

Arts and Sciences of Travel, 1574-1762: The Arabian Journey and Michaelis's *Fragen* in Context

Daniel Carey¹

Abstract

The practice of eighteenth-century scientific travel emerged out of a series of traditions that developed over the course of the previous two hundred years. During this period an extensive literature of instruction and advice also appeared, beginning in the sixteenth century with the Humanist intervention to reform travel in the 1570s, together with the instructions issued by trading companies for a variety of voyages. Efforts to control travel and give it observational coherence took on a new impetus under the auspices of the Royal Society in the 1660s as it formulated inquiries for different countries and supplied more general advice on what to observe for travellers and mariners. Viewed from this perspective, the extensive guidelines and questions devised by Johann David Michaelis and his colleagues for the Arabiske Rejse represent the culmination and synthesis of long standing attempts to make travel productive of new knowledge. This essay describes the traditions that informed these contributions and some of the difficulties associated with trying to control travel – including the utopianism of questionnaires, the practical limits of obtaining answers, and the creation of networks to distribute and respond to them.

Eighteenth-century scientific travel – of which the Arabian expedition of Carsten Niebuhr and his colleagues is such a remarkable, though still neglected example – emerged out of traditions that took shape over the course of the previous two hundred years. One of the defining features of the Arabian journey was the amount of instructional literature that accompanied it. The practice of formulating directions and questions for travellers developed historically over the same two centuries. The rise of a secular mode of

travel, governed by related interests of acquiring political information, documenting nature, and enhancing civility, was accompanied by a growing body of advice. One strand of this literature of guidance, known as the *ars apodemica* or art of travel, has received considerable attention – the work directed to regulating Continental travel, which began with Humanist interventions in the 1570s.² Various authorities, from Theodor Zwinger to Justus Lipsius, Philip Sidney, and Francis Bacon, contributed essays, treatises, orations, and letters designed to remind travellers both of their moral duties and the objective of acquiring information valuable to themselves and the state during their expeditions. A second strand of contempo-

1. I am grateful to the Irish Research Council for the award of a senior research fellowship which enabled me to complete the work for this essay. My thanks to Lawrence Baack and Dominik Collet for generously commenting on an earlier draft and to Anne Haslund Hansen and Helmut Rohlfing for helpful information.

2. Stagl (1979, 1995, 2002); Rubiés (1996; 2007); Carey (2007), pp. 65-77; Warnecke (1995); Doiron (1995); Howard (1914).



Fig. 1. Johann David Michaelis (1717–1791). Engraved portrait, produced in 1790 by Johann Gotfried Schmidt after a painting from 1761 by the Danish-German portrait painter Johann Georg Ziesenis, approximately when Michaelis worked on the *Fragen* ... Print in Österreichische Nationalbibliothek, Port. 00150381_01. Reproduced by permission of the Österreichische Nationalbibliothek.

rary guidance has received less attention; it appeared in association with larger scale expeditions beyond Europe, undertaken in the interests of trade, exploration, and colonial settlement during the period. As they increased in number and ambition, such journeys (often made in conjunction with the enterprises of the great trading companies, like the Muscovy Company, the Levant Company, or the East India Company), required their own instructions and directions to maximize the benefits, address the risks, and ensure appropriate behaviour by the participants. Although relatively little attention has been paid to the latter form of advice, it represents part of a shared concern to discipline travel and make it useful that surfaces again and again in the early modern period.

At the same time, there are differences of audience

and occasion in the production of these contributions that we should note, including the fact that Humanist discussions typically addressed an elite, while the “corporate” instructions of trading companies concerned collective enterprises with more substantial numbers of people on board ships. These two traditions were synthesized in the work of the Royal Society in the 1660s, harnessing travel to the cause of natural history by bringing the recommendations of a prominent group of advisers in contact with a broad collective. The group of contacts ranged from humble seamen and captains to governors and diplomatic officials taking part in near and distant voyages that offered potential insight into the natural world and information on an array of valuable commodities and resources.

The moment of the *Arabiske Rejse*, situated in this context, constitutes the maturing of a long established set of related approaches, which created its own distinctive synthesis. The expedition featured the work of educated gentlemen; it enjoyed state sponsorship under royal authority; national prestige was at stake; and it was complemented by elaborate forms of instruction. These include the actual guidelines for the trip itself, issued in the name of Frederik V of Denmark, who commissioned the journey, and the famous *Fragen an eine Gesellschaft gelehrter Männer* of Johann David Michaelis, published in 1762.³ Like all works of instruction on conduct and observation, whether they take the form of “heads” of instruction, Ramist tables, or questionnaires, these works exist, I would argue, in a somewhat separate universe from the journey in its own right, for a range of reasons. There is a utopianism of expectation that surfaces in such documents that is detached from the limitations of human understanding, time, and resources, let alone the implications of mortality visited so devastatingly on the *Rejse*. Nonetheless the ambition signalled by instructions, questions, and directions deserves its own attention. We should be sensitive, equally, to the different modalities and inflections of these writings, even as we recognize that they form part of a shared pattern of

3. Fig. 1.

objectives in transforming travel from mere errancy and self-indulgence to a productive, reputable enterprise with prospectively transformative effects on knowledge.

The purpose of this essay is to offer a set of contexts and considerations related to the near-obsession with instructing travellers and to differentiate various traditions. The first section looks at the Humanist advice literature and the second describes the materials printed by Richard Hakluyt in the sixteenth century relating to long-range journeys outside Europe. In the third section, I turn to the Royal Society's institutional approach to preparing questionnaires. A reciprocal relationship developed over the period studied in this essay between Continental and English authorities, fostered for example by the Royal Society through various connections outside England (and facilitated by the secretary, Henry Oldenburg, among others). In the final section, I look at the *Arabian Voyage* and Michaelis in particular. Throughout, I will consider the range of European sources that commented on travel in order to reconstruct the background to the intervention of Michaelis and his colleagues who instructed the *Arabian Voyage*.

I. Humanism and the art of travel

Humanist attention to the activity of Continental travel began to take on momentum in the 1570s with a series of influential writings. Hieronymus Turler led the way in a decade crowded with contributions in his *De peregrinatione* (1574), dedicated to the three young Barons of Schönburg, based on his family's long history of high-level service to that noble household. Written in the form of a treatise sub-divided into nine chapters, he concluded with an exemplary description of the city of Naples (in nineteen chapters). Italian city-states as the destination of travel, necessitating a particular set of observational strategies, motivated his advice to aristocratic protégés ready to accomplish themselves with languages and other social and political skills. In 1577 (perhaps under Turler's influence), Egnatio Danti produced a table with twenty-six headings under the title "Delle osservatio-

ni de Viaggi" as part of his *Le scienze matematiche ridotte in tavole*, published in Bologna, again prompted by the observational requirements of Italian city-states.⁴ The method of structuring the organization and gathering of knowledge under discrete headings, often subdivided into numerous further branches, reached a high point in the work of Theodor Zwinger, the Basel humanist, physician, and encyclopaedist. He devoted the third and longest book of his *Methodus apodemica* (1577) to four major cities, Basel, Paris, Padua, and ancient Athens, as a model for how to make useful observations. Yet his exploration of travel was far more comprehensive than meeting this objective alone; where Danti had confined himself to a single page of text and Turler to relatively brief chapters, Zwinger's work covered 400 pages, in which he followed an Aristotelian four-fold account of causation. The formal cause of travel he defines, for example, in terms of different occasions such as education or diplomacy; efficient causation speaks to the means of travel, such as material conditions and requirements or modes of transportation; and final causes concern the purpose and results of travel, evident in the knowledge gained.⁵

The aspiration to instruct and direct travellers on their itineraries flourished in the Low Countries, Germany and Switzerland, inheriting and reshaping the *Adelsreise* toward Humanist priorities.⁶ Among the most significant works is Lipsius's 1578 letter to the nobleman Philippe de Lannoy,⁷ published in 1586 and widely disseminated through translations in English, French, and Dutch. Lipsius wrote in the form of a polite epistle, but it is notable that one of his followers, Nicolaus Vernulaeus (a Leuven professor of rhetoric),

4. Danti (1577), p. 50. For a transcription and translation, see Frangenberg (1994), p. 56-58. For instructions in the 1570s for surveying Siena following the Medici conquest, which have some similarities with Danti's concerns, see Guarducci (2005), pp. 71-98.

5. See Liechtenhan (1990), pp. 151-164; Neuber (1994); Molino (2006), pp. 43-67.

6. On the development of the *Adelsreise* see various contributions in Babel and Paravicini (2005).

7. Lipsius (1586), pp. 30-36. For a critical edition, see Lipsius (1978), pp. 197-202.

converted the text into a series of “leges” relevant to travel and observation,⁸ suggesting the potential for adaptation between forms which becomes apparent in the “genre” of the *ars apodemica* or art of travel as a whole. The range of sources under this rubric is considerable. Some of them concentrated on moral advice, while others focused on methods of gathering and organizing information. An important instance of the latter strategy appears in Albert Meier’s *Methodus describendi regiones, urbes et arcus* (1587),⁹ which was devoted entirely to the identification, accumulation and organization of knowledge gathered during the journey. Emulating Ramus’s use of *loci*, he begins with twelve “general sections” or “places of...discourse”: cosmography, astronomy, geography, chorography, topography, husbandry, navigation, the political and ecclesiastical state, and finally literature, histories and chronicles.¹⁰ Thus natural historical description is very much included within the observational field of the traveller. Each section is then broken down into further subtopics of observation. For example, under husbandry the headings include the seasons, winds, healthfulness of the climate; the soil, crops, harvests, the woods (and whether they yield masts for shipbuilding); precious stones; birds, fish, “Noisome and hurtful beasts” (*serpentes* and *viperaria*),¹¹ and “All other commodities of the place that are knowne, either agreeing, or not agreeing with other countries and regions, and whatsoever else that place hath, strange, new, notable, and commodious”.¹² It is obvious that the list overlaps in several areas (such as geography, chorography and topography) and is not particularly coherent. Nevertheless it provides a basic method of

capturing and recording desirable information in a comprehensive fashion.

What Meier provides is essentially the outlines of a chorography. The chorographic tradition had of course an ancient pedigree, with a particular focus on the description of circumscribed territories, including landscape and natural resources, but it was adapted in various vernacular traditions to include antiquarian information, and description of important historical events, august families, and notable buildings. In the German-speaking world, attempts to turn this investigation into a cooperative exercise, based on recommendations on what to observe, can be traced at least as far back as Sebastian Münster in the earlier sixteenth century. Münster’s approach to the challenge is particularly interesting since he recognized that a survey of the whole of Germany was beyond the capacity of any one man, so he published an appeal in 1528 for support in describing “territories, cities, towns, villages, distinguished castles and monasteries, its mountains forests, rivers, lakes and its products, as well as the characteristics and customs of its people, the noteworthy events that have happened, and the antiquities which are still found in many places”.¹³

One text should be mentioned that has often been overlooked in this context, despite its prominence, the *Geographica generalis* of Bernhard Varenius (1650). Among Varenius’s divisions of the subject of geography, he recognized what he called special or particular geography which related to every country,¹⁴ with a further division into headings of the celestial, terrestrial and human. The celestial related to stars and

8. Depuydt (1992), pp. 21-33.

9. For an edition, see Rassem and Stagl (1994), pp. 160-168. Meier’s work was commissioned by Heinrich Rantzau, the humanist nobleman and governor of Schleswig-Holstein under successive Danish kings from 1556 till shortly before his death in 1598 or 1599.

10. Meier (1589), B1r.

11. Meier (1587), A7r (under heading VI “Georgica”); Rassem and Stagl (1994), p. 164.

12. Meier (1589), pp. 10-11.

13. Translated in Strauss (1959), p. 26. See Münster’s *Erklärung des neuen Instruments der Sonnen* (Oppenheim, 1528) which included *Item cyn vermanung ... an alle liebhaber der Küstenn, im hilff zu thun zu warer unnd rechter beschreibung Teütscher Nation*, reprinted elsewhere in 1534, 1544, 1545, 1575. For discussion of this document and Münster’s methods of gleaning information from travellers and others, see McLean (2007), pp. 147-164.

14. The first to use these terms was Keckermann (1611), but as Keckermann makes clear (p. 6) he followed Ptolemy’s distinction between geography and chorography. “Special” is used because it treats the world *in specie* (p. 163).

their motion, the distance of the country from the equator, and, although he discounted it, the particular governing (*praeficiunt*) astrological sign of every country. He identified ten terrestrial headings, including the limits and circumference of the territory; figure; magnitude; mountains; waters; woods and deserts; fruitfulness or barrenness (and the fruits it produces); minerals; and animals. His third heading was that of human geography. Here he mentioned another ten “affectiones” or properties: the stature of the natives (such as shape, colour, length of life, and diet); traffic and arts; “virtues, vices, genius, and learning [*scholae*]”; social customs in the form of burials, marriages, christenings, etc.; speech and language; the mode of government (*Regimen politicum*); religion and ecclesiastical government; cities and places of note; memorable histories; and the famous men, inventions, and artifice of the place.¹⁵ In this digest Varenius covered a vast range of subjects comprehending natural, social and political history. The significance of the piece lies in its applicability to any country, which gives it a great deal in common with the far more extensive advice supplied by Zwinger, Meier, and others. Varenius presented this subject with headings but he also set out the structure in the form of a table.¹⁶ For that matter, he could just as easily have presented the headings as questions: they serve the same function of directing and structuring the observation of travellers.

English engagement with this tradition began in the 1570s and blossomed in the seventeenth and eighteenth centuries. Several of the major early Continental works were quickly translated, including *The Traveler of Jerome Turler* (1575) which appeared just a year after the Latin original; this text found a readership, among others, in Gabriel Harvey and Edmund Spenser.¹⁷ Meier’s 1587 *Methodus* was translated in 1589

by Philip Jones as *Certaine briefe, and speciall Instructions*. Jones widened the audience considerably beyond the “homines nobiles ac docti” cited in Meier’s title to include his own list consisting of *Gentlemen, merchants, students, souldiers, mariners, &c. Employed in service abroad, or anie way occasioned to converse in the kingdomes, and governments of forren princes*. In his dedication Jones mentions that his “good and learned friend, M. Richard Hakluyt”, had encouraged him to dedicate the translation to Sir Francis Drake.¹⁸ Three years later, in 1592, Sir John Stradling translated (and augmented) Lipsius’s letter on travel for an English audience with a dedication to the third Earl of Bedford.¹⁹

Of course the impact in England of Continental traditions of structuring travel advice occurred without needing to enter the English vernacular. The influence of Zwinger, whose work was not translated, is nonetheless apparent in Sir Thomas Palmer’s comprehensive *Essay of the Meanes how to make our Travailes into foraine countries, the more profitable and honourable* (1606). Palmer included four extensive tables summarizing his text and providing a structured conception of the relationship between different types of travel. But Palmer was not the first to employ Ramist tables in this context in England. William Davison, the disgraced Secretary of State, produced a synoptic table focusing on political observation. Although the work did not appear in print until 1633, the occasion for its composition was the departure of Davison’s son Francis, then enjoying the patronage of the Earl of Essex, on a Continental journey in 1595 (Francis would write, as a result, an account of Saxony).²⁰ Robert Dallington made use of tables in two works on France and Italy published in 1605, based on his Continental travels in 1595-1600. His account of France was prefaced by a discourse on the method of travel, which shows the close relationship between the formal essay and the synoptic table. In his tables for France and Italy,

15. Varenius (1650), pp. 2-5. For discussion of his work and influences, see Schuchard (2007); and Kastrop (1982), pp. 79-95.

16. Varenius (1650), table at p. 9.

17. Spenser gave a copy to Harvey, his Cambridge companion, who annotated it extensively. For a facsimile of Harvey’s copy, see Turler (1951).

18. *Certaine briefe, and speciall Instructions*, trans. Philip Jones (London, 1589), A3r.

19. Stradling (1592).

20. Davidson (1633), pp. 1-24. On Francis Davison, see Hammer (1996), p. 364 + nn.

Dallington also allocates attention to natural history under two headings – cosmography and chorography. The former includes climate and astrological influences, while he breaks the latter down into hydrography and geography, covering lakes, rivers, and their navigability, and the provinces, commodities, and population of the territory, respectively.²¹

II. Instructions and directions for long range travel

To fill out a picture of the strategies employed in order to direct travel in late sixteenth century we need to consider attempts to regulate and inform long range journeys. Richard Hakluyt's landmark compilation promoting English trade and colonial expansion, *The Principal Navigations, Voyages, Traffiques, and Discoveries of the English Nation* (first edition 1589; expanded 1598-1600), provides a valuable resource.²² Among the multitude of documents included by Hakluyt, he printed a number of travel instructions. These writings indicate several things: first, that travel outside of Europe was equally subject to efforts to give it discipline, purpose, and observational coherence. Second, they demonstrate a practical emphasis on accumulating knowledge of commodities, resources, and markets, as well as trade techniques that becomes so conspicuous in the later seventeenth century. Finally, those who commissioned voyages (through small or large-scale joint-stock initiatives) gave their advice to groups rather than individuals and they therefore anticipated a collective project to make observations. The rationale for such an approach resulted, to some extent, from the conditions of travel onboard ship where the party consisted of seamen, officers, and merchants, as opposed to the different circumstances facing individual noblemen or gentlemen journeying overland (albeit with occasionally extensive entourages). But it also

speaks to the backing of institutions in a number of cases, whether trading companies or less formally constituted assemblages of investors, which needed to have information gathered in a different fashion through a certain amount of implicit repetition and shared effort.

The earliest work of instruction printed by Hakluyt dated from 1553 and came from Sebastian Cabot: "Ordinances, Instructions, and Advertisements" prepared for Sir Hugh Willoughby and Richard Chancellor in a mission to find the Northeast Passage (though they failed to reach their proposed destination, the journey did result in the establishment of the Muscovy Company). This wide-ranging document covers matters such as discipline on the ship and the need for courteous and gentle treatment of anyone encountered during the journey. At the same time the task of documentation was paramount:

The names of the people of every Island, are to be taken in writing, with the commodities, and incommodities of the same, their natures, qualities, and dispositions, the site of the same, and what things they are most desirous of, & what commodities they will most willingly depart with, & what metals they have in hills, mountains, streames, or rivers, in, or under the earth.²³

The ethnographic component of the investigation was largely subordinated to commercial interests, but Cabot also recommended learning the "natures and dispositions" of local people.²⁴

The importance of navigational information was also stressed. Cabot wanted a record of coastlines and tides, along with latitudes.²⁵ Advice on a later mission in search of the Northeast Passage, this time undertaken by Arthur Pet and Charles Jackman in 1580, came from William Borough (chief pilot of the Muscovy Company from 1572). Borough, who had travelled on the 1553 expedition directed by Cabot, gave similarly detailed nautical instructions to take regular soundings, especially as the voyagers came across any

21. Dallington (1605?), A2v; Dallington (1605), A2v. For discussion, see Rubiés (1996), pp. 167-170 (with reproduction of the tables); Hölting (1984), pp. 147-177.

22. I have discussed this subject at greater length in Carey (2009).

23. Hakluyt (1903-1905), Vol. 2, p. 203.

24. Hakluyt (1903-1905), Vol. 2, p. 202.

25. Hakluyt (1903-1905), Vol. 2, p. 197.

coastlines, to note wind direction, and variations in the compass. When they sighted land they should draw a map and identify prominent features of it, any bays, harbours or river mouths, providing the latitude and longitude, the times of tides and the changing height of the water. Borough went on to suggest what they should observe on land:

But withal you may not forget to note as much as you can learne, understand or perceive of the maner of the soile, or fruitfulnessse of every place and countrey you shall come in, and of the maner, shape, attire and disposition of the people, and of the commodities they have, and what they most covet and desire of the commodities you cary with you.²⁶

Both Cabot and Borough anticipated, in effect, a reciprocal process of discovery, at least in terms of commercial needs and desires.

The most substantial instructions printed by Hakluyt came from an important source, his elder cousin, also named Richard Hakluyt, a lawyer at the Middle Temple. The elder Hakluyt offered guidance on establishing a settlement in North America (for the benefit of Sir Humphrey Gilbert and, after Gilbert's death at sea, for Martin Frobisher on his third voyage), along with two sets of instructions containing detailed recommendations for making observations on cloth and dyeing in Persia and the Ottoman Empire.²⁷ He also made recommendations to Pet and Jackman in 1580 which share the concerns of Cabot and Borough, mentioning the importance of noting any islands they encountered (with potential for stapling or as entrepôts), surveying the soil, woods, springs, and wild beasts, and the quality of the harbours and havens. They might also locate good sources of naval stores like masts, tar and hemp.²⁸ But the majority of this document focused on the enticing possibilities once Pet and Jackman reached Cambalu or Quinsay (Beijing or Hangzhou). Much of what he had to say re-

lated to the long list of wares they should bring with them for sale to the Chinese, but he also included recommendations on what to do and observe. Here his advice took on the character of *ars apodemica* essays instructing gentlemen during their tours of European capitals and city-states. The first thing to record was Chinese military power by land and sea – the size and provision of their navy, the fortification of cities, and the supply of “calivers” (muskets), powder and shot, pikes, bills and halberds, swords and horses. The list of things worth attending to included buildings and household ornaments, apparel and furniture, but these points were prompted by commercial considerations. With such information, he claimed, merchants could guess at the commodiousness of their living and also their “wants”.²⁹ For similar reasons, Pet and Jackman should take note of shops and warehouses, and what they contained; and food supplies in the form of grain, fruit trees, and fish, while remarking on their relative abundance. A Continental survey might have investigated such matters as part of an inquiry into national strength; here it yields an insight into economic resources and potential markets.

Further archival research would, I suspect, reveal a more consistent pattern of equipping voyages with written instructions, some governing conduct during the journey and others requesting specific data and the collection of items of interest, of which significant traces appear in Hakluyt's encompassing collection. The archives of the trading companies constitute an obvious resource to investigate further. For example, the records of the East India Company's activities in Japan include an interesting document entitled “Progress of questions and answers concerning Japon” from 1627 sent by the company's factors in Batavia.³⁰ Earlier in the century the famed Flemish naturalist Carolus Clusius devised a plan to involve the Dutch East India Company in a related project. Recognizing the potential for travel (doubtless demonstrating his background in medical botanizing as well as a broader Humanist formation), he developed a set of in-

26. Hakluyt (1903-1905), Vol. 3, pp. 261-262.

27. Hakluyt (1903-1905), Vol. 3, pp. 249-251; Vol. 5, pp. 229-243; Vol. 7, pp. 244-250.

28. Hakluyt (1903-1905), Vol. 3, p. 266.

29. Hakluyt (1903-1905), Vol. 3, pp. 268, 266.

30. Farrington (1991), Vol. 2, pp. 970-972.

structions for making observations and collecting samples designed for apothecaries and surgeons travelling in service of the company after its founding in 1602. However, his efforts did not meet with success and he later complained of receiving nothing from the VOC voyages.³¹

III. The Royal Society and its influences

The widespread attempt to exert control over travel continued throughout the seventeenth century. The issue of moral deportment remained a focus of guidance for travel on the Continent, alongside familiar recommendations on what to observe. In the 1660s the Royal Society inherited and reshaped this tradition in important ways that directly influenced European practice in the period and gave a new impetus and rationale to the use of questionnaires and instructions for travel. The connection is immediate in the case of several prominent early fellows: John Evelyn, who was active in the founding period of the Society, prefaced his 1652 account of his travels in France with an essay on the art of travel.³² Robert Southwell, president of the Society from 1690-95, left a manuscript essay in this genre, “Concerning travelling” (1658), and Isaac Newton may have drawn on this in creating a notable letter of advice of his own on travel from 1669.³³ As a gentlemanly elite, the constituents of the Society constituted the target audience for these works. Their collective recognition of travel as a resource for conducting natural history was indebted, in part, to their familiarity with how to structure Continental excursions in a useful manner. At the same time they extended the scope of questions and instructions beyond Europe in a way that bears reminders of materials published by Hakluyt several decades before, both in terms of strategy and content. Wheth-

er this came about by reading Hakluyt or simply indicates a convergence in techniques for controlling travel and realizing its potential is a matter of conjecture.

The Royal Society’s perspective on the utility of travel received a further crucial contribution from Francis Bacon and subsequently Samuel Hartlib through the circle formed around him in the Interregnum. Bacon himself had written perhaps the best known *ars apodemica* essay, “Of Travel” (1626), together with one or more unpublished works of a similar kind composed in association with the Earl of Essex,³⁴ but it is his work on the reform of knowledge that represents the key in this context. Lisa Jardine notes that Bacon’s programme of natural history allows for two preliminary groupings of material accumulated through inductive observation: “the material may be arranged according to a series of questions, or particular topics devised by the investigator, which focuses attention on particularly important aspects of the subject.”³⁵ Questions and headings play a significant role in organizing natural histories, without ostensibly prejudicing knowledge in the process.

Bacon gives us the clearest insight into this in his “Parasceve, ad historiam naturalem et experimentalem” (“A Preparative to a Natural and Experimental History”), part of the Great Instauration. Here he emphasizes the “army of workers” needed to advance the project, an undertaking worthy of a king in its scale and ambition.³⁶ At the end of the short work he presents a catalogue of 130 different “Histories” covering an enormous array of subjects. Three broad divisions structure the investigation as a whole – the history of “generations”, “pretergenerations” and “arts” – brought together in their “abundance and variety”.³⁷ In his list of histories, Bacon includes, among many others, the history of the earth and sea, their shape

31. See Ogilvie (2006), pp. 255-256, for a translation of the document. On Clusius, see Egmond (2010).

32. Evelyn (1652), A5r-B12r.

33. Newton to Francis Aston, 18 May 1669, in Turnbull, Hall and Tilling (1959-1977), Vol. 1, pp. 9-11. The Southwell manuscript is King’s College Library, Cambridge, Keynes MS 152.

34. See the editorial discussion and text of three letters composed for the fifth Earl of Rutland in Bacon (2012), pp. 607-673, 964-972.

35. Jardine (1974), p. 136.

36. Bacon (2004), p. 451.

37. Bacon (2004), pp. 455, 457.

and extent; geographical natural history; the history of winds, clouds, and rain; histories of trees, plants, and shrubs, of fish, birds, quadrupeds, and serpents. A series of histories related to human beings then follows, some of which are physical, others psychological, and others still relate to trades and human practices (or arts). Thus he mentions human shape, stature, appearance, and how they vary according to race and climate; physiognomy; the faculties, humours, emotions, body types, nutrition, music, drugs, and medicine; dyeing, wool manufacture, and goods made from silk; pottery, wickerwork, gardening, and military matters.³⁸ The copiousness of the undertaking is certainly not in doubt.

Bacon presents these histories not in a dichotomous structure defining relationships in advance (in the manner of Ramus) but essentially as a series of heads or titles. He also emphasizes that questions can be put to good use in this investigation, although they should concern facts rather than causes.³⁹ Questions have the valuable function of provoking and encouraging further inquiry. For example, in relation to the history of the earth and sea, the question can be asked whether the Caspian has tides and whether a southern continent exists (*terra australis*) or only islands. The influence of Bacon's legal training is also apparent. Before listing his proposed histories, he indicates that he intends to supplement them with particular questions to provide instruction in what to investigate and record: "These questions are like a kind of particular *Topics*; for (taking my cue from civil suits) I mean, in this *Great Action* or *Trial*... to cross-examine by articles the arts and nature itself."⁴⁰ The reference to topics reminds us of the organization of knowledge into headings or *loci communes*, while the technique of cross-examination draws on legal practice.

Bacon's technique had a direct influence on Samuel Hartlib and also on Robert Boyle whose "General

Heads for a *Natural History of a Countrey, Great or small*" (1666) became the leading publication used by the Royal Society in directing travel. The case of Hartlib is significant, in ways that have not been appreciated, because he published "An Interrogatory Relating more particularly to the Husbandry and Natural History of Ireland" in 1652 as part of *Samuel Hartlib His Legacie*,⁴¹ which directly influenced Boyle. The "Interrogatory" was frequently detached and circulated separately,⁴² and Hartlib supplied Boyle with 20 copies of it when Boyle was visiting Ireland in 1654.⁴³ This questionnaire (the work of a Dutch physician, Arnold Boate), consisted of 362 alphabetical entries on natural history, commodities, and trade, with queries attached to each. The focus on documentation, evident in the wish to determine whether different animals, birds, or trees exist in Ireland, complements the governing concern with establishing the country's natural resources, including food stuffs, methods of animal husbandry and agriculture, as well as trades and manufactures of different kinds. Basic surveying of land with arable potential, rivers, and shores supports the plan of assessing Ireland's suitability for commercial and agricultural development in the context of the Cromwellian reconquest.

Soon after its foundation, the Royal Society demonstrated an institutional interest in developing questionnaires on diverse locations together with more general advice, which they circulated in print and through a wide network of personal and institutional contacts. The methodological attraction of inquiries clearly resulted from Bacon's impact on their research programme, but arguably Hartlib's influence was also significant in this context. If these connections strike us immediately, the Humanist background of advice on travel and chorography was equally important. At the same time, the content of the inquiries for specific territories and their focus on destinations associated

38. Bacon (2004), p. 485.

39. Bacon (2004), p. 469.

40. Bacon (2004), p. 473. See the useful discussion of inquiries and the law in Martin (1992), pp. 165-166.

41. Hartlib (1652), R11-V11.

42. See Coughlan (1994), pp. 298-317.

43. Hartlib also provided Boyle with additional inquiries of his own he hoped he would answer. Boyle (2001), Vol. 1, pp. 169, 179-80.

with English trading and colonial interests continues a tradition that appears in the instructions printed by Hakluyt.

At a meeting of 6 February 1661, the Society established a committee assigned to devise “proper questions to be inquired of in the remotest parts of the world”, featuring a number of key figures from the early life of the organization, including Viscount Brouncker, Sir Robert Moray, Robert Boyle, John Wilkins, John Evelyn, and Henry Oldenburg.⁴⁴ In due course, the Society produced sets of questions for Turkey, Egypt, and Persia in the Near East; Poland, Hungary, and Transylvania in Europe; for Surat and the East Indies, covering territory from South to East Asia; for Guinea – the only in sub-Saharan country to be included; and for the New World, represented by questions for the Caribbean and two sets of pairs – Virginia and Bermuda, and Guiana and Brazil; finally, Greenland and Iceland were the subject of separate inquiries.⁴⁵ After the *Philosophical Transactions* began publication in 1665, Oldenburg communicated the results to a wider public. At the same time, the Society developed directions specifically for mariners, continuing a tradition apparent in Hakluyt. Laurence Rooke’s “Directions for Sea-men, bound for far Voyages” appeared in the *Philosophical Transactions* in 1666.⁴⁶ The plan was to enlist captains and pilots in the task of systematic observation, with institutional backing from the Admiralty (returning mariners were asked to deposit a fair copy of their findings with the Lord High Admiral, the Duke of York, and another at Trinity House where fellows of the Society could consult them). The “Directions” express the same need for reliable nautical information sought by Hakluyt: the variation of the compass, the ebb and flow of tides, especially near river mouths and promontories; and the direction of currents. They asked for maps of

coasts and ports, soundings of depths along shorelines, notes on the sea bottom, and winds, but also for experimental samples of sea water taken in different latitudes. Robert Hooke’s instruments for taking soundings and for collecting sea-water at depth appeared as an appendix to this work in the subsequent number of the *Philosophical Transactions*.⁴⁷ In a later number of the journal Henry Oldenburg printed expanded “Directions for Observations and Experiments to be made by Masters of Ships, Pilots, and other fit persons in their Sea-Voyages”.⁴⁸

The Royal Society also recognized the need for more general advice on what to observe in the midst of travel, and Robert Boyle was prevailed upon to supply “General Heads for a *Natural History of a Country, Great or small*”, a four-page piece published in the eleventh number of the *Philosophical Transactions* in 1666.⁴⁹ Boyle’s important document, which was tirelessly circulated by Henry Oldenburg (along with copies of inquiries for specific destinations),⁵⁰ is perhaps the best known single text in this tradition. A version of the work, together with the Royal Society’s inquiries for specific countries and regions, appeared after Boyle’s death as *General Heads for the Natural History of a Country, Great or Small* (London, 1692).⁵¹

These different contributions represented a collective scheme to enlist travel into the project of natural history. They come in different forms, identified either as “inquiries”, “heads” or “directions”, with their own

44. See Hunter (2007).

45. For these and other discussions of inquiries, see Birch (1756-1757), Vol. 1, pp. 68, 69, 79, 119, 130, 144, 165-166, 180, 192, 199, 297-298, 318-319.

46. Rooke (1665/6). They were prepared in January 1662 (Deacon (1997), p. 75).

47. “An Appendix to the Directions for Seamen, bound for far Voyages”, *Phil. Trans.* 1/9 (1665/6), pp. 147-149.

48. *Phil. Trans.* 2/24 (1667), pp. 433-448. This document added new instructions for use of a hydrometer. On this work, Rooke’s “Directions”, and the Society’s circulation of directions to seamen and others, see Deacon (1997), pp. 75-86. 49. Boyle (1666).

50. See, e.g., Oldenburg (1965-1986), Vol. 3, pp. 58, 87, 207, 243, 276-277, 340-341, 526; Vol. 4, pp. 133, 166-167; Vol. 5, pp. 315, 440. Oldenburg apparently regarded Boyle’s “General Heads” as a collaborative piece since he produced a restructured version of the document (printed as an appendix in Hunter (2007), pp. 22-23).

51. This volume may have been compiled by Denis Papin. See the editorial discussion in Boyle (1999-2000), Vol. 5, pp. xli-xlv.

preoccupations, method, and morphology, but they should be seen ultimately as complementary approaches geared around loci of travel and available resources (such as the Admiralty, the trading companies, and ties to individuals embarking on journeys).

Several points are worth making about these different contributions. The inquiries for particular countries and territories have a decidedly miscellaneous character, frequently requesting information on incidental points relevant to specific countries or territories derived from the reading of travel books and other printed sources. They focus often on trades, manufactures, and commodities, as well as curiosities of nature. While they exhibit certain recurring interests they cannot be described as systematic. Robert Hooke's inquiries for Greenland constitutes an exception in approaching the task in a way that resembles a chorography in its completeness, and it is perhaps significant in this respect that the territory in question is bounded and therefore lent itself to such an analysis. Boyle's "General Heads" was often distributed together with the inquiries for specific destinations, or otherwise mentioned as a companion piece. This indicates an impulse to gather information in an inclusive fashion and to equip travellers in making observations covering a range of headings suitable for any country they encountered; but it also suggests that these were continuous efforts. Boyle's text links together the traditions I have described by drawing on Varenius and the Humanist use of topics, while also showing traces of the influence of Hartlib's more specific concerns in Ireland.

The Society's inquiries for Egypt are of particular interest in setting a context for Michaelis's intervention a century later. The development and distribution of these inquiries was hastened by receipt of a request from the linguist and scholar Hiob Ludolf, writing on behalf of the Ernest I, Duke of Saxe-Gotha, who had a member of his household travelling to Egypt and Ethiopia and who solicited the Society's questions about the country.⁵² Although he was not named, this individual is certainly Johann Michael

Wansleben, whose journey as far as Cairo commenced in 1663, although it is not clear if he received the questions before his departure in June.⁵³ Boyle and Thomas Henshaw were asked to respond to the request for questions, and Henshaw seems to have come prepared, "having been already desired to think upon this matter".⁵⁴ Fifteen inquiries for Egypt are recorded in the minutes. As a whole they testify to a considerable level of curiosity on different subjects, but they nonetheless appear relatively random in sequence and significance. In terms of sources, they suggest the influence of Henshaw's reading of Pierre Belon and Diodorus Siculus at some stages. Among the more straightforward requests are for information on rainwater and nitre, together with somewhat more specific natural historical matters such as whether the female palm tree is only fruitful next to male palm trees and whether the earth near the Nile

53. Collet (2007), p. 139n. Wansleben had been resident in London, after arranging for the publication of Ludolf's *Lexicon Aethiopico-Latinum* (1661). Following his entrance into the Dominican order he came to France in 1670 in a successful search for patronage from Colbert; his *Relatione dello Stato presente dell'Egitto* (Paris, 1671) was reviewed in the *Phil. Trans.* 6/71 (1671), pp. 2160-2162.

54. Birch (1756-1757), Vol. 1, p. 297. Collet (2007), p. 139n, maintains that not Thomas Henshaw but his brother Nathaniel (also a fellow of the Society) was the author of the questionnaire on the basis of the copy in the Royal Society's Classified Papers (CP XIX Nr. 8) which indicates "N. Henshaw". However, the minutes assign the document to "Mr. Henshaw" and there are reasons for identifying this as Thomas Henshaw specifically. The minutes distinguish consistently between Mr. and Dr. Henshaw. Nathaniel earned his MD at Leiden, while Thomas trained in law, indicating that the latter is being referred to in connection with the Egyptian inquiries. See Birch (1756-1757), Vol. 1, p. 240, where their first names and Nathaniel's medical degree are noted. The inquiries for Egypt ask about the nitre sold there and its relationship to "our common saltpeter" (Birch (1756-1757), Vol. 1, p. 297). Thomas Henshaw wrote "The History of the Making of Salt-Peter", included in Sprat (1667), pp. 260-276 (followed by his "History of Making Gun-Powder" (pp. 277-283)). In his discussion of saltpeter, Henshaw refers to Belon's travels in Egypt and his report on it, and he remarks that "I have often enquired amongst our *London Drugsters for Egyptian Nitre*" (pp. 260, 261).

52. Birch (1756-1757), Vol. 1, p. 297.

grows heavier as the river “increases”. Other inquiries shade into the area of productive practices and potential commodities, with questions about drugs in common use that are unavailable in Europe; the existence of wooden locks that are as tough as iron; yellow amber (from Belon and Diodorus); and information on a tree said to produce a wool softer than silk. In relation to human health, he asks whether no one dies of the plague once the river floods and whether children born at eight months survive. The crocodile is a subject of particular fascination, with questions about whether Arabs can charm it; whether crocodiles of 30 feet in length grow from an egg no bigger than a turkey’s, and if it is true that the ichneu-mon or water rat can kill a crocodile by skipping into his mouth and gnawing his way out “as old writers affirm”. The editorial perspective is apparent in the question of whether the appearance of men’s arms and legs out of the ground on Good Friday at a place five miles from Cairo continues “and how that imposture is performed”.⁵⁵

The Society’s method of producing inquiries had impact in Europe as its approach and institutional profile became known. This is evident at an early point in its history, as we have just seen with the Duke of Saxe-Gotha, and it also appears in the exchange between Oldenburg and Melchisédech Thévenot, the important French travel editor and convener of a circle known as the Montmor Academy in Paris in its final years (1663-65). Thévenot had been in correspondence with Oldenburg in 1661, and the group he led devised a scheme to supply voyagers with “Mémoires” directing them to make useful observations.⁵⁶ Elsewhere, Martin Fogelius, a Hamburg professor of logic and metaphysics, also corresponded with Oldenburg on this subject. Fogelius provided Friderich Martens, a barber-surgeon who took part in a whaling expedi-

tion in 1671, with a translation of the Society’s inquiries for Greenland (composed by Robert Hooke and published in the *Philosophical Transactions* in 1667), to which he added his own questions, which informed Martens’s highly successful *Spitzbergische oder Groenlandische Reise Beschreibung* (1675). Fogelius wrote to Oldenburg on 31 January 1671/2: “I have by me a relation of Greenland, as they call it, described in German by a surgeon, in which all the plants, animals, varieties of snow, etc. are curiously depicted in a lifelike way. He also answers many of the headings which your Society proposes for the consideration of travelers. I did not wish him to write anything beyond what he had ascertained very exactly.”⁵⁷

IV. Michaelis and the Arabian Voyage of 1761-1767

From the account I have provided it is clear that efforts to control travel and to exploit its potential in advancing knowledge had occurred in various quarters across the sixteenth and seventeenth centuries, through the initiatives, among others, of trading companies and learned societies, sometimes rooted in practical and commercial interests and sometimes guided by Humanist principles. This pattern continued in the eighteenth century on an expanded scale. One of the most notable contributions in the period prior to Michaelis was made by Gerhard Friedrich Müller in connection with the Second Kamchatka Expedition (1733-43), sponsored by the Russian Academy of Sciences. In 1740, Müller prepared a remarkable document containing 1,228 questions under six separate headings. The likelihood that Michaelis was aware of this project is increased by the fact that he corresponded with Müller (four of Müller’s letters to him survive). Müller’s letter of 18 October 1762 from

55. Birch (1756-1757), Vol. 1, pp. 297-299.

56. See the “Project de la Compagnie des Sciences et des Arts”. A copy is printed in Huygens (1891), Vol. 4, pp. 325-329. For discussion, see Dew (2006), pp. 39-59, esp. pp. 46-49. On Thévenot’s no longer extant correspondence with Oldenburg from 1661, see Oldenburg (1965-1986), Vol. 1, p. 399n.

57. Oldenburg (1965-1986), Vol. 8, p. 516. Martens noted that Fogelius helped him with further inquiries of his own, while arranging the work into order and identifying various plants; see Martens ([1675] 2002), pp. 19-20. Robert Hooke alluded to Fogelius’s use of his inquiries in the preface to Knox’s *Historical Relation* (Knox 1681), sig. (a)3r.

St. Petersburg anticipated the arrival of Michaelis's *Fragen* and their usefulness.⁵⁸

Viewed from this perspective, the extensive instructional materials that accompanied the *Arabian Voyage* suggest an intriguing synthesis and maturing of traditions that had developed over the course of the two previous centuries, introducing a number of elaborations while echoing concerns that had accumulated over decades of prior practice in different contexts. Immediate inspiration may also have come from Michaelis's need to avoid the failure in 1752 associated with his Göttingen colleague, Albrecht von Haller (president of the Göttingen *Akademie der Wissenschaften*), who attempted with little success to instruct and coordinate a naturalist and collecting expedition to America.⁵⁹

The key documents associated with the Arabian voyage to consider are the Royal Instructions issued in the name of Frederik V and the lengthy *Fragen* of Michaelis (covering 350 pages in the Frankfurt octavo). These were joined by questions from the *Académie Royale des Inscriptions et Belles-Lettres*, also printed by Michaelis in his volume.⁶⁰ We can add to this list Linnaeus's *Instructio peregrinatoris* (1759) which the Royal Instructions cited as a source of rules for the naturalist Peter Forsskål.⁶¹ Thus the project to inform the journey was effectively a collaborative one across Europe, with Michaelis at the centre of it.⁶²

In these contributions we see once more the integration of questions, directions, "heads" and instructions, all of which were used to achieve the goal of giving the expedition discipline and observational coherence. At the same time, the instructional interventions indicate a tension by seeking to manipulate action at a distance without acknowledging their utopian aspirations. In the case of the *Arabian Voyage*, this appears in the huge expectations placed on the travelers and their powers of investigation,⁶³ the limitations of communicating the inquiries, and of course the implications of mortality (four of the five commissioned scientists died during the journey).⁶⁴ Although

for questions from the learned in the *Göttingische Anzeigen von gelehrten Sachen* 1:16 (7 February 1760), pp. 129-131, which resulted in the reply from the Académie Royale des Inscriptions et Belles-Lettres. For other individual replies to the call for questions, see Michaelis (1794-1796), Vol. 1, pp. 419-444. Michaelis thanked these correspondents by name in the foreword to his *Fragen* (Michaelis (1762), b2v). The originals are in the Danish State Archives: Tyske Kancelli, Udenrigske Afdeling, Realia, Den Arabiske Rejse I-III, 1756-70, parcel 3-003, no. 86. In addition, the artist Anton Raphael Mengs wrote to Frederik Christian von Haven with questions about Egyptian architecture and related art which he hoped he might answer on the tour, although his inquiries were not included in the Royal Instructions or Michaelis's questionnaire. The letter, which survives only in von Haven's transcription (The Royal Library, Copenhagen, NKS 133,II, 236), is transcribed in full and discussed in Haslund Hansen (2012), pp. 113-117.

63. On 18 January 1763, von Haven wrote to Bernstorff's private secretary, Christian Friedrich Temler, noting the difficulties involved: "Ich kann noch nicht rechnen, dass ich den vierten Theil von dem Umfange der arabischen Sprache weiss, und man muss erst das Bekannte wissen, ehe man etwas Unbekanntes sagen kann." (I cannot even say that I know a fourth part of the circumference of the Arabic language, and you have to know the known first before you can say something about the unknown). Michaelis (1794-1796), Vol. 2, p. 92. In the same year Carsten Niebuhr sent a private letter to Temler also airing his frustrations over what the *Fragen* entailed when he received the work in Mumbai. Preserved in Berlin-Brandenburgische Akademie der Wissenschaften: Nachlaß C. Niebuhr, Nr. 28.

64. The Swedish orderly also died, a dragoon named Lars Berggren. Michaelis had doubts about von Haven's health from the start but Forsskål's demise took him by surprise.

58. The four letters from Müller to Michaelis between 1757 and 1762 are in the Niedersächsische Staats- und Universitätsbibliothek Göttingen (G² Cod. Ms. Mich. 326, fol. 227-230); the 1762 letter is fol. 230. On Müller see Bucher (2002).

59. Collet (2012), pp. 43-44.

60. These were also published with a separate preface in *Histoire de l'Académie Royale des Inscriptions et Belles-Lettres* 29 (1764), pp. 1-30, covering the years 1758-60. On the Académie's document and related records in its archives, see Detalle (2003).

61. Michaelis (1762), d2r-v. Linnaeus was the *praeses* and Eric Anders Nordblad the respondent. In fact, Forsskål himself (who studied with Linnaeus) had drawn the attention of Michaelis to the existence of this work in a letter of 25 September 1759 and sent him a copy for Niebuhr's use in particular. Michaelis (1794-1796), Vol. 1, p. 407.

62. Michaelis issued a notice of the planned journey and call

the group departed with the Royal Instructions, those of the Académie, Prof. Christian Gottlieb Kratzenstein's contribution, and the queries of individuals who responded to Michaelis's call, Michaelis's own extensive compilation of *Fragen* only arrived in instalments, with a full set being available finally by 1763, virtually after the fact.⁶⁵ Thus Michaelis's "questionnaire" (if that is the way to describe it) continued the phenomenon of existing in a separate textual universe, independent of the journey itself.

The Royal Instructions set out the working relationships, tasks, and protocols for the group.⁶⁶ Michaelis prepared them, with a few supplements from various Copenhagen professors and the foreign minister, J.H.E. von Bernstorff.⁶⁷ In this respect they constitute a more sophisticated form of the kind of instructional document that was evidently widely used in organizing long distance voyages by trading companies, as we saw in the case of Sebastian Cabot. Much more attention is given in the Arabian instructions to the differentiation of roles for the participants, each with individual assignments and methods of recording their observations.⁶⁸ This division of la-

bour in generating information occurs under disciplinary and thematic categories that largely replicate those supplied to travellers in the late sixteenth century and seventeenth centuries, for example, by Albert Meier or Bernhard Varenius; however, neither Meier nor Varenius addressed the many competences required to accumulate the necessary data or assigned different individuals' responsibility to investigate them. Of course, the *Arabian Voyage* ended up, unexpectedly, replicating this older tradition when Niebuhr inherited responsibility for the questions delegated to his deceased colleagues; as such, he occupied a position closer to that of earlier travellers armed with a series of questions on quite diverse topics, all of which required attention.

The Royal Instructions strike a familiar note by reiterating the need to keep journals;⁶⁹ this practice was a staple of instructional strategy apparent in the early literature, whether on board ship or journeying on the Continent for personal, social and professional gain. The Royal Instructions also mention in this context the need for clarity of expression in keeping these notes, in order to facilitate access to the information they contained in case the traveller should die before returning – a prophetic piece of advice.⁷⁰ Trade missions of the variety that Hakluyt recorded demonstrate the same awareness of the implications of mortality under the circumstances of long-range journeys where the information gathered before the traveller's demise remained valuable.

Comparison between the strategy set out in the Royal Instructions and the working procedures of the Royal Society suggest a number of points of convergence but also some differences of note. The Royal Instructions show greater awareness of the value of producing botanical and zoological illustrations than many previous works of this kind (a task delegated to

Michaelis (1793), pp. 66 [*recte*: 69], 75.

65. I am grateful to Lawrence Baack for clarifying these complex circumstances. For a reference to the delay in receiving the instructions, see von Haven's letter to Bernstorff 18 January 1763 (Michaelis (1794-1796), Vol. 2, p. 83).

66. The original document, signed by the king and by Bernstorff, was retained by Niebuhr and is now held in the Dithmarscher Landesmuseum, Meldorf, DLM 26000.

67. On the composition of the Royal Instructions see Haslund Hansen (2005), pp. 12-14. In his autobiography Michaelis claimed entire credit for them. Michaelis (1793), p. 67. For Michaelis's already extensive plans for the expedition see his letter to Bernstorff of 30 August 1756 (Michaelis (1794-1796), Vol. 1, pp. 299-324). On 21 October 1760, Bernstorff wrote to Michaelis with enclosures detailing "in extenso" various instructions and suggestions from Professors Kall, Ascanius and Deden, and Kratzenstein (Michaelis (1794-1796), Vol. 1, pp. 445-488). These are provided in Danish translation in Rasmussen (1990) with valuable notes.

68. A precedent for this appears in the Second Kamchatka Expedition, which, unusually, included a group of scientific investigators: a naturalist (Johann Georg Gmelin, replaced in 1737 by Georg Wilhelm Steller); an astronomer (Louis de l'Isle

de la Croyère); and a historian (Müller, replaced in 1740 by Johann Eberhard Fischer). See Bucher (2002).

69. Michaelis (1762), c6v-7r (Royal Instructions §8 and §9).

70. Michaelis (1762), c6v-7r (Royal Instruction §8). Michaelis complained of the failure to observe this advice. Michaelis (1793), p. 75.

Georg Wilhelm Baurenfeind),⁷¹ together with notes on the packing of specimens – a topic that had received consideration, for example, in John Woodward’s *Brief Instructions for making observations in all parts of the world* (1696), presented to the Royal Society. The instructions for the Danish expedition raise an important issue identified by the Royal Society, namely the need for the multiplication of witnesses. Instruction §8 points out that confirming testimonies create greater confidence in the truth of a report.⁷² The same commitment is apparent in a statement by Oldenburg when he printed the “Inquiries for Surat” in 1667. He noted that copies of the document had already been sent to India and that he had received some responses. But he purposely refrained from printing these replies “because ’tis altogether necessary, to have confirmations of the truth of these things from several hands, before they be relied on”.⁷³ Michaelis (as the authority behind the Royal Instructions) embedded the notion of repetition in a much fuller understanding of the potential contribution made by different disciplinary points of view. Yet, while recognizing that specialists could inform one another’s research, he had no expectation of or desire for uniformity and in fact regarded contradiction as a mark of historical accuracy (“historische Treue”).⁷⁴ The Royal Society shared with the Danish expedition an anticipated role for trading companies in effecting their plans. In 1667, Oldenburg remarked on the success of the programme to develop and distribute travel inquiries in the preface to the second volume of the *Philosophical Transactions* and specifically thanked the governors of the Levant and East India Company for their support.⁷⁵ The Danish instructions anticipated a considerable amount of logistical help from the Danish East India Company in transporting goods and samples,⁷⁶ but in fact its involvement proved minimal,

occurring only in 1764 when Niebuhr used the company to ship some materials and specimens (the decision not to base the mission out of Tranquebar played a major role in determining this modest level of participation).

The most notable departure in the Royal Instructions appears in the emphasis on issues of language. Nowhere do we find in the many questionnaires compiled by the Royal Society (or in Boyle’s “General Heads”) any attention to the linguistic conditions of knowledge exchange or a specific role accorded to interpreters and translators. The *Arabian Voyage* foregrounded this issue in a variety of ways. Frederik Christian von Haven and Forsskål were selected in part because they already knew Arabic; along with Niebuhr they were given additional time and support from the crown to improve their knowledge of the language beforehand (with Niebuhr requiring further assistance from them in his studies on board the *Grønland*). Such was the importance attached to this matter that the physician Christian Carl Kramer, appointed only two months prior to the departure of the expedition, had his personal duty to acquire Arabic named in Royal Instructions, again with help from his companions.⁷⁷ This aspect of the *Voyage* arguably gives it a closer connection to the older tradition of the Continental foray where the attainment of proficiency in languages was central to the conception of the purpose of travel.

The attention to travel given by the Royal Society, reflected in its questionnaires and Boyle’s “General Heads”, occurred without advisors giving guidance on the moral deportment of the traveller, a major preoccupation of Humanist advice. The Royal Instructions are much closer to this tradition in a strongly worded statement in section 10 offering guidance on how to relate to Islam in the midst of the journey. The group was told to remain courteous to the inhabitants and to refrain from lodging objections against their religious faith.⁷⁸ Interestingly enough, Cabot made a

71. Michaelis (1762), d4r (Royal Instruction §21).

72. Michaelis (1762), c6v-7r.

73. *Phil. Trans.* 2/23 (1666/7), p. 415.

74. Michaelis (1762), c7r (Royal Instruction §8).

75. *Phil. Trans.* 2 (1667), p. 414.

76. Michaelis (1762), d3v-d4r (Royal Instruction §20).

77. Michaelis (1762), d5r (Royal Instruction §24; see also Royal Instructions §3 and §4 (c5v-c6r)).

78. Michaelis (1762), c7v-c8r. An Amsterdam-based individual

similarly prudential recommendation in 1553, telling his mariners not to disclose their religion to the people they met but rather to “passe over [it] in silence”, and furthermore to “beare with such lawes, and rites, as the place hath, where you shall arrive”.⁷⁹ The advice literature on Continental travel made parallel recommendations for remaining circumspect in the face of confessional differences across Christendom. Even more striking, in terms of governing moral conduct and its connection to the *ars apodemica* tradition, is the stern royal instruction to avoid contact with Arab women, whether by pursuing amorous intrigues or simply taking the kind of liberties tolerated in Europe. The allegedly jealous nature of Muslim men and their tendency to exact revenge necessitated this reminder of moral duty. Interestingly, Michaelis refrained from printing this part of the instruction (its absence is indicated by an ellipsis), perhaps for fear of raising doubts about the probity of the men engaged in the mission, although it did appear in the French translation of 1763.⁸⁰

Despite an energetic commitment to deploying questionnaires, the Royal Society never managed to resolve the problem of creating an obligation to respond to their inquiries (a dilemma also faced by the Hartlib circle’s “Interrogatory”). The Society made attempts to use institutional resources like the Admiralty to enforce responses, but on the whole their ability to solicit answers typically came about from social connections and goodwill – a helpful but still imperfect means of achieving results. In the case of the *Arabian Voyage*, the requirement to respond, emphasized in

the instructions,⁸¹ amounted to a contractual duty rather than a simply moral one. A commissioning authority had the right to impose this on its agents, as we find in the trading companies, although satisfaction was never guaranteed. Of course where the instigator was a sovereign, the demand (and motivation to address it) proved more acute. An important precedent for this exists in the Duke of Saxe-Gotha’s commission of Wansleben’s journey to Egypt a century before.⁸² Likewise the Grand Duke of Tuscany posed questions regarding China for the Jesuit Johann Grueber (printed by Athanasius Kircher in 1670) to which he duly received replies.⁸³

From the point of view of questions and instructions for travel, the centrepiece of the *Arabian Voyage* was Michaelis’s extensive *Fragen*. The enormous interest of this document cannot be adequately explored here;⁸⁴ my purpose is a particular one of placing it in the context of a long set of efforts from the sixteenth to the eighteenth centuries to regulate travel and maximize its impact on knowledge. Michaelis’s preface to the work contains a number of intriguing comments. He begins by citing two defects (*Mängel*) in the practice of travel. The first is an inadequate knowledge of the language of the local country being visited, not only because geography and natural history depend on knowing the names of places and things, but because there is no way to gain insight into the mores, laws, and politics of a people without understanding their language. To reinforce his point he remarks on what would happen if one sent a German to France or England with no knowledge of the native tongue; he remarked laconically that such a person would produce “vortreffliche Gemälde von diesen Völkern” (ex-

named de Navarre wrote to Michaelis on 20 March 1760 with inquiries and included a warning about Muslim zeal.

Michaelis (1794-1796), Vol. 1, p. 432. The first-name initial is indecipherable in the surviving letter. Niedersächsische Staats- und Universitätsbibliothek Göttingen (2^o Cod. Ms. Michaelis 326, fols. 262-265). Navarre responded to a notice of Michaelis’s call in the *Gazette d’Amsterdam* 6 May 1760.

79. Hakluyt (1903-1905), Vol. 2, p. 202.

80. For the part of the instruction missing in Michaelis (1762), c8r, see the French translation, Michaelis (1763), d5v-d6r. For a Danish translation of the relevant passage, see Rasmussen (1990), p. 67.

81. Michaelis (1762), dir-d2r (Royal Instructions §14 and §15).

82. Ernest I’s interest had been piqued by encountering the Ethiopian Abba Gregorius through Ludolf’s contact with him and invitation to visit the court. See Collet (2007), pp. 132-165.

83. “La Briefve & exacte Response du P. Jean Grubere de la Societé de Jesus, a toutes les Questions que luy a fait le Serenissime Grand Duc de Toscane”, in Athanasius Kircher (1670), pp. 316-323.

84. See the extensive and valuable discussion in Hübner (2002), pp. 363-401.

cellent representations of these people).⁸⁵ Clearly Michaelis's professorial role as an exponent of Oriental languages led him to prioritize this issue, but he also signals a relationship to the linguistic emphasis apparent in the long tradition of advice on how to conduct Continental journeys. The second defect is to leave travellers to their own curiosity. In order to make travel useful, supplying them with questions is vital. Otherwise they would pass over various essential things rather than giving them due attention and therefore failing to illuminate a European savant intent on knowing something precise. Ten previous travellers might traverse the country without reporting the very thing required.⁸⁶

In this context Michaelis's assessment of his (shared) role in framing these questions involves a significant change of relationship. He stresses the superior position of the learned originator of inquiries in a way that deserves some comment. For Michaelis, "Dieser [i.e., the learned man] hat Bücher bei der Hand, aus denen kann er vielleicht zehn *data* zusammen suchen, zu denen nur noch das eilfte fehlt, um die Wahrheit zu erfinden." (The learned man has books at hand, from which he can perhaps find ten facts, and only lacks the eleventh to find the truth).⁸⁷ In other words, the educated and informed questioner already has a broader grasp of the terrain of knowledge (based on his reading of books) but requires some points of detail to be supplied. The traveller is thoroughly subordinated to the task of supplying this superior figure with detail in which the balance of power in knowledge terms remains undisturbed. The level of erudition and preparation apparent in Forsskål's correspondence with Michaelis prior to the

journey rather calls this account into question, in his case at least,⁸⁸ but we should note the important point that Michaelis evidently forecloses the possibility that once the expedition had concluded the traveller would have attained a vastly greater level of insight, potentially overturning the schema supplied by existing published sources. This tension in priority is always implicit in the relationship between the producer of questions and the person delegated to answer them. Yet the questions of the Royal Society do not appear to assert the same authority as Michaelis assumes, even if the prestige of the institution and its fellows gave their questionnaires a profile that earned them attention. The hierarchical relationship established by Michaelis may reflect his novel position in providing intellectual leadership for this expedition as a university professor, in an institutional setting where hierarchy was crucial.

Part of Michaelis's confidence stems from a greater degree of coordination in the world of the learned in supplying questions, both locally and internationally. In addition to the input of the Danish savants, Prof. Christian Gottlieb Kratzenstein's connections with Bernstorff had led him to provide valuable "remarks" for the "mathematician" on the journey (Niebuhr) and the "physician" (Forsskål).⁸⁹ In order to sharpen his own questions, Michaelis had assembled a group of learned men in his house.⁹⁰ When these friends provided satisfactory answers to any of the questions he wanted to ask, he omitted the query from his list. This is significant in itself because it declares certain things to be "known" and not in need

85. Michaelis (1762), a4r. In one of the earliest exchanges between Michaelis and Bernstorff about the proposed *Rejse*, Michaelis mentioned the importance of travellers having "eine so gute kenntnis des Arabischen, als in Europa und aus Büchern zu erhalten möglich ist" (to get as good a knowledge of Arabic as is possible in Europe and out of books) to make the most of the journey. Letter of 30 August 1756 (Michaelis (1794-1796), Vol. 1, p. 299).

86. Michaelis (1762), a4v-a5r.

87. Michaelis (1762), a5r.

88. See especially letters by Forsskål of 3 December 1756 and 3 April 1757 (Michaelis (1794-1796), Vol. 1, pp. 333-347). Forsskål demanded the title of professor as a condition of his appointment in his negotiations with Bernstorff, which he was granted (a decision supported by Michaelis (1794-1796), Vol. 1, pp. 391, 398). Von Haven was also given this title, but Niebuhr refused it on the basis of his education.

89. Michaelis (1762), b4r.

90. Michaelis (1762), b5v. He mentions four figures who held professorial positions: Christian Wilhelm Franz Walch, Johann David Heilmann, Johann Georg Röderer, and Christian-Willhelm Büttner.

either of further investigation or repetition of observation. However, in the absence of an example from Michaelis we cannot tell what kinds of questions he eliminated on this basis.

Michaelis anticipated the possibility that his *Fragen* might contain errors (*Fehlritte*), precisely because his questions related to more than one scientific discipline and might overextend his reach. He clearly had his European audience in mind and the potential for sacrificing his reputation (either by making mistakes or asking about things that one ought to know). In his defence he adopted a more humble profile by saying that errors are simply unavoidable. As for knowing the books which might have rectified any slips before they entered the questionnaire, no one had time to read them all. Furthermore, he admitted that answers to some of his questions (presumably of a natural historical variety) would be available by consulting cabinets of curiosity assembled in Europe, but access to them was not always readily available.⁹¹ He circulated his questions openly through publication, enlisting into the project a wider constituency composed of different representatives within the learned world.

Two further points raised by Michaelis in the preface clarify our sense of how he understands the strategy behind the document. The first is bound to strike the reader his *Fragen*, as indeed in many other cases of extensive questionnaires: how realistic was it to expect adequate answers? Michaelis explained that the friends who assisted him expressed this very concern. They wondered whether the vast number questions he posed would exceed the capacities of five researchers on a three-year expedition; if the number of questions in the text were counted not according to the headings but by the subjects covered in each of the “articles” then they amounted to more than a thousand.⁹² Gaining certitude about the matters covered by them was really too much to expect, nor did previous attempts to organize responses by travellers inspire confidence in the prospects of success. In reply

91. Michaelis (1762), b5r.

92. Michaelis (1762), b6v.

Michaelis merely stated that he anticipated learning more by asking a thousand questions than he would by asking a hundred.⁹³ As for the travelling party itself, their skill made him hopeful.

The final related point he makes in connection with this issue is that his questions are intended to serve as a guide not merely for the travellers commissioned by Frederik V but for others engaged in journeys to the same territories. The questions that the five members were unable to resolve would merit the attention of future “Gelehrte[n] oder Kaufleute” (scholars or merchants).⁹⁴ Fig. 2 shows evidence of one contemporary reader of the text making a digest of the questions in the flyleaf of his copy, with a view, it would seem, to following up on them. By using various networks of contacts, the intention of the *Fragen* was to elicit a coordinated response, one that could aspire to comprehensiveness and overcome the limitations of the specific journey that occasioned them. In this sense the document is intended to be exemplary, and its purpose in entering print recalls Hakluyt’s decision to reproduce instructions for particular journeys, some of which ended in total failure, precisely because future expeditions might address the shortcomings of earlier undertakings.⁹⁵

The actual questions posed by Michaelis address an array of topics, from topography to astronomy, social custom, and natural history. In this sense they embrace the diversity of subjects and scope that appears in the general advice of Varenius, Boyle, or Meier. The specificity of what Michaelis asks about, the question form itself, and the sources that prompted the questions have more in common with the Royal Society’s questionnaires for different countries and territories. In particular, Michaelis indicates the reading that led to him to seek more information, a practice he shared with the Royal Society.

93. Michaelis (1762), b7r.

94. Michaelis (1762), c1r.

95. See, e.g., Hakluyt (1903-1905), Vol. 7, pp. 253-254; 410-411. See also the elder Richard Hakluyt’s instructions for Sir Humphrey Gilbert and Martin Frobisher, discussed in Carey (2009), pp. 174-175.

For example, Michaelis's seventh question asks about reports of swarms of flies described in various travel accounts of Egypt, and whether they are true or exaggerated. His sources here, as he indicates, are Pliny and Hiob Ludolf.⁹⁶ Question twenty-four asks for further attention to what modern travellers have to say about the pestilent wind called the *Samum* (he cites Engelbert Kaempfer, Jean Chardin, and Alexander Russell's *Natural History of Aleppo* (1756)).⁹⁷ We have already seen that in the case of the Royal Society's inquiries for Egypt, the compiler (Henshaw) advertised his indebtedness to Pierre Belon and Dioscorus Siculus in compiling his questions. In Oldenburg's prefatory remarks to a new batch of inquiries for the Antilles and Caribbean islands he stated that they were "collected out of the Relations of several Authors writing of those Islands", such as Charles de Rochefort's *Histoire des Isles Antilles de l'Amérique* and Richard Ligon's *A True and Exact History of the Island of Barbados*. Similarly, the inquiries for Surat were taken from "the Relations publisht by Purchas, Linschoten, and others".⁹⁸

Of course the overwhelming interest that drove Michaelis was to illuminate Biblical history – not that this excluded attention to natural history. In fact the two were deeply intertwined. For instance, question 12 asked about the reference in the Old Testament to leprosy of house and garments (Leviticus 14:33-57) and whether this was more than a metaphor. Question 18 wanted to know if a wood existed which turned salt water to sweet, spoken of in Exodus 15:23. Elsewhere he combined ancient and modern sources. In relation to the kinds of manna in Arabia he referenced the sixteenth-century Augsburg naturalist Leonard Rauwolf who travelled in the Middle East, as well as the Mosaic description of nourishment on Arabian manna reported in Exodus.⁹⁹ The Bible may have been the origin of questions but this did not preclude

use of complementary accounts, either with a direct link to the territory (as in Rauwolf) or without one, such as his citation of William Hillary's *Observations on the Changes of the Air and the Concomitant Epidemical Diseases, in the Island of Barbados* (1759) for information on leprosy.¹⁰⁰

Although we can locate certain points of contact between Michaelis and the Royal Society's approach to asking questions, significant differences remain. The first of these is that Michaelis often indicated *why* he was asking a question. This might seem an obvious thing to do but should not be ignored. The Royal Society's questions (and indeed those of other questionnaires) typically neglect this side of the equation. Sometimes we can work out intuitively the reason for asking a question; in other cases one would like to know what kind of assumptions about nature prompted them, or whether the questioner asked because they either doubted or believed in the existence of something. More importantly, Michaelis often provides conjectures and hypotheses on the topics he wants investigated (in the form of essays) which do the work of explanation. In one respect this entailed a significant departure from the Royal Society's method which, following Bacon, favoured an inductive accumulation of data rather than indulgence in hypothesis. In another respect, Michaelis cast himself in a role paralleling the Baconian "Interpreter": he would integrate and pronounce on findings, while his emissaries confined themselves to a lower-order activity. He was clear that he required of them not "Vermuthungen" (conjectures) (in which scholars abounded) but rather merely "facta".¹⁰¹ Whatever way the labour was divided, Michaelis's approach had the effect of turning the Bible into a kind of travel account requiring further investigation. Yet it is worth pointing out a salient difference between the Bible and travel books like those used by the Royal Society to extract their inquiries – non-confirmation of some aspect of natural history recorded in Scripture would not disqualify the text from being invested with belief.

96. Michaelis (1762), pp. 15-16.

97. Michaelis (1762), pp. 44-47.

98. *Phil. Trans.* 2 (1666/7), p. 415.

99. Michaelis (1762), pp. 24-25, 36, 51. On Rauwolf see, recently, Walter (2009).

100. Michaelis (1762), 60-69.

101. Michaelis (1762), p. 169.

The *Arabian Voyage* synthesized a history of prior experience in directing travel to useful ends by commissioning individuals for the journey and equipping them with instructions and questions. The maturing of a practice apparent in this enterprise appears not only in the sophistication and care with which these were developed but also in the coordination of the effort. Michaelis may have been the driving force, using his prestige to advance the enterprise, but he contributed to a composite effort and appealed to a community of like-minded scholars and learned men, equally intent on capturing the potential of travel to illuminate questions of shared interest. As Michael Legaspi has recently described him, “Michaelis was a *Macher*, a first-rate intellectual entrepreneur.”¹⁰² The process he led was collaborative, optimistic to the point of being utopian, and like all such efforts, inevitably incomplete.

Some of these conclusions are borne out by following the afterlife of Michaelis’s questionnaire once it appeared in German and in French translation. On the one hand we see the spread of networks in a way that Michaelis welcomed through the contacts of his contacts. For example, the French physician François Thiéry, with whom he corresponded, wrote to say he had made rapid inroads in distribution, sending the translation to Madrid, making it known in Paris, and anticipating circulation among consuls in the Levant.¹⁰³ Michaelis’s friend, the Scottish physician Sir John Pringle, was particularly assiduous, writing on several occasions to indicate individuals to whom he had given the work, which he curiously referred to as “Inquiries for the Danish missionaries”.¹⁰⁴ Pringle

mentioned that he was unable to get a copy of the work to the Scottish traveller James Bruce, who was already in Egypt and on his way to Abyssinia, but he did devise some questions to provide him with.¹⁰⁵ The connection with Pringle draws attention to the importance of the Anglo-Hanoverian Personal Union as a further setting for Michaelis’s activities in this context, which included his own visit to the Royal Society and Pringle’s journey (in the company of Benjamin Franklin) to Göttingen.¹⁰⁶

On the other hand, we also see in the exchanges a tendency of questions to breed questions, and for answers, where they were forthcoming, likewise to raise more questions.¹⁰⁷ Michaelis had encouraged this process from the start but it did not end with the publication of his *Fragen*.¹⁰⁸ Posing an inquiry implied the possibility of an answer and therefore the prospect of finality on any given topic, but this was in practice difficult to attain. An inevitable disappointment came into play because the answers were either not forthcoming or failed to fulfil expectations. Pringle expressed disappointment that his own efforts to secure responses had been unavailing and later wrote to lament the delay in the publication of the “answers to your ingenious questions”.¹⁰⁹ Niebuhr did however communicate a 20-page a response in Latin to the

102. Legaspi (2010), p. 81.

103. Letter of 18 August 1763, in Michaelis (1794-1796), Vol. 2, pp. 96-97. Thiéry (who occasionally acted as physician to Rousseau) spent the period of 1759-62 in Spain. In advance of the Arabian journey, Thiéry’s questions on smallpox were given to the physician Christian Carl Kramer (Royal Instruction §25). Thiéry’s *Observations de Physique et de Médecine, Faites en Différens Lieux de l’Espagne*, 2 vols (Paris, 1791) included discussion of smallpox.

104. On Pringle’s contacts, see Michaelis (1794-1796), Vol. 2, pp. 212-213, 217, 223-224, 238. On his reference to the travellers as missionaries, see Michaelis (1794-1796), Vol. 2, pp. 220, 223.

For details of Pringle’s distinguished medical career (he was also president of the Royal Society 1772-78) see Blair (2004).

105. Letter of 2 June 1769, in Michaelis (1794-1796), Vol. 2, pp. 223-225.

106. See Biskup (2007), pp. 140, 144-148. In 1768, Bishop Thomas Percy wrote to Michaelis asking if he could supply a gathering missing from the copy of the French translation of the *Fragen* obtained for him at the Frankfurt Book Fair by the Duchess of Northumberland. Hecht (1933), p. 3.

107. For an early attempt by Forsskål (writing from Constantinople in September 1761) to answer certain questions and Michaelis’s reply in February 1762 with commentary and seeking more information, see Michaelis (1794-1796), Vol. 2, pp. 31-38; 56-60.

108. See, e.g. the lengthy letter from Thiéry of 18 August 1763, in Michaelis (1794-1796), Vol. 2, esp. pp. 99-112.

109. Letter of 2 June 1769, in Michaelis (1794-1796), Vol. 2, p. 224; letter of 23 March 1772, in Michaelis (1794-1796), Vol. 2, p. 321.

questions of the *Académie Royale des Inscriptions et Belles-Lettres* in September 1768, not long after his return, which survives, although it remained unpublished.¹¹⁰ Michaelis remarked on the fate of the project in his autobiography, published in 1793 after his death, noting the difficulty caused by losing all but one of the participants in the journey. Niebuhr had done more than one could expect under the circumstances, but the fact remained that Michaelis had designed many of his questions for von Haven and Forsskål. Michaelis was forced to conclude that the demise of Niebuhr's companions had "die Frucht der Reise vermindert" (reduced the fruit of the journey). Reflecting on this setback Michaelis responded in a characteristic spirit: "Also der Nutzen meiner Fragen fiel zum Theil weg, und sie können vielleicht, fünfzig von Reisenden noch besser beantwortet werden" (so the benefit of my questions partly disappeared, and they can perhaps be answered better by fifty travellers).¹¹¹ For advocates of scientific travel, the remedy was to ask more questions, distribute them more widely, identify additional respondents, and insist on their giving replies.

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110. Bibliothèque Nationale de France NAF 6196. On the discussion this provoked, see Detalle (2003), pp. 4-5. For a translation of Niebuhr's response regarding religion in the Yemen, see Detalle and Detalle (2008), pp. 494-497. See also the paper by Detalle and Detalle in this volume.

111. Michaelis (1793), pp. 74, 75.

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