sinus* or Bay’;<sup>34</sup> in 1685, ‘the Learned Mr. John Greaves’ (1602–1652), professor of astronomy at Oxford, showed his ‘dissent from the traditions of the Antients’, Ptolemy in particular, and felt it necessary to ‘alter the Latitudes, if not the Longitude’ of Constantinople’.<sup>35</sup> Finally, in 1686, the ‘Large and Curious Map of Great Tartary’ was hailed as ‘the Discovery of a New World’, as ‘the Enterprise [was] so vast, and the success so unexpected’.<sup>36</sup>

Things were changing. From that moment, scholars laid the basis of the development of scale maps, of the bird’s-eye perspective, as well as of the rise of panoramic representations of cities and coasts. Space could thus be perceived more realistically, and travellers became instrumental in the new imperialistic plans of late Stuart England.

## Corresponding with the Fellows: Scientific Accounts and Early Travel Narratives

A more scientific, experimental approach to travel also implied a new vision of writing. Texts were expected to inform readers and be useful, so, especially at the beginning of the process, it seemed difficult to balance the use of scientific details, jargon and narrative forms.

‘Written by Mr. Joshua Childrey’, and ‘communicated by that Ingenious Travailor Mr. Richard Smithson Who made two voyages into those parts’, ‘An Accompt of a passage by Sea to the East-Indies’ appeared in *Philosophical Transactions* in 1669.<sup>37</sup> It was very far from a traditional piece of odeporic literature. It was the product of the latest research in the field of navigation, and it was based only on facts. The continuous references to the cardinal points, as well as to the latitude and longitude in the various phases of navigation, totally excluded information about the members of the crew and their experience aboard:

Near *Affrica* the *South-East*-winds hold to 28. or 29. Degr. *Southern Latitude*; but towards *Brasile* from the *Tropick* of *Capricorne* to 32 degrees they are variable, and to the Southward of 32. Westerly; as you may perceive by this following accompt.

*May* 29. Lat. 24.47'. Longit. (by the plain Sea-chart) from the *Lizard*, 11. Degr. West; Variation 10d 7' East: fair Weather; the Wind from SW to W. We sailed 50. miles.

*June* 1. Little wind, at SW.

*June* 2. Latit 26. o Calme all day, and a great Storm all night at South.

*June* 3. Strong wind at SSE. At 1. At night it came to E b S, and blew with the same violence till next day noon. At 6 in the Evening I saw *Mercury* very near the *Moon*, newly past Conjunction, as I supposed.<sup>38</sup>

It was clear that the author, Mr. Joshua Childrey (1623–1670), knew the winds, that he could use most of the sophisticated technology in the field of navigation and that his cultured readers would appreciate what may be defined as a purely scientific, informative text. Once again, though, it was hardly possible to compare that piece of writing with other similar works from the past. In the Renaissance period, for instance, Pietro Martire d'Anghiera's *The History of Trauayle in the VVest and East Indies...* (1577) had dedicated an entire section to ‘the fyrst discoverynge of the west Indies’;<sup>39</sup> Cornelius Geraldson's *An Addition to the Sea Iournal, or, Nauigation of the Hollanders vnto Iaua* (1598)<sup>40</sup> included a ‘Vocabvlar of certayne wordes vsed by the inhabitants of

the Island of S. Laurence';<sup>41</sup> and as for William Bruton's *Newes from the East-Indies* (1638),<sup>42</sup> it appeared immediately before the Civil War in the form of a modern journal including a detailed description of the 'Lawes, Manners, and Customes' in 'Bengalla'.<sup>43</sup>

Even though scientific accuracy and consistency was a priority, the Fellows of the Royal Society and their correspondents soon developed a new interest in the narrative side of travel accounts, as well as in cross-cultural issues. Published in *Philosophical Transactions* in 1686, for instance, 'A Voyage of the Emperor of China into the Eastern Tartary' referred to the Emperor's passion for European books,<sup>44</sup> for 'the Constellations that then appeared above the Horizon',<sup>45</sup> and the Great Wall; as for 'A Relation of a Voyage from Aleppo to Palmyra in Syria; sent by the Reverend Mr. William Halifax',<sup>46</sup> which appeared in 1695, it included a long introduction in Latin and was dense in information on the city of Tadmor, its heritage and 'Curiosities'.<sup>47</sup>

Going through those pages of *Philosophical Transactions*, the reader could see that there were no technicalities or any forms of jargon. Contents were generally divided into sections, but 'Voyage from Aleppo to Palmyra' in particular combined references to the exact measurement of the archaeological areas in the region with the peculiar 'mixture of Remains of the greatest State and Magnificence, together with the Extremity of Filth and Poverty'.<sup>48</sup>

It was not the first time that science blended with cross-cultural issues. Early in 1665, in volume 1 of *Philosophical Transactions*, the Fellows of the Royal Society had asked their correspondents queries about the Turks' use of 'Opium', about their skills in 'Poysoning', as well as their 'Arts and Trades';<sup>49</sup> in 1666, they had showed strong interest in 'the Kind of Learning' that the Persian population excelled in.<sup>50</sup>

Curiosity about the East could have originated from the volumes that circulated in the sixteenth and seventeenth centuries. Although *The History of the Warres betveene the Turkes and the Persians...* (1595), *Nevves from Turkie and Poland* (1622) and *The Life and Death of Nebuchadnezzar the Great...* (1665)<sup>51</sup> were mainly historical and biographical works, interdisciplinary links with cartography and geography were systematically created through the insertion of detailed maps and beautiful illustrations.

News from 'the Upper Egypt' was given by 'certain Missionaries' in 1670, and published in the Society's prestigious journal the following year. Clear reference was made to 'many Monasteries and ancient

Churches', but Turkey and the Middle East continued to be mentioned at the end of the article:

Our time being limited, we only could stay in *two places*; our design not being curiosity, but to satisfy the charge of the Mission among the Christian *Cophthes* of that Countrey, which are in great number there, and have many Monasteries and ancient Churches, but poor. We have passed many places, where was neither Priest nor Church, but only the poor people like Sheep without a Shepherd. I hope shortly to return thither, and not to come back again with so much hast, after I shall have made a little voyage up on the Red Sea, wither I go every year to visit the poor Slaves in the Gallies of the Turks, &c. *F. Brothais*.<sup>52</sup>

Science completely replaced religion in learned travel writing, yet theological disputes and cross-cultural implications continued to be two of the main issues for English educated voyagers for many years. In 1684, Rev. Thomas Smith (1638–1710), a Fellow of the Royal Society since 1677, told his readers 'what opinions the *Turks* [had] of our *B. Saviour* and of the *Christian Religion*',<sup>53</sup> and showed his interest in the other versions of the Alcoran in the Middle East. His long paragraph on the Persians' idea of Christ, though, was a metaphor for the Society's contradictory attitude towards other civilizations:

They confess that *Christ* was born of a pure spotless Virgin, the Virgin Mary, chosen by *God* and sanctified above all the women in the World. ... [Yet], they blaspheme indeed with a brutishness and stupidity only befitting *Turks*, the mysteries of the *holy Trinity*, and the divinity of our *B. Saviour*, and deny that he was put to death, and say that another in his shape was crucified by the *Jews*, and that he himself was assumed into Heaven in his body without dying at all, and consequently they will not own, that he satisfied divine justice for the sins of the World, so great an affinity is there between the heresy of *Socinus* and profess't *Mahometanism*.

## Confronting the 'Other': (Biased) Descriptions of Turkey, Japan and Newfoundland

On the eve of the Enlightenment, *Philosophical Transactions* continued to voice its correspondents' preconceived ideas about Middle Eastern populations. In the long 'Extract of the Journals of two Several Voyages of the English Merchants of the Factory of Aleppo, to Tadmor',<sup>54</sup> the Turks seemed to generate a strong feeling of danger because of their weapons, and the continuous risk of war that they represented. However, the reason it was difficult to accept the Eastern 'Other' could be found in their morals and manners. In the city of Soukney,

for instance, which was famous for its 'Hot Waters', men and women bathed in 'the same little dirty Hole' 'at different hours', which was their 'only mark of Modesty'.<sup>55</sup>

Curiosity about these countries led 'Ingenious' travellers to the Far East. Francis Caron's *A True Description of the Mighty Kingdoms of Japan and Siam...* had been translated from Dutch, and published in England in 1663.<sup>56</sup> Readers could probably enjoy one of the longest and most detailed analyses of Japanese civilization ever made, but a few years later, in 1669, *Philosophical Transactions* made the picture even clearer. In 'Some Observations Concerning Japan', in fact, racial issues were the starting point of the article:

10. The *Japanese* are proper enough of stature, and not uncomely in features; they have somewhat prominent bellys. They are exceeding active, and want no Judgement; they are also military and valiant.

11. No Arts are to be met with amongst them, that are not known in *Europe*, except that of making *Lacca*, of which there is some so fine and curious.

12. The Colours, with which they dye their stuffs, never fade.

13. They have Mathematicians amongst them, and believe in Iudiciary Astrology.

14. Japan yeilds divers sorts of good merchantable Commodities; but chiefly all sorts of silken Stuffs, unwrought Silk, Amber, Precious Stones, Musk, Copper Steel, Lack-work.

15. The Country is very well peopled and exceeding rich, being exceedingly stored with Gold-mines.

16. Their Buildings are very good and commodious.

18. They use the divertisements of Comedies, which are more brave than those of *Europe*.

19. Their Language is altogether different from the *Chinese* ... They write neither from the right to the left, nor from left to the right, but downeward.

20. Their Government is Despotique; the Religion Pagan ... Their morals are very good, their *faults* being punish't as their *Crimes*, even Lying and Detraction. Their left hand is the more honourable, as they take horse on that side.<sup>57</sup>

This information matched with Caron's conviction that 'women [were] ordinarily true and modest',<sup>58</sup> that 'every crime, how small soever, [was] punished with death'<sup>59</sup> and that 'when a Gentleman, or Soldier [was] condemned to die, he [was] allowed the honour to kill himself, by cutting up his belly with his own hands'.<sup>60</sup>

More travel accounts on Japan circulated in England until 1684, and most of them were by Jean-Baptiste Tavernier (1605–1689).<sup>61</sup> In 1674, however, Dirick Rembrantz van Nierop (1610–1682) contributed to *Philosophical Transactions* with ‘A Narrative of Some Observations made upon Several Voyages’ to celebrate ‘the Discovery of the famous Land of Jesso near Japan’.<sup>62</sup> ‘A Relation of Sailing through the North America to the East Indies’ was also included, and readers could find a biased description of the native population in Newfoundland:

The Natives are generally all short and thick, very hairy, their brows and lipps painted black or blew, their ears bored thorow, and with silver Ear-rings hanging in them. As for their Religion, they gave no other token of any, but that sitting by the Fire, and drinking, they spill thereabout some drops on several places, as if they offer’d to that Element before they would drink. They seem’d to be a kind of *Banditi*, masters all alike. The men have each two wives, of which they are very jealous. Both men and women love strong drink ... They are lazy, not tilling the ground, sustaining themselves by hunting, shooting, and fishing. They trade with *Japan*, and their language is mixed with the *Japonian*. They are very subtle in trading, but not thievish.<sup>63</sup>

England was literally flooded with accounts of American Indians in those years. An early American colonist, Daniel Denton (c. 1626–1703), whose *A Brief Description of New-York: Formerly Called New-Netherlands...* had appeared in 1670,<sup>64</sup> confirmed that the Natives lived ‘principally by Hunting, Fowling, and Fishing’, that ‘their Recreations [were] ... Foot-ball and Cards’ and that they were ‘great lovers of strong drink’;<sup>65</sup> on the eve of the Enlightenment, though, morals and religion gained importance, and Cotton Mather (1663–1728) used his *A Monitory, and Hortatory Letter to those English, Who Debauch the Indians, by Selling Strong Drink unto them...*<sup>66</sup> to stop the main forms of corruption in Newfoundland. Finally, Morgan Godwyn (fl. 1685) advocated ‘the necessity of *Instructing ... Negro’s and other Heathen in the Christian Faith*’,<sup>67</sup> thus showing Britons’ intention of both appropriating the land and depriving the local population of their traditions and religious faith.

The patronizing tones that characterized these authors’ writings were in perfect harmony with the approach that the members of the Royal Society had towards distant countries and their native populations. As has been said, they served the pre-imperialistic plans of late Stuart England, and meant to utilize science to show that the white man was naturally superior, and that he had the right to dominate the ‘savages’ in the New World.

Clear signs of racial discrimination could be first found in the ‘Observations’ that Martin Lister (1602–1670), a member of the English

parliament from 1640 to 1648, and a contributor to *Philosophical Transactions*, ‘made at the Barbado’s’ in 1675. Based on the conviction that ‘the blood of *Negro’s* is almost as black as their skin’,<sup>68</sup> issue 6 in his article was meant to start the scientific discourse on difference, and could be associated with Thomas Glover’s description of a ‘most prodigious Creature, much resembling a man’, whose head was ‘pyramidal, and slick without hair’. Glover’s narrative was centred on Virginia, and it was published in the Society’s journal in 1676:

About half a stones cast from me appeared a most prodigious Creature, much resembling a man, only somewhat larger, standing right up in the water with his head, neck, shoulders, breast, and waste, to the cubits of his arms, above water; his skin was tawny, much like that of an *Indian*; the figure of his head was pyramidal, and slick without hair; his eyes large and black, and so were his eye brows; his mouth very wide, with a broad, black streak on the upper lip, which turned upwards at each end like mustachoes; his countenance was grim and terrible; his neck, shoulders, breast and wast, were like unto the neck, arms, shoulders, breast and wast of a man; his hands, if he had any, were under water.<sup>69</sup>

Lister’s and Glover’s extracts echoed the accounts written by other European invaders in the Americas. Careful depictions of the alien faces and conduct that they saw, their articles reminded readers of ‘the archetypal human monstrosities’ who lived in unexplored countries,<sup>70</sup> and expressed strong pre-Adamic views. For Paracelsus (1493–1541) and Giordano Bruno (1548–1600), in fact, Native Americans were not descended from Adam, thus they were subhuman creatures without a soul; for Robert Boyle, ‘the Empire of Man over the inferior Creatures’<sup>71</sup> needed to be based on the association between natural philosophy and colonial conquest.<sup>72</sup>

If scientific learning had the same authority as the Bible, and colonial issues were continuously discussed by the Fellows of the Royal Society, the description of oddities and curiosities in distant countries attracted readers’ attention, but were not so central. The author of *The Genius of the English Nation: Travel Writing and National Identity in Early Modern England*, Anna Suranyi, argues, in fact, that English travellers’ interest in the ‘Other’ contributed to the construction of their national identity;<sup>73</sup> as regards the new trends of scholarship in this field, both text analysis and theoretical studies confirm that the Society’s intention of aiding their contemporaries in mastering those distant places explains why travel accounts were given such close attention.<sup>74</sup>

## The Savages' Skills for the Benefit of England: Natural Knowledge and Imperialism

It may be for this reason that in 1665, volume 1 of *Philosophical Transactions* also included a list of general 'Enquiries concerning Agriculture'. The Society's aim to prosecute 'the *Improvements of Natural knowledg*' was made clear in the introductory paragraph, and the reader's attention was immediately drawn to the work that was being carried out by the 'Members' of 'divers Committees':

Those Gentlemen, which do constitute the *Committee* for considering of *Agriculture*, and the *History* and *Improvement* thereof, have begun their work with drawing up certain Heads of *Enquiries*, to be distributed to persons *Experienced in Husbandry* all over *England*, *Scotland*, and *Ireland*, for the procuring a *faithful* and *solid* information of the *knowledg* and *practice* already obtained and used in these Kingdoms; whereby, besides the aid which by this means will be given to the general End of collecting the aforementioned *History*, every place will be advantaged by the helps, that are found in any, and occasion ministred to consider, what improvements may be further made in the whole matter. Now, to the End, that those *Enquiries* may be universally known, and those who are skillful in *Husbandry*, publickly invited to impart their knowledg herein, for the *common* benefit of their *Countrey*.<sup>75</sup>

Although specific reference was made to the necessity for Britons to share their expertise and technical competence for the '*common benefit of their Countrey*', the appeal that those '*Enquiries may be universally known*' showed that it was essential to diffuse information on distant countries.

Once again, travel was a precious resource. In 1666, Richard Norwood (1590–1676) wrote to the Society's Fellows from the Bermudas to show that men dug 'wells till they almost [came] to a Level with the superficies of the Sea, and [found] *fresh water or salt*';<sup>76</sup> in 1673, an unknown but 'Intelligent person residing in *Jamaica*' sent 'a box, that had in it a Cacao-tree painted to life': the picture contained both 'the whole *History of the Cacao*' and the '*Manner of Curing [it]*'.<sup>77</sup>

Learning new agricultural techniques, thus contributing to the scientific and economic growth of England, was extremely important in those years. One of Henry Oldenburg's correspondents, Samuel Hartlib, had written a dense volume entitled *The Compleat Husbandman: or, a Discourse of the Whole Art of Husbandry; both Forraign and Domestick* in 1659; in 1675, Joseph Blagrave's *New Additions to the Art of Husbandry...* advised readers who intended 'to undertake that profitable Labour and Improvement' how to enrich 'Barren, Molly, Spiry Meadows'.<sup>78</sup>

Of course, England had been rich in publications in this field since the Elizabethan era.<sup>79</sup> The news at the end of the seventeenth century was that New Scientists were open to foreign systems and know-how, and that detailed, reliable information depended on learned travellers' interactions with the local populations abroad. Evidence of the utilitarian attitude that they had towards the 'Other' could be found, for instance, in 'Observations Made upon several Voyages', where Dirik Rembrantz van Nierop suggested that newcomers 'should treat the Natives with all kindness ... and observe how they digg, &c.'<sup>80</sup>

It was clear that the Fellows of the Royal Society were no different from the authors of the many travel accounts circulating in England in those years. Scholarship in this field confirms that the natives' myriad languages and dialects caused serious communication problems at the beginning of the process,<sup>81</sup> but that close scientific observation helped to focus on relevant facts. In 1676, Thomas Glover, the 'Ingenious Chirurgion' mentioned earlier, gave the Fellows of the Royal Society further information about the Natives' 'manner of planting and ordering Tobacco';<sup>82</sup> the year after, John Winthrop (1637–1707), governor of the Colony of Connecticut from 1698 to 1707, wrote both on their 'Culture and Use of Maiz' and their making sugar "of the Juice of the Maple" in Canada'.<sup>83</sup> The following extract is taken from volume 15:

The Savages of *Canada*, in the time that the Sap rises, in the *Maple*, make an Incision in the Tree, by which it runs out; and after they have evaporated 8 pounds of liquor, there remains one pound as Sweet, and as much *Sugar*, as that which is got out of the canes ...

The Savages have practiced this Art, longer than any now living among them, can remember. There is made with this *Sugar*, a very good Syrup of Maiden Hair, and other Capillary Plants, which is used in *France*.<sup>84</sup>

Taking cues from Todorov, we may say that English learned travellers systematically connected 'difference' with 'inequality' when describing the 'Other',<sup>85</sup> but that, at the same time, they utilized their visits to overseas countries to increase England's scientific knowledge.

Of course, agriculture was not the only field they were interested in. 'Of the Way, Used in the Mogol's Dominions, to Make Saltpetre' appeared in *Philosophical Transactions* early in 1665, and readers could learn more about the way Eastern populations extracted and worked it.<sup>86</sup> A decade later, Mr. John Conyers' 'Observations Concerning Some of the Most Considerable Parts of Asia' included a long paragraph on 'the strongest glue in the world', as well as on the Persians' 'exquisit[e]' skill in 'damasking with vitriol'.<sup>87</sup> Finally, detailed information about less

known regions and other types of skills was given in 1677 in volume 12. The special technique, for instance, that men used to kill fowl on the remote island of Hirta, the largest in the archipelago near Scotland, was described as follows:

They go two and two with a long Rope, not made of Hemp, but of Cow Hides salted, and the Thongs cut round about, and plaited six or nine fold ... Each end of the Rope tyed about each one of their Middle, and that is foremost goes till he comes to a safe standing, the other standing firm all that time to keep him up, in case his foot should have slip'd: When the foremost come, either below or above him when his business is; and so they watch time about; seldom any of them being lost, when this is observed.<sup>88</sup>

Dr. Edward Smith (1665–1720), a Fellow of the Royal Society, published ‘An Account of a Strange Kind of Earth, Taken up near Smyrna, of Which is Made Soap’ at the end of the century, in 1695.<sup>89</sup> At that point, it was clear that, although *Philosophical Transactions* was made of science, technology and the arts, it was travel that created new stimuli and cultural trends, as well as a different conception of public communication. In fact, if the members of the scientific communities in Medieval times and in Renaissance England were firmly convinced of the positive value of ‘secrecy’, in the late Stuart age, learned institutions like the Royal Society changed directions, making knowledge public and sharing it with larger and larger social groups.

Of course, it was still possible to find evidence of the cognitive links between past and present: the idea of textual authority, typical of the Middle Ages, collided with empiricism; astrology and alchemy had their adherents among thinkers like Newton and Boyle; representations of monsters in the fifteenth and sixteenth centuries lingered well into the Restoration years. Travel helped Britons to go beyond the past and prepare for their future of international prestige. This was the starting point for one of the greatest socio-cultural phenomena of the Augustan age: the Grand Tour of the Old Continent.

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Cambridge Scholars in 2012. This article is a short version of Chapter 2 of her *The Royal Society and the Discovery of the Two Sicilies: Southern Routes in the Grand Tour* (Palgrave Macmillan), which is currently in press.

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## Notes

1. On the foundation and evolutionary phases of the *Journal des sçavans*, see William E. Burns, *The Scientific Revolution: An Encyclopedia* (Santa Barbara: ABC-CLIO, 2001), 156.
2. Detailed information on Henry Oldenburg, his contacts and the early *Philosophical Transactions* is in Charles Bazerman, 'Letters and the Social Grounding of Differentiated Genres', in *Letter Writing as a Social Practice*, ed. Barton David and Nigel Hall (Amsterdam: John Benjamins Publishing, 2000), 15–31.
3. See Michael Hunter, *The Royal Society and Its Fellows 1660–1700: The Morphology of an Early Scientific Institution* (Oxford: The Alden Press, 1994), 31, 119–121.
4. Bazerman, 'Letters and the Social Grounding of Different Genres', 24–28.
5. Here we quote from one of the titles of *Philosophical Transactions* (hereafter *Phil. Trans.*), 1665, 1: 145–146.
6. See Susan Lamb, *Bringing Travel Home to England: Tourism, Gender, and Imaginative Literature* (Cranbury: Associated University Presses, 2009), 21; and David McInnis, *Mind Travelling and Voyage in Early Modern England* (London: Palgrave Macmillan, 2012), 21.
7. Anonymous (Robert Devereux), *Profitable Instructions; Describing What Speciall Observations Are Taken by Trauellers in All Nations, States and Countries...* (London, 1633), 5.
8. Thomas Neale, *A Treatise of Direction, How To Travell Safely, and Profitably into Forraign Countries...* (London, 1664), 10.
9. Anonymous (Robert Dallington), *A Method for Trauell: Shewed by Taking the View of France...* (London, 1605), 4.
10. Anonymous (Thomas Palmer), *An Essay of the Meanes Hovv to Make Our Trauailles, into Forraine Countries, the More Profitable and Honourable* (London, 1606), 8–9.
11. Bishop Hall, *Quo vadis? A Ivst Censvre of Travell as it is Commonly Vndertaken by the Gentlemen of Our Nation...* (London, 1617), 5.
12. James Howell, *Instructions and Directions for Forren Travell...* (London, 1650), 9, 12.
13. Textual references to Bacon's work are in Judy A. Hayden, *Travel Narratives, the New Science, and Literary Discourse, 1569–1750* (Burlington: Ashgate, 2012), 7.
14. On the state of the art of geography and cartography in late Stuart England, see Hayden, *Travel Narratives*, 54–55.
15. *Phil. Trans.*, 1666, 2: 433.
16. Thomas Addison, *Arithmetically Navigation: or, An Order thereof: Compiled and Published for the Advancement of Navigation...* (London, 1625).
17. *Phil. Trans.*, 1665, 1: 141–142.
18. *Ibid.*, 315.
19. *Phil. Trans.*, 1693, 17: 627–641.
20. See Rose-Mary Sargent, 'Learning from Experience: Boyle's Construction of an Experimental Philosophy', in *Boyle Reconsidered*, ed. Michael Hunter (Cambridge: Cambridge University Press, 2009), 57–73, here 58.
21. Anonymous (Pierre Garcie), *The Rutter of the Sea with Hauens, Rodes, Soundings, Kennings, Windes, Floods, and Ebbes...* (London, 1520); Anonymous (Cornelis

- Antoniszoon), *The Safeguard of Sailers, or Great Rutter...* (London, 1584); and William Iohnson, *The Light of Navigation: Wherin Are Declared and Liuely Pourtrayed, All the Coasts and Hauens, of the West, North and East Seas...* (Amsterdam, 1612).
22. See David D. Waters, *English Navigational Books, Charts and Globes Printed Down to 1600* (Coimbra: UC Biblioteca Geral, 1985), 251; and John R. Short, *Making Space: Revisioning the World, 1475–1600* (Syracuse, NY: Syracuse University Press, 2004), 109–111.
  23. On the experimental method used by the Fellows of the Royal Society, see *Phil. Trans.*, 1666, 2: 565–567; 1668, 3: 652–655, 656–659; 1684, 14: 578; and 1686, 16: 220.
  24. *Phil. Trans.*, 1665, 1: 148–149.
  25. *Phil. Trans.*, 1669, 4: 45–56.
  26. *Phil. Trans.*, 1672, 7: 4032–4034.
  27. *Phil. Trans.*, 1675, 10: 272–279, 287.
  28. *Phil. Trans.*, 1683, 13: 208–221.
  29. *Phil. Trans.*, 1684, 14: 155–166.
  30. See Anonymous (Richard Arnold), *Mappa Mundi: Otherwise Called the Compasse and Cyrquet of the Worlde...* (London, 1550); Thomas Blundeville, *A Briefe Description of Vniversal Mappes and Cardes, and of their Use...* (London, 1589); and William Camden, *Angliae et Hiberniae Nova Descriptio...* (London, 1592).
  31. See Bernard Klein, ‘The Overseas Voyage in Early Modern English Writing’, in *Renaissance Transformations: The Making of English Writing (1500–1650)*, ed. Margaret Healy and Thomas F. Healy (Edinburgh: Edinburgh University Press, 2009), 128–144, here 139.
  32. *Phil. Trans.*, 1665, 1: 99–100.
  33. See D.K. Smith, *The Cartographic Imagination in Early Modern England: Re-writing the World in Marlowe, Spenser, Raleigh and Marvell* (Aldershot: Ashgate, 2008), 10.
  34. *Phil. Trans.*, 1674, 9: 3.
  35. *Phil. Trans.*, 1685, 15: 167–178.
  36. *Phil. Trans.*, 1686, 16: 492.
  37. *Phil. Trans.*, 1669, 16: 1003.
  38. *Ibid.*, 1006.
  39. Anonymous (Pietro Martire d’Anghiera), *The History of Trauayle in the VWest and East Indies...* (London, 1577). Reference to the first section is on page 11.
  40. Cornelius Geraldson, *An Addition to the Sea Iournal, or, Nauigation of the Hollanders vnto Iaua...* (London, 1598).
  41. *Ibid.*, 7.
  42. William Bruton, *Newes from the East-Indies: Or, A Voyage to Bengalla...* (London, 1638).
  43. *Ibid.*, 1.
  44. *Phil. Trans.*, 1686, 16: 45.
  45. *Ibid.*, 49.
  46. *Phil. Trans.*, 1695, 19: 83–110.
  47. *Ibid.*, 85.
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  49. *Phil. Trans.*, 1665, 1: 360–361.
  50. *Phil. Trans.*, 1666, 2: 430.
  51. See Giovanni Tommaso Minadoi, *The History of the Warres betveene the Turkes and the Persians...* (London, 1595); Anonymous, *Nevves from Turkie and Poland. Or a Trve and Compendius Declaration of the Proceedings betweene the Great Turke, and his Maiestie of Poland...* (The Hague, 1622); and Samuel Clarke, *The Life and Death of Nebuchadnezzar the Great...* (London, 1665).
  52. *Phil. Trans.*, 1671, 6: 2151–2253. See also *Phil. Trans.*, 1674, 9: 197–208; as well as *Phil. Trans.*, 1675, 10: 112–122.

53. *Phil. Trans.*, 1684, 14: 433.
54. *Phil. Trans.*, 1695, 19: 129–160.
55. *Phil. Trans.*, 1684, 14: 434.
56. Francis Caron and Joost Schorten, *A True Description of the Mighty Kingdoms of Japan and Siam...* (London, 1663).
57. *Phil. Trans.*, 1669, 4: 985–986.
58. Caron and Schorten, *A True Description*, 45.
59. *Ibid.*, 54.
60. *Ibid.*, 53.
61. See Anonymous, ‘More Observations of Monsieur Taverniers Voyages; Promised in the Next Foregoing Tract of Philosophical Transactions’, 1676, 11: 123–132.
62. *Phil. Trans.*, 1674, 9: 197–208.
63. *Ibid.*, 205.
64. Daniel Denton, *A Brief Description of New-York: Formerly Called New-Netherlands...* (London, 1670).
65. *Ibid.*, 7.
66. Anonymous (Cotton Mather), *A Monitory, and Hortatory Letter to those English, Who Debauch the Indians by Selling Strong Drink unto them...* (Boston, 1700).
67. See Morgan Godwyn, *The Negro’s + Indians Advocate, Suing for their Admission into the Church...* (London, 1680), 3.
68. *Phil. Trans.*, 1675, 10: 400.
69. *Phil. Trans.*, 1676, 11: 625–626.
70. See James Axtell, *Natives and Newcomers: The Cultural Origins of North America* (Oxford: Oxford University Press, 2001), 18–20, particularly the passage in which he refers to Gregor Reisch’s *Margarita Philosophica* (1517) and his oddities in the Europeans’ imagery of the ‘Other’; and Karen Ordhal Kupperman, *Indians and English: Facing Off in Early America* (Ithaca and London: Cornell University Press, 2000), 41–76.
71. Sarah Irving, *Natural Science and the Origins of the British Empire* (London: Pickering and & Chatto, 2008), 69.
72. On pre-Adamism and the position of the Royal Society regarding colonization, see Cristina Malcomson, *Studies of Skin Colour in the Early Royal Society: Boyle, Cavendish, Swift* (Burlington: Ashgate, 2013), 10–21; Sarah Irving’s cited *Natural Science and the Origins of the British Empire* 69–92; and Michael Hunter, *Boyle: Between God and Science* (New Haven: Yale University Press, 2009), 129, 169–171.
73. Anna Suranyi, *The Genius of the English Nation: Travel Writing and National Identity in Early Modern England* (Cranbury: Associated University Presses, 2008), 20.
74. See Malcomson, *Studies of Skin Colour*, 8–9.
75. *Phil. Trans.*, 1665, 1: 91–92.
76. *Phil. Trans.*, 1666, 2: 566.
77. *Phil. Trans.*, 1673, 8: 6007–6008.
78. Here we consider Joseph Blagrove, *New Additions to the Art of Husbandry...* (London, 1675), 1.
79. See Anonymous (John Fitzherbert), *The Booke of Husbandry, Uery Profitable and Necessary for All Maner of Persons...* (London, 1568); and Conrad Heresbach, *Fovre Bookes of Hvsbandry...* (London, 1578).
80. *Phil. Trans.*, 1674, 9: 203.
81. Consider the introductory section on ‘Babel of Tongues: Communicating with the Indians’ in Axtell, *Natives and Newcomers*, 46–78.
82. *Phil. Trans.*, 1676, 11: 623
83. *Phil. Trans.*, 1677, 12: 1065–1069.
84. *Phil. Trans.*, 1685, 15: 988.

85. Tzvetan Todorov, *The Conquest of America* (Norman: University of Oklahoma Press, 1984), 130.
86. *Phil. Trans.*, 1665, 1: 103–104.
87. *Phil. Trans.*, 1676, 11: 714–715. Issue no. 19 was on ‘the best Glue in the world’ and on the ‘manner of the *Turks* in preparing it’; no. 20 is on the *Persians*’ special skill ‘in damaskining with Vitriol’.
88. *Phil. Trans.*, 1677, 12: 929.
89. *Phil. Trans.*, 1695–1697, 19: 228–230.