

Chapter 1

From Parish to Nation

Thomas Pennant on Tour

After visiting Joseph Banks at his home in New Burlington Street, London, in May 1768, the Reverend Gilbert White wrote to the Welsh naturalist Thomas Pennant. White commented that “even Mr Banks (notwithstanding that he was soon to leave the kingdom, & undertake his immense voyage) afforded me some hours of his conversation at his new house, where I met Dr. Solander.”¹ White’s visit is representative of the standard practice of leaving a local parish to converse with other naturalists and view collections, examples being the specimens Banks had collected in Newfoundland, while discussions centred on Banks’s preparations for traveling to the South Pacific.

Travel was integral when undertaking natural historical research in Britain itself. Expeditions ranged from local parochial surveys resulting in publications such as White’s *Natural History and Antiquities of Selborne* (1789) through to broader national journeys. Examples include Pennant’s tour of Scotland in 1769 and voyage to the Hebrides in 1772. Journeys to survey the natural history of Britain were undertaken by a wide range of genteel naturalists; examples include Gilbert White, Joseph Banks, Thomas Pennant, Anna Blackburne, Benjamin Stillingfleet, William Borlase, Alexander Catcott, Thomas Falconer, Hugh Davies, Henry Jenner, and others. Given the quantity of individuals who traveled within Britain and the numerous archival resources they produced, this chapter analyzes the journeys taken by Pennant, White, and Banks, naturalists who traveled to observe, collect, and record specimens. These naturalists encountered objects when researching a specific area, during national expeditions and when visiting private natural history collections compiled during

international voyages. This resulted in the emergence of works that ranged from parochial accounts through to global natural histories.

The main analysis explores the development of naturalists' use of paper alongside different scales of time, classificatory systems, and the geopolitical areas they covered. The initial concentration is on the integration of paper into natural history research practices, exploring how this was formulated and presented to facilitate the processes of recording and collecting information over different periods of time and geographical scales. This progresses to an analysis of approaches to collecting information on natural history research trips that covered specific geographical areas. Local trips to the same places were repeated over several decades and naturalists rarely carried large quantities of books and collecting equipment on these expeditions.

Through building on smaller-scale collecting enterprises naturalists started to embark on more extensive national journeys, which include the two tours of Scotland Pennant commenced in 1769 and 1772. National trips often took several months, required considerable preparation, and show how Pennant communicated with local populations in the Outer Hebrides in addition to working and traveling with a team of fellow naturalists, field assistants, and a train of porters who carried the equipment. This casts new light on contemporary understandings of indigeneity within Britain, showing how naturalists who traveled in remote areas collected information on the native flora and fauna while working with local peoples who communicated in several different languages. The notion of "indigenous" became increasingly common in accounts of British natural history in the late eighteenth century, a prominent example being Colin Milne and Alexander Gordon's *Indigenous Botany*, published in 1793. This has certain correlations with Alix Cooper's exploration of local collecting in early modern Europe, arguing that Carl Linnaeus's systematic innovations initiated important changes in local natural histories.² The final section examines how natural historians undertook global research during journeys across Britain, by traveling to the increasingly diverse collections owned by other naturalists and the menageries and art collections of the aristocracy. These collections were used to produce accounts Pennant referred to as "general" natural histories designed to encompass a global array of flora and fauna, emphasizing the connections between national travels and naturalists' interests in the wider world.³

Interest in natural history grew throughout the eighteenth century, often inspired by the rulers of emergent European nation-states who sought to centralize administrative structures and catalogue the resources of specific regions. Individual catalogues accommodated different geographical scales and often concentrated on specific areas to consolidate regional power and assess their economic value. In Britain the state was far less centralized than the administration of absolutist states in Continental Europe, although geographical scale and the economic importance of specific areas were of particular importance to British landowning elites when it came to the management and general improvement of their property.

The decentralized administration and increased importance of specific areas shaped the natural history enterprises administered by Pennant, Banks, and White, all of whom had economic and political interests in improving the regions they studied. Geographical scale and personal interests molded the nature of expeditions, naturalists' approaches to recording information, and their main outputs of correspondence and publications. In Britain natural history books published since the 1760s tended to take the form of parochial, county, and national natural histories and floras. Localized accounts compared records of species with those compiled in other parishes, nations, and on global expeditions. The concept of Great Britain as a "nation" was still new during this period. Wales had been unified with England since 1536, Scotland since 1707, and Ireland was not incorporated into a political union until 1801. The British Isles became more politically distinct from the Continent after the 1750s due to frequent wars, which resulted in the construction and definition of a maritime border alongside the solidification of internal administrative units. The defined nation-state inspired naturalists to conduct research on particular areas and compare these with potential rivals.⁴

The geographical scales British naturalists worked across were determined by internal boundaries that solidified administrative entities. Each constituent country was divided into counties under the jurisdiction of a sheriff, who answered to the monarch and central government. Counties consisted of parishes, usually defined as an area administered by a member of the clergy under the jurisdiction of the Church of England. From the 1750s, these political and religious administrative entities became more geographically distinct, developing into important units of official administration that often

defined the parameters of an area used by natural historians for their research. By 1800 parishes emerged as essential administrative and social units toward which individuals developed significant personal connections.⁵ As a result of landlord absenteeism, the local clergy often became the most important people in the parish. The very nature of their work, of traveling through the parish to converse with and record the births, marriages, and deaths of parishioners, gave them an insight into more general paper-based recordkeeping practices and—if so inclined—the opportunity to pursue work on the natural history of their surroundings.⁶

The Emergence of Traveling “Paper Technologies”

Practices of recordkeeping on the natural world had to be adapted to a range of different information sources, physical localities in which they were used, and movement between geographical areas, ranging from surveys of specific areas taking place over decades to more general accounts covering larger geographical distances over shorter periods of time. From the late seventeenth century, it became a routine practice for naturalists and antiquarians to assemble paper in a variety of different formats for use on expeditions. These included notebooks, separate bound volumes that contained specific information pertaining to a single expedition, geographical region, or kingdom of nature; annotated printed books, often compiled from octavo and duodecimo volumes that were frequently interleaved with blank pages so information could be incorporated into a system of classification; and loose notes that could be reordered, added to, inserted between the pages of books, and posted back to a naturalist’s home after new information was acquired. Many of these practices adhered to a programme set out by Francis Bacon and promoted by the Royal Society of London, which encouraged the systematic recording of empirical facts in journals and commonplace books that could be collated at a later date.⁷

Examples include the emergence of natural histories defined by a specific county or constituent kingdom pioneered by figures such as Robert Plot, who wrote accounts of Staffordshire and Oxfordshire, and Edward Lhuyd’s work on Wales.⁸ Naturalists held the Baconian belief that information gathering depended on “the united labours of many,” collaborating with groups ranging from local people to employed assistants while consistently comparing these views with published works and their own observations to construct detailed records

that allowed this information to be received and adapted by different people. As Staffan Müller-Wille has suggested, these Baconian ideas inspired Linnaeus's own approaches to developing technologies of writing and classification of the sciences.⁹ A product of the popularity of Baconian philosophy and the Linnaean system for certain branches of natural history, these two aspects led to the emergence of a variety of different collecting practices used by naturalists throughout Britain, which led to the emergence of systems designed to exchange and compare vast quantities of information.

Thomas Pennant's interests emerged from within this tradition, collaborating across cultures to assimilate information recorded in a variety of diverse paper repositories. For example, Pennant described how he "kept a regular journal," which took a similar form to a traditional commonplace book, on his expeditions around Britain, which he wanted to remain unpublished "as they contain inaccuracies." However, Pennant's journals were made available to the select group who visited his private library at Downing Hall "as they contain many descriptions of buildings, and accounts of places in the state they were at the time they were made."¹⁰ These processes of collecting information and visiting collections were all governed by strict social hierarchies between traveling gentlemen-naturalists, the staff they employed, traveling companions, and those they encountered on the expedition. One legacy of the seventeenth century that becomes clear throughout Pennant's working practices is his annotation of printed books. Many of the annotated books Pennant used as he traveled were printed in the seventeenth century. Examples include copies of Francis Willoughby and John Ray's *Ornithology* (1678) and Christopher Merrett's *Pinax rerum naturalium Britannicarum* (1667). The annotations Pennant added to these volumes are designed to locate species he observed and collected within a prescribed systematic order, standardizing information as it moved between Pennant's own field notes, illustrations correspondence, and printed text. For example, in his copy of Merrett, Pennant inscribed on the front flyleaf "such as are found in Flintshire I have marked thus —," adding a dash to the margin next to the description of every species found in this specific geographical area to compare this distribution with the more generalist survey.¹¹ This reflects on how Pennant consistently integrated information when formulating his zoological works and travel accounts, adding and extending entries in printed books.

Paper, in a variety of different formats, became increasingly available from the 1760s with the general expansion of paper production and printing. This allowed naturalists to complexify their different means for recording information, using interleaved books, almanacs, instruction manuals, and ledgers, objects designed to be carried in pockets and encased in wallet-style bindings to protect them from hostile weather conditions.¹² These books became central for unifying times and dates across the country and were used by naturalists such as Banks, White, and Pennant, who incorporated them into their wider systems for managing information.

Natural Histories of the County and Parish

The mid-eighteenth century saw an increase of natural histories defined by a county or parish, studies that served as an intricate jigsaw puzzle to be slotted together by naturalists who aspired to national projects. For example, when gathering detailed information on an entire country, Thomas Pennant circulated questionnaires titled “Queries, addressed to the Gentlemen and Clergy of North-Britain, respecting the Antiquities and Natural history of their respective Parishes, with a view of exciting than to favour the World with a fuller more satisfactory account of their Country, than it is the Power of a Stranger and the transient Visitant to give.”¹³ These questionnaires indicate the necessity of parochial knowledge for a broader survey, showing how localized accounts could fit within a national framework. Pennant’s questionnaire, which contained twenty-five questions relating to natural history, was inspired by his correspondence with William Borlase (1696–1772), who circulated questionnaires to every parish in Cornwall when compiling information for his *Natural History of Cornwall* (1758). Borlase was motivated by a long tradition of circulating questionnaires established in the seventeenth century by figures such as Edward Lhwyd, Robert Plot, Gerard Boate, and Robert Boyle, who used the Royal Society’s journal, *Philosophical Transactions*, to distribute lists of questions titled “Articles of Inquiries Touching Mines” and “Other Inquiries Concerning Sea.” Many early questionnaires remained general and did not seek to extract geographically specific information. The early eighteenth century saw the emergence of surveys of counties such as Leicestershire, Rutland, Norfolk, Dorset, Oxfordshire, Staffordshire, County Down, Durham, and others. Pennant’s questionnaires were circulated with

the hope that “parochial *Geniuses* will arise and favour the Publick with what is much wanted, LOCAL HISTORIES.”¹⁴

Pennant intended to inspire similar working practices to those he used to record the natural history of specific areas. For example, when collecting information for his *Of London*, Pennant described: “I often walked around several parts of London, with my notebook in hand, that I could not help forming considerable collections of materials.”¹⁵ These new projects inspired lengthy correspondences on particular geographical areas, some of which Pennant published. One typical example is Charles Cordiner’s *Antiquities & Scenery of the North of Scotland* (1780). After realizing that he would not be able to explore the northernmost parts of Britain in any detail, Pennant financed Cordiner’s research and publication. Similarly, at the recommendation of Banks, Pennant engaged the Reverend George Low of Birsa to explore and produce a manuscript on the Orkney and Shetland Islands. Although this manuscript remained unpublished until 1813, Pennant integrated Low’s observations into his manuscripts and publications.¹⁶ Pennant’s patronage of figures such as Low and Cordiner shows how he emerged as a significant supporter for parochial natural histories.

Perhaps the most famous parochial natural history is Gilbert White’s *Natural History and Antiquities of Selborne* (1789), a book compiled from detailed surveys of a specific area repeated over several decades. In compiling these records, White relied on his copies of Daines Barrington’s *Naturalist’s Journal* (1767) and his garden *Kalendar*, books used to record the gradual changes that occurred in specific places. White often went beyond the traditional scope of garden and natural history records, adding a wealth of detail on the seasonal changes to specific species, their interactions with one another, and supplementary information on wider global events. White’s interests in the wider world reflects the numerous conversations he had in London. In addition to visiting Banks, he conversed with Pennant and Barrington, whose correspondence reveals their integration with a global network ranging from those who reported sighting James Cook’s ships off Kamchatka Peninsula in the late 1770s through to the American Revolutionary War and an explanation for the delays in printing “[Gilbert] White’s letters on swallows” in the Royal Society’s *Philosophical Transactions*.¹⁷ White hoped that *Selborne* would encourage “stationary men” to “pay some attention to the districts in which

they reside,” forming a model that could be followed by those creating parochial accounts across the country.¹⁸

To produce surveys defined by the natural borders of a single county or parish, naturalists combined their own observations with information recorded in printed books with a wide geographical outlook. Naturalists saw the improvement of specific local areas, which often included a substantial proportion of their own landholdings, as particularly important to their work and personal connections to regional politics. For example, Banks held the position of sheriff of Lincolnshire from 1792 to 1793, Pennant served as high sheriff of Flintshire from 1762 to 1763, and White was responsible for the spiritual well-being of the parishioners in Selborne. As parishes grew in prominence, many began to play a greater role in supplying poor relief and maintaining common land, much of which was removed to fulfill ideas of national improvement after the passing of successive Enclosure Acts in 1769 and 1773.¹⁹ The parish, as an increasingly significant focal point, gave a greater call for naturalists to undertake surveys of these areas, many of which did not have specific works of natural history associated with them.

County natural histories by figures such as Robert Plot and John Morton remained the most geographically specific natural history books of the seventeenth century. In addition to the emergence of general inventories of counties, the late seventeenth century saw systematic works that concentrated on a specific aspect of the flora or fauna of the entire globe, such as Francis Willoughby and John Ray’s *Ornithology* (1678) and Ray’s *Historia Plantarum* (1686–1704).²⁰ From the 1750s, the combination of the Linnaean reform and the solidification of national political boundaries in Europe stimulated the emergence of national floras and faunas that conveyed lists of a single kingdom of nature from a specific geopolitical area, giving a sense of uniqueness and topographical limits to a population. As Janet Browne has suggested, the construction of Linnaean national floras and faunas in Britain tended to follow the examples set by Linnaeus’s apostles in the 1740s and 1750s. By the 1780s there was a full range of works available on the open market that represented the flora or fauna of different nations. Typical examples included John Hill’s *Flora Britannica* (1760), Johann Georg Gmelin’s *Flora Sibirica* (1747), Georg Christian Oeder’s *Flora Danica* (1766–1789), and John Lightfoot’s *Flora Scotica* (1777).²¹

Geographical specialization influenced naturalists' means for using books on research trips that presented global inventories of a single branch of nature. Books were used to identify and associate certain species with a specific area, connecting these regions with the wider world whilst emphasising their uniqueness. For example, Pennant commented that to undertake his zoological work, he combined information "from the works of general naturalists, from the Fauna of different countries, and from my own observations."²² An example of a "general" book is Pennant's copy of Willoughby and Ray's *Ornithology* (1678). This gave Pennant "a great love for natural history in general" from the age of twelve when he received a copy from his uncle, John Salisbury. In his working copy of *Ornithology*, Pennant added annotations that relate to species he observed and collected in his local county of Flintshire. On the first endpaper Pennant wrote, "N. B. The Birds marked thus * are found in Flintshire."²³ This symbol has been added next to every entry in this work that concerns a species Pennant found in his local county. Pennant traveled throughout Flintshire to observe birds, some of which he viewed in the grounds of Downing Hall, where his library overlooked a drive, extensive grass lawn, and wooded area. Pennant and his son, David, both encouraged birds to come near to the house. The regular purchase of "Seed for the Birds to Downing" is recorded in their 1803–1807 household account book.²⁴

A species Pennant observed and collected in Flintshire was the bittern, as is apparent from an annotation in his copy of Willoughby and Ray's *Ornithology* (figure 1.1). The close observation of the bittern allowed Pennant to build on Willoughby and Ray's description, giving additional information on its anatomy, weight, geographical distribution, character, and calls. In *British Zoology*, Pennant described the bittern as "a very retired bird, concealing itself in the midst of reeds and rushes in marshy places."²⁵ This was an improvement on Ray's brief description, which only described its call and nesting habits, and fulfilled Pennant's ideal of conducting fieldwork that aligned with the model initiated by Willoughby and Ray a century before: "In the prosecution of our plan, we shall to avoid the perplexity arising from forming a new system, adopt (as far as relates to the *Quadrupeds* and *Birds*) that of the inestimable Ray, who advanced the study of nature far beyond all that went before him."²⁶

Pennant believed his detailed descriptions in *British Zoology*

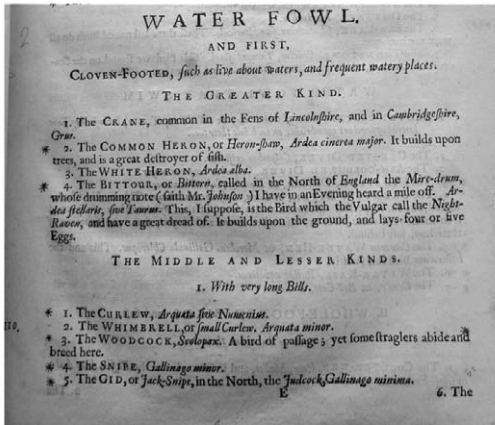


FIGURE 1.1. Left: page 15 from Thomas Pennant’s copy of Francis Willoughby and John Ray’s *Ornithology* (1678). By permission of Llyfrgell Genedlaethol Cymru/The National Library of Wales. Right: Pennant’s specimen of a bittern that he used to formulate the description for *British Zoology*. © Jonathan Jackson, Natural History Museum, London.

would prove useful for others with interests in the natural history of their local parishes. This is apparent from the various parochial users of Pennant’s *British Zoology* (1776–1777). For example, John Blackburne of Orford Hall, near Warrington, used his copy to record species he observed in Orford, inscribing, “Those marked with the letters a. b. are in my Collection. 1800. J. Blackburne.” Blackburne recorded details of the birds he shot and added to the collection originally compiled by his sister, Anna Blackburne, whose name is undoubtedly represented by the “A. B.” initials. The Kingfisher is representative of a new addition to the collection that Blackburne recorded as being “Shot at Orford Janury. 18th 1803” (figure 1.2).²⁷ Similarly, White used his copy of *British Zoology* to record observations of choughs in Sussex and the nesting habits of sand martins.²⁸ Pennant’s *British Zoology* became an essential resource for naturalists when surveying local

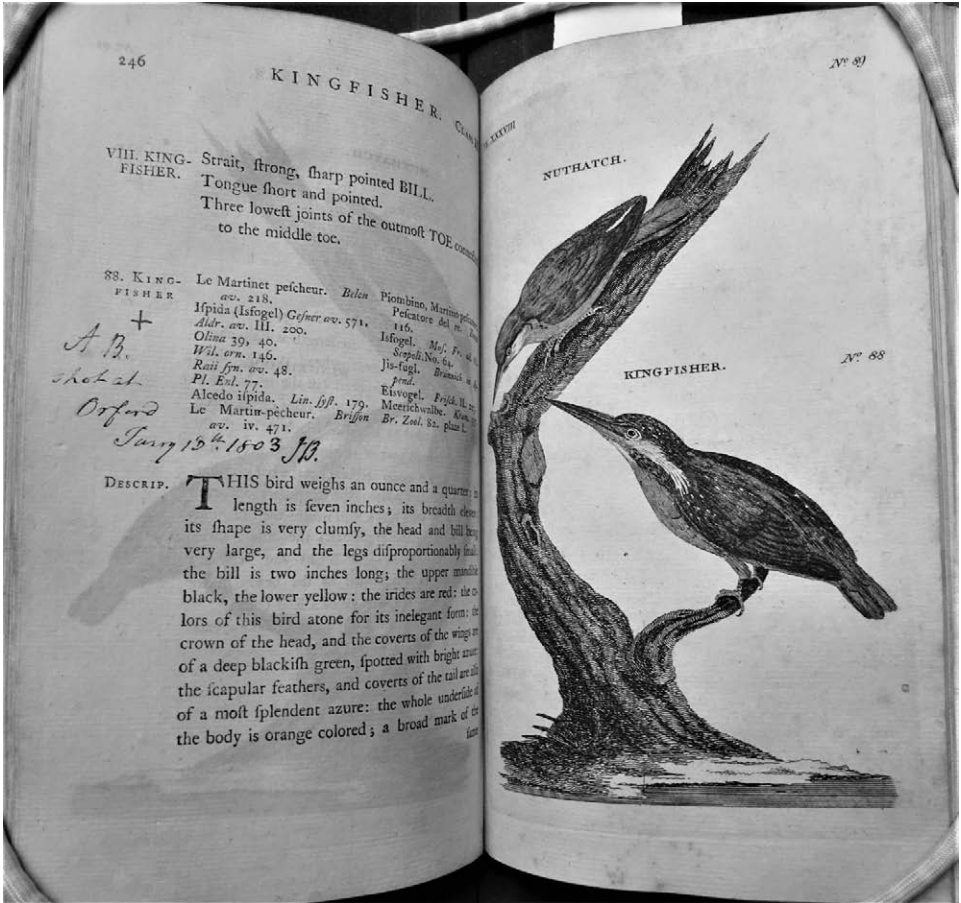


FIGURE 1.2. Annotations next to the description of the kingfisher in John Blackburne’s copy of Thomas Pennant’s *British Zoology* (1776–1777). By kind permission of the Trustees of the Natural History Museum, London.

parishes, who then communicated their observations to Pennant, who was compiling a new edition.

The use of national natural histories to identify and account for species in a specific area is apparent from Pennant’s and White’s use of national floras to produce inventories of plants that could be found in their local parishes. For example, in his copy of William Hudson’s *Flora Anglica* (1762), White inscribed, “The Plants marked thus × have all been found within the parish of Selborne in the County of Southampton,” marking a total of 439 species (figure 1.3).²⁹ Similarly, in his copy of John Lightfoot’s *Flora Scotica* (1777), Pennant noted

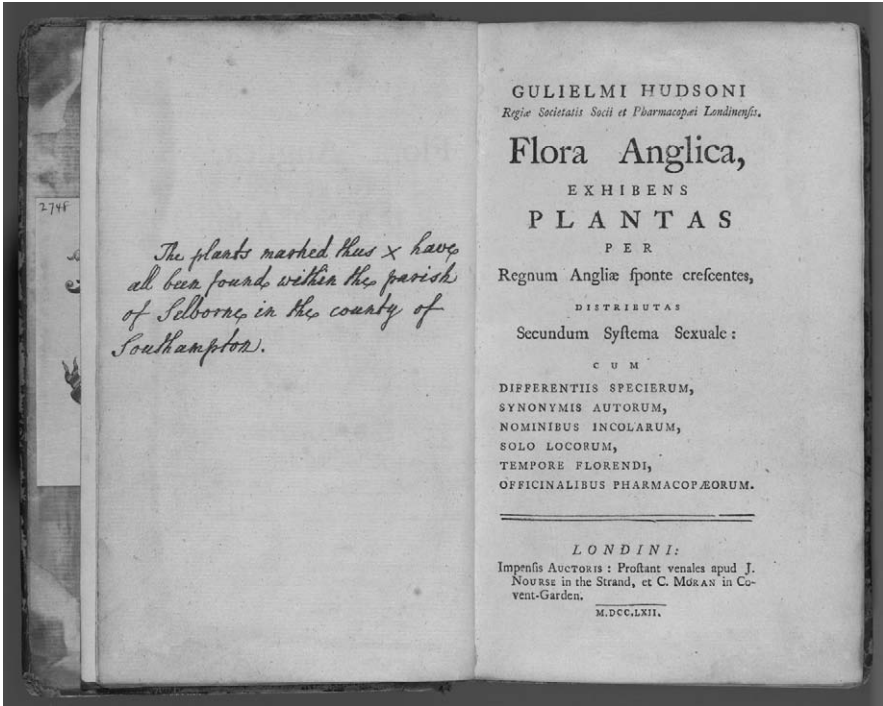


FIGURE 1.3. Gilbert White's annotated copy of William Hudson's *Flora Anglica* (1762). Houghton Library, Harvard University.

that all the species he marked with “+ [are] In whiteford parish.”³⁰ These national botanical works were crucial for identifying and isolating the flora of a specific area while arranging it according to the Linnaean system. This practice allowed naturalists to integrate species observed in a specific place with a broader program, comparing specific areas to develop a national picture. For example, marginal notes were used by Pennant and White to construct publications on their local parishes. In his *History of the Parishes of Whiteford and Holywell* (1796), Pennant listed plants found in the parish and ordered these according to the Linnaean system. Many were collected and identified by Lightfoot, who had visited Downing Hall when touring Wales in 1773.³¹ White also published an inventory of the botanical species he encountered in Selborne, providing descriptions of the local conditions responsible for the high diversity of species in the parish.³² All of these plants are ordered and named according to the synonyms given in Hudson's *Flora Anglica*.

Annotated natural history books recorded and codified species from a specific area, structuring these under a definitive system of classification to follow the Baconian ideal of collecting, stabilizing, and ordering empirical factual information. For Pennant and White, the system they used depended on the branch of natural history. For plants, fish, shells, and insects, they preferred the Linnaean system. For quadrupeds and birds, they leaned toward the system used by Ray. For example, White's annotations in his copy of Ray's *Synopsis Methodica Avium & Piscium* (1713) relate the printed descriptions to his observations of specific ornithological species in Selborne and specimens communicated by his brother, John White (1727–1780), from Gibraltar.³³ Similarly, Hudson's *Flora Anglica* was central to White's approach for using the Linnaean system when assessing the diversity of species in Selborne. These small books could be carried inside a coat pocket or satchel and would be taken on frequent parochial or even countywide expeditions. Many were adapted to accommodate notes. Examples include Thomas Martyn's copy of *Methodus Plantarum circa Cantabrigiam Nascentium* (1727). Martyn annotated his interleaved copy with additional notes on the species mentioned in the printed text that he observed during his travels around Cambridge.³⁴

Annotations and descriptions in printed books were often associated with loose pieces of paper to aid with the incorporation and accessibility of information. For example, White kept small folded over sheets of paper alongside his copy of Ray's *Synopsis Methodica Stripium Britannicarum* (1724).³⁵ The Oxford botany professor Johann Jacob Dillenius (1684–1747), whom White had met during his time at the university, had edited this book, and it remained an essential tool for White's research before it was superseded by Hudson's *Flora Anglica*. White's supplementary notes were used alongside his copy of Dillenius's edition of Ray's work and provide an index for the main classificatory divisions that allowed him to locate specific sections, speeding up the process of identifying species in the field. Although White suggested that "to enumerate all the plants that have been discovered within our limits would be a needless work," he emulated Pennant by marking every species he observed within the natural parochial boundaries of Selborne in *Flora Anglica*. This facilitated the comparison of similar records kept by naturalists across the country who kept annotated copies of *Flora Anglica*, including Richard Pulteney, James Edward Smith, and Humphrey Sibthorp.³⁶

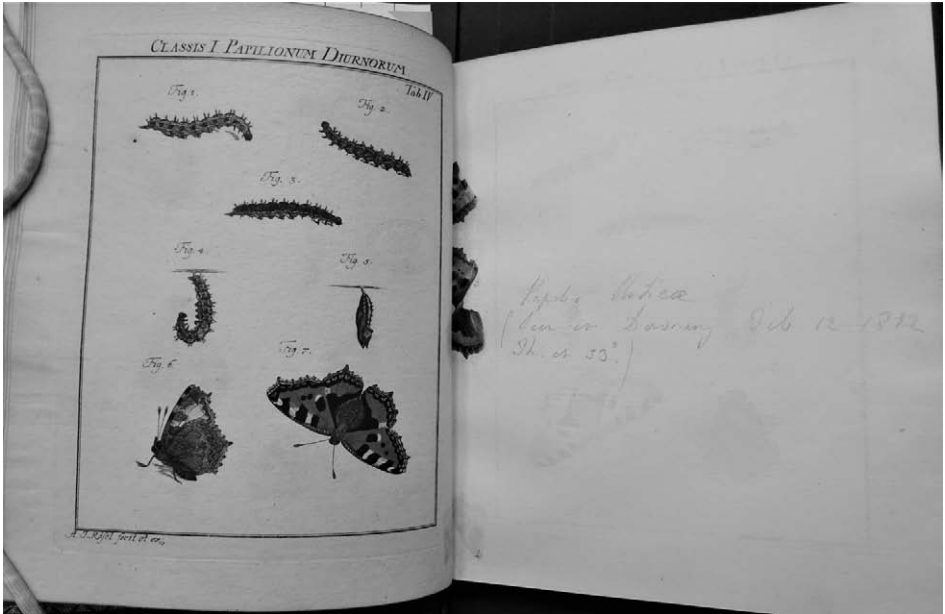


FIGURE 1.4. The image, specimen, and annotation on the interleaved page in the hand of David Pennant in the Downing Hall copy of August Johann Rösel von Rosenhof’s *Insecten-Belustigung* (1746–1761). By kind permission of the Trustees of the Natural History Museum, London.

Sometimes naturalists employed pre-Linnaean publications to record local observations and classify species according to the Linnaean system. For example, Pennant’s copy of August Johann Rösel von Rosenhof’s *Insecten-Belustigung* (1746–1761) was interleaved with blank pages designed for annotation.³⁷ Compiled from a series of copperplate images that display the metamorphoses of insects, this work is characteristic of what Pennant described as a “general” natural history that aimed to create a global inventory of entomological species. The interleaved pages in Pennant’s copy have been annotated by his son, David, who also added specimens and watercolor images that describe and depict insects he collected in the local parish. For example, on February 12, 1812, David Pennant caught a small tortoiseshell butterfly at Downing Hall. He then took this specimen back to the library and pressed it between the pages of Rösel’s work. Pennant used the interleaved page to note the Linnaean binomial, referring it to *Systema Naturae*, adding the local temperature, the time it was collected, and the original locality (figure 1.4).³⁸

Pennant's meticulous recording of the temperature and date show the close relationships between practices of recording natural history, the weather, and atmosphere by the early nineteenth century. The annotations in Pennant's copy of Rösels serve to unify these two sets of observations, locating them in a specific time and place, situating localized observations within a global insect classification. Simultaneous observations of the local weather and natural history were central for connecting a specific area with a broader national picture. For example, between 1780 and 1835, David Pennant kept daily weather readings at Downing Hall. Following a similar format to the tables of annual weather reports published in *Philosophical Transactions*, his notebooks show that he checked the weather two or three times each day, noting the date, hour, minute, and temperature, taking readings from a thermometer, barometer, and weather vane.³⁹ His notebook has a white parchment wallet-style binding to protect the paper interior from the weather—for David Pennant would have to go outside to take readings from various instruments, record the direction of the wind, and assess the quantity of rain, taking a very similar structure and purpose to the notebooks used by Thomas Barker (1722–1809), brother-in-law to Gilbert White, who kept meticulous weather records from his home at Lyndon Hall, Rutland, between 1738 and 1798.⁴⁰ David Pennant's use of different instruments reflects how they permeated into wealthy households with the general expansion of luxury consumer goods.⁴¹ Instruments imposed standard measures on the unpredictable North Wales weather, readings recorded in notebooks, and interleaved books designed to standardize information on local flora and fauna and the weather that governed it.

Interconnected approaches to recording the weather and natural history was essential for applying structure to nature, allowing for the accurate prediction of the annual life cycles of certain species. For example, next to the weather records for March 13 and 14, 1793, David Pennant added a description of how the plants "Ficaria verna has been in flower some days; on the same walks I saw the anemone memorosa, & by the pond a tuft of the Caltha palustris." Pennant's records of the cyclical and seasonal changes species went through in his immediate locality are similar to those White added to the *Naturalist's Journal*. White placed his descriptions of the natural world alongside momentous political events, descriptions that quickly spilled over the edges of the printed forms. In comparison, Pennant's notebook gave

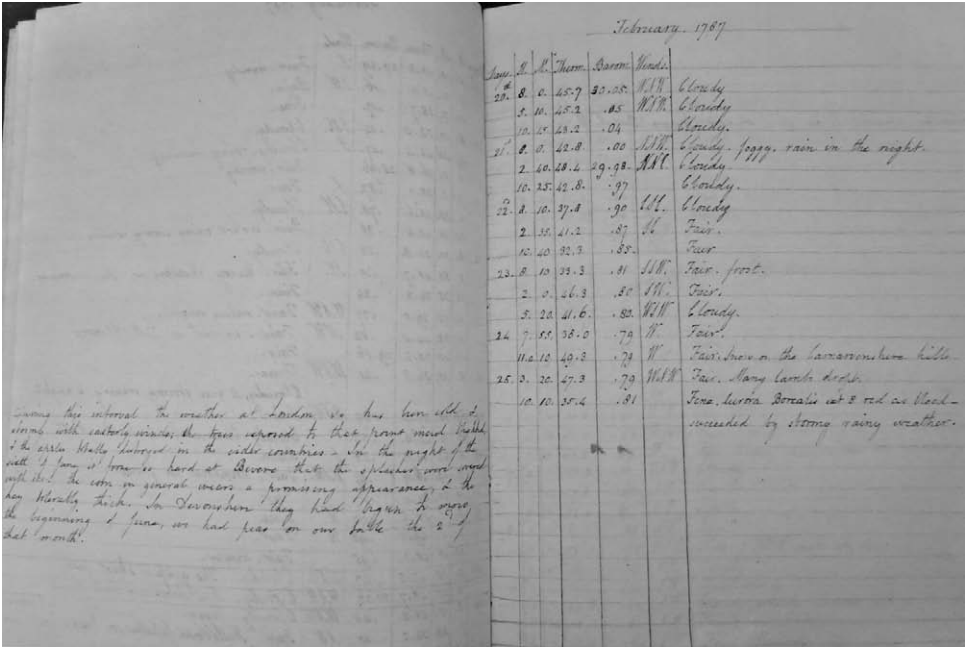


FIGURE 1.5. David Pennant’s weather records and related observations for the end of February 1787. By permission of Llyfrgell Genedlaethol Cymru/The National Library of Wales.

him the flexibility to relate information on local events to news circulated throughout the wider nation. This came in the form of letters, newspapers, and visitors to Downing Hall. For example, on February 25, 1787, Pennant described seeing aurora borealis “red as blood” at Downing Hall and added information on more general events from across the country on the blank left-hand page of the notebook (figure 1.5). These include the “cold & stormy” weather in London, the impact of this on apple trees in the cider-producing counties of the Midlands, and its effects on the harvest in Devonshire.⁴²

The relationship between parochial records, national natural-historical, and political events was essential for inspiring collaborations between naturalists. Examples include that between White and Daines Barrington, whose handwriting appears throughout several copies of the *Naturalist’s Journal* from White’s collection. Barrington often added information that relates White’s specific observations of Selborne to a broader national picture.⁴³ These notes relate to Barrington’s interest in creating “a General Natural History of Great

Britain,” which was to result from the combination of “many such journals kept in different parts of the kingdom.”⁴⁴ Barrington and Pennant had similar reasons for distributing the *Naturalist’s Journal* and questionnaires: to become overarching patrons of parochial natural histories as exemplified by the central role of their correspondence in White’s *Selborne*. However, the joining up of parochial accounts only went part of the way toward creating national natural histories and many believed more extensive travel was required to lend authority to these accounts.

Collecting on a National Expedition

In comparison to journeys around local counties and parishes, longer expeditions naturalists took to survey major constituent parts of Britain, such as Scotland, Wales, and Ireland, required more preparation. By the 1760s, Thomas Pennant was regarded as a main authority on the natural history of these regions. The geographical extent of Pennant’s journeys, or “tours,” had a significant impact on his approach to recording and ordering information on the natural history of constituent kingdoms. The main purpose of these trips was to survey, observe, describe, collect, and enumerate species from around Britain, thereby giving Pennant licence to write an expanded edition of *British Zoology* published between 1776 and 1777—the page count of this edition is more than double that of the edition published between 1768 and 1770. Providing a numerical analysis was of great importance to Pennant, who stated that an “enumeration of the species of certain classes of the animal kingdom would be equally agreeable and serviceable to the travelling Zoologist.”⁴⁵ Many contemporaries reaffirmed Pennant’s qualification to study Britain in its entirety. For example, in a letter to his brother, John, Gilbert White remarked that Pennant “has now taken great pains to investigate Great Britain and its Islands, and will be well qualified to put the last hand to the ‘British Zoology’ in a quarto edition.” In *The Scientific Tourist through England, Wales, Scotland* (1818), Thomas Walford commented that “those tours that come from the pens of scientific travellers are not only most pleasing, but always the most instructive,” identifying Pennant as a known authority and reprinting the itineraries of his national “tours.”⁴⁶

Pennant traveled on two main tours of Scotland in 1769 and 1772. The latter included a voyage to the Hebrides. Pennant’s second journey was the most extensive and he allowed John Lightfoot,

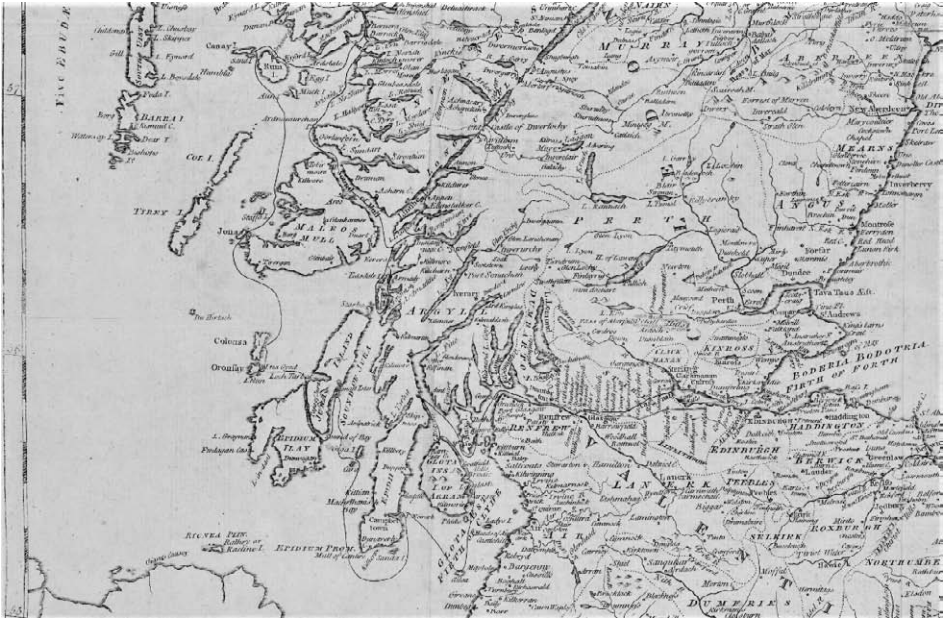


FIGURE 1.6. Detail from Thomas Pennant’s map of Scotland (1774). The black line around the islands marks the route of Pennant’s voyage in 1772. Reproduced by kind permission of the Trustees of the National Library of Scotland.

the Linnaean botanist and curator of Margaret Bentinck, the Duchess of Portland’s private natural history collection, to accompany his party. This planned trip was inspired by Joseph Banks’s voyage to the Pacific aboard the *Endeavour*, Pennant’s previous tour of Scotland in 1769, and his *Tour on the Continent* in 1765. Pennant either traveled on horseback or paid for passage on postal coaches during overland trips. For example, after his visit to George-Louis Leclerc, Comte de Buffon’s (1707–1788) estate at Montbard, Pennant described how “M. de Buffon lent me horses to convey me to the nearest post . . . took the post horses at Maison neuves.”⁴⁷ Pennant privately chartered ships to commence sea voyages. Examples include the cutter *Lady Frederick Campbell*, which Pennant boarded in Glasgow on June 17, 1772, and traveled on when surveying the Hebrides (figure 1.6). In addition to Lightfoot, Pennant was accompanied by staff, including Archibald Thompson, the ship’s master; Dr. John Stuart of Luss, a Gaelic expert and Linnaean botanist; Moses Griffith, an artist; Louis Gold, a French valet; an unnamed landscape painter; a groom; and a hawker.⁴⁸ The expenses Pennant incurred from this “journey and

voyage from May 18th to my return [in] sept.r.” totalled £296, a sum he offset against sales of the published account of his *Tour in Scotland*.⁴⁹ Pennant’s large team presents a very different mode of travel when compared to others who visited this region. For example, when writing about Samuel Johnson’s 1773 tour, James Boswell wrote, “Dr J thought it unnecessary to put himself to the additional expense of bringing with him Francis Barber, his faithful black servant; so we were attended only by my man, Joseph Ritter, a Bohemian; a fine stately fellow above six feet high, who had been over a great part of Europe and spoke many languages.”⁵⁰ This reflects on their very different outlooks on funding these tours. For example, Pennant made clear that he only ever intended to break even on his expenses through sales of his published work. By contrast, Johnson relied on profiting from the published account for his income.

The structures of authority Pennant established with fellow travelers resemble the workings of his country estate at Downing Hall. Most of those who accompanied Pennant were employed and treated as servants. For example, Pennant described the artist Moses Griffith, who lived in a cottage on Pennant’s estate for over thirty years, as having “distinguished himself as a good and faithful servant, and able artist.” During the tours and Griffith’s early career, Pennant regarded the latter’s artistic capabilities as his personal property, describing how “in the spring of this year [1769] I acquired that treasure, Moses Griffith,” who was “descended from very poor parents.” Similarly, Pennant described his valet Louis Gold as a “servant and friend,” reflecting their good relationship for much of Pennant’s life.⁵¹

Pennant utilized the talents of his servants as trained amanuenses and artists, employing these skills alongside more general tasks associated with cooking, cleaning, and carrying baggage. The hierarchies and practices employed on Pennant’s tours were nearly all established in his library, where Griffith, several secretaries, and family members had specific defined roles in the process of managing and recording incoming information, reflecting the hierarchic structure of the Downing estate. Each stage of Pennant’s information-management system utilized the skills of an individual and defined their specific assigned role, practices later transposed onto the materials and people that accompanied Pennant on his tours.⁵² Other figures who accompanied Pennant, such as Lightfoot, received similar treatment to the honored guests who visited Downing. As a result, Pennant allowed his guests

to employ the skills of his natural history staff and servants, although he continued to maintain authority over the use of this material in publications.

Pennant exercised his private wealth to employ the crew of the *Lady Frederick Campbell* for the purpose of surveying the natural history and topography of the Hebrides, thus reducing the potential for conflicts between Pennant's party and the seamen, and they parted on good terms. Pennant noted how Thompson's "obliging conduct throughout, and skill in his profession, demand my warmest acknowledgements."⁵³ This is very different from the relationship between many other traveling naturalists and their employers. For example, in 1778 the Earl of Sandwich described Johann Reinhold Forster, who had traveled on James Cook's second voyage of exploration, as "a person who could not keep a friend for any length of time, his behaviour to me, who did my utmost to serve him, was a plain proof of the truth of this affliction."⁵⁴ Daines Barrington requested Pennant "to continue silent with regard to matters between myself and Dr: Forster leaving that ungrateful madman to me as I shall know how to deal with him."⁵⁵ Barrington's and the Earl of Sandwich's comments reflect on the frequent conflicts between the naval administration, captains, and naturalists on ships chartered by the government where natural history remained a secondary concern—a difference in opinion that caused Banks to back out of Cook's second voyage.⁵⁶

However, Pennant's and Thompson's relationship was not without disputes. On July 11, 1772, when the *Lady Frederik Campbell* was approaching the Isle of Staffa, the rough weather compromised the ship's safety. Thompson refused Pennant's request to dock at the island. Staffa was a recent discovery for naturalists of the late eighteenth century, and Banks formulated the first account of the island after visiting on his way through the Hebrides to Iceland on August 12 and 13, 1772. Pennant was interested in the geological formation of the tall hexagonal basaltic columns and wished for the ship to approach the rocky foreshore of the island, commenting that "I wished to make a nearer approach, but the prudence of Mr. *Thompson*, who was unwilling to venture in these rocky seas, prevented my farther search of this wondrous isle: I could do no more than cause an accurate view to be taken of its Eastern side, and those of the other picturesque islands then in sight."⁵⁷ Rather than producing his own account, Pennant relied on that provided by Banks whose artist, John Clevelley

(1747–1786), had produced an illustration of Fingal’s Cave. A large cave formed from basaltic columns, Pennant reproduced Cleverley’s image in his *Tour in Scotland and Voyage to the Hebrides, 1772* (1774).⁵⁸

Although Pennant was dismayed at not being able to land, he regarded the publication of Banks’s description of Staffa to be “a great consolation,” allowing him to “lay before the public a most accurate account.”⁵⁹ Pennant was reassured by his fellow traveler John Stuart, who suggested shortly after the voyage that “I think it does not hitherto appear that Mr. Banks has made any new considerable discoveries in his late voyage. As for the Island of Staffa, by passing near it on a fine day I doubt not but you had as good an opportunity of observing the general appearance of it’s curious columnar rocks as he could have had by landing there.”⁶⁰ Despite Stuart’s comments, the inclusion of Banks’s account emphasizes the collaborative nature of this book. As the editions progressed, Pennant added dozens of descriptions concerning various Scottish regions communicated by correspondents and respondents to questionnaires in a voluminous appendix.

The specific roles assigned to those who accompanied Pennant on his 1772 tour of Scotland mirrors the collaborative nature of the main published products of this journey. Lightfoot was responsible for botanical matters since Pennant had “quit all thoughts of Botany” by 1767.⁶¹ Pennant regarded Lightfoot as having equal social status, similar to Samuel Johnson and James Boswell, who traveled through the Hebrides in 1773, and used Lightfoot’s notes for his botanical descriptions in *A Tour in Scotland and Voyage to the Hebrides*. Pennant also intended for Lightfoot to publish *Flora Scotica*, to which he contributed an introduction on Scottish zoology.

A major difference between the workings of the library at Downing and hierarchies exhibited on Pennant’s tour was the employment of Stuart for his combination of botanical knowledge and expertise in the Gaelic or Erse language. Stuart acted as a translator for Pennant and his companions in rural areas. Pennant remarked in the preface to his *Tour in Scotland* that he was indebted to Stuart “for a variety of hints, relating to customs of the natives of the highlands, and of the islands, which by reason of my ignorance of the *Erse* or *Galic* language, must have escaped my notice.”⁶² Lightfoot thanked Stuart for “a great portion of *Highland* botany, for *many* of the *medical* and *oeconomical*, and all the *superstitious* uses of plants” in addition to “the supply of their *Erse* and *Gaulic* names.”⁶³ Stuart was essential for providing

Pennant and Lightfoot with Erse plant and animal names, which they placed alongside the Latin and English descriptions in *Flora Scotica* (1777), *A Tour in Scotland and Voyage to the Hebrides* (1774), and *British Zoology* (1776–1777). He was also used to translating and publishing information on the Erse language, publishing a revised version of the Gaelic Bible in 1767. Stuart's knowledge of the economic potential of species and his ability to translate Erse plant names into Latin and English was indispensable when Pennant and Lightfoot came to formulate descriptions of species, combining information on Indigenous uses with their systematic accounts.

Pennant and Lightfoot followed Linnaean practices when integrating Indigenous names and uses for new botanical species into Latin names and diagnoses, providing clues in the binomial name or generic description that could lead the reader to Indigenous Scottish uses of a species while reducing synonymy.⁶⁴ The desire to understand the original etymological root followed a long tradition that had been common among British naturalists since the seventeenth century. Naturalists such as Ray frequently recorded the vernacular names in books such as *Historia Plantarum* and compiled works based on local names, terms, and sayings, such as *A Collection of English Proverbs* (1670).⁶⁵ As Alix Cooper has suggested, interests in making local floras bilingual or even trilingual was a means for moving beyond groups of classically educated scholars to integrate knowledge from local communities into botanical collecting.⁶⁶ Thus, Pennant's interests in aligning Indigenous British names, contemporary English names, and those ascribed by Linnaeus were central for placing these species in their historical context and allowed him to improve on earlier descriptions.

Pennant made efforts to obtain Indigenous names for plants and animals during his travels around Britain and devised paper tools to record this information. For example, when it came to England and Wales, Pennant published lists of Indigenous names at the end of *British Zoology*. These were sourced from the people he visited, correspondents, and his team of field assistants. Pennant obtained the majority of "British" names, derived from the Welsh language, from William Morris of Anglesey.⁶⁷ The process of accumulating these multilingual lists can be found in the loose papers Pennant tipped into his copy of Willoughby and Ray's *Ornithology*, which Pennant and Morris used to tabulate comparisons of "English," "British," and the "Translation

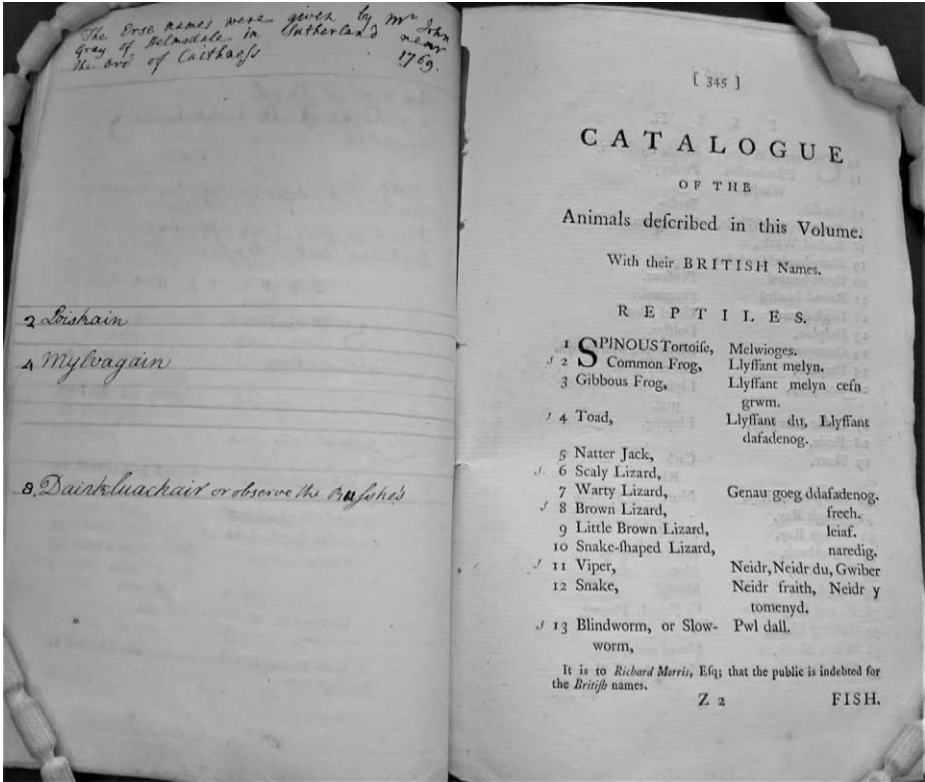


FIGURE 1.7. Thomas Pennant’s interleaved copy of a “Catalogue of the Animals Described in This Volume with their British Names” extracted from the third volume of *British Zoology* (1769). By permission of Llyfrgell Genedlaethol Cymru/The National Library of Wales.

of the British” names, the last column being in Morris’s hand representing their collaborative working practice.⁶⁸ To collect Indigenous names on his broader national journeys to Scotland, Pennant had the printed appendices of English and Welsh names for quadrupeds, birds, and fish from the 1768–1770 edition of *British Zoology* interleaved and bound as a separate notebook.⁶⁹ Pennant and the people he encountered then annotated the interleaved pages during his trip. Some annotators added Erse names and keyed these to the number in the printed text (figure 1.7).⁷⁰ This practice of using numbers to align printed descriptions and annotations on interleaved pages compares with Johann Reinhold Forster’s use of an interleaved copy of *A Catalogue of British Insects* (1770). As Staffan Müller-Wille has suggested, Forster produced this work to supplement Pennant’s *British Zoology*

and added the names of species he acquired or observed since the publication of the book to the blank pages. Pennant carried his notebook-style indices on his journey to Scotland in 1769, during which he sourced Erse names from a “Mr. John Gray of Helmesdale in Sutherland near the ord of Caithness.” Pennant stopped in Helmsdale on his way to Duncansby Head at the northeastern corner of the Scottish mainland.⁷¹ The unification of the English, Welsh, and Erse languages in this interleaved pocketbook embodies Pennant’s wish to unite the three major languages of Britain, giving him enough information to produce a national natural history. Knowledge of different vernacular names for species throughout England, Scotland, and Wales was central for the creation of a national account that assessed the economic potential for species, and, in a similar manner to a Linnaean binomial, offered a roadmap to any Indigenous uses. The physical status of the light, flexible, interleaved book shows how paper facilitated the collaborative accumulation of information. Not only did Pennant and his team of amanuenses use this book, but it could be lent to people he met on the journey so they could contribute their own knowledge of the Erse language and local fauna.

During his 1772 voyage through the Hebrides aboard the *Lady Frederick Campbell*, Pennant ensured that he had several notebooks, interleaved books, and printed volumes at his disposal. Some of these he brought from Downing Hall; others were obtained from stationers in various Scottish towns. By the late eighteenth century, stationers had become more widespread in remote areas and it was even possible to purchase supplies in the islands of the Hebrides. For example, Samuel Johnson, who traveled throughout the Hebrides with James Boswell in 1773, noted that when “Mr. Boswell’s journal was filled” he purchased some paper from the one standing shop on the island of Col.⁷² As Mary Poovey has suggested, Johnson viewed the emergence of shops and the ability to purchase supplies for writing as part of a chain of material conditions that facilitated knowledge production and the collection of information.⁷³ The increased connections between remote rural areas and the cities of southern Scotland after the Jacobite Rising of 1745 facilitated detailed studies of these regions and their integration into a centralizing nation-state.

During the Hebridean voyage, Thompson acquiesced with the majority of Pennant’s requests, defining the relationship Pennant established with his employees to enable his survey of the natural history

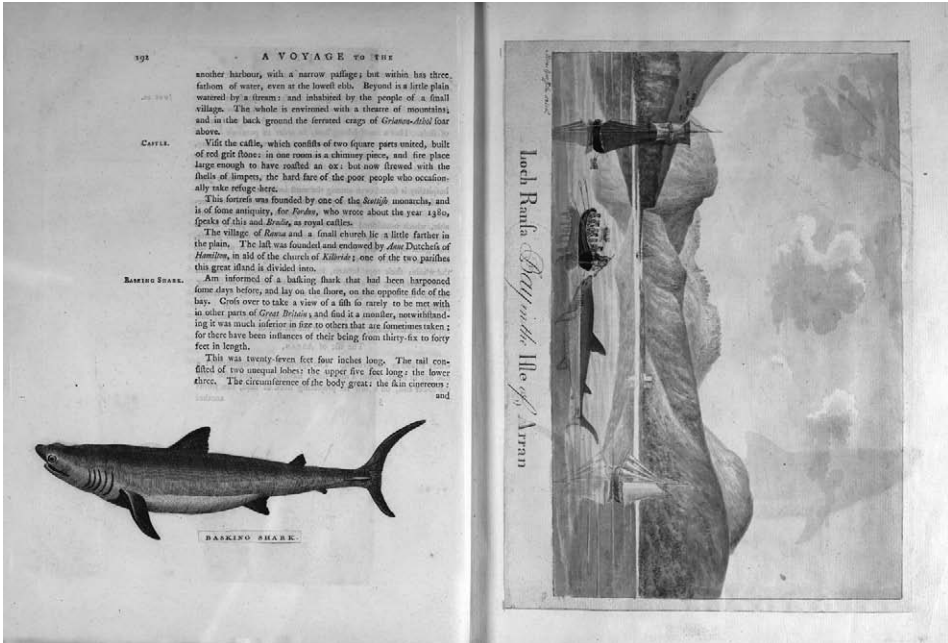


FIGURE 1.8. Thomas Pennant's extra-illustrated copy of *A Tour in Scotland and Voyage to the Hebrides* (1790) showing Moses Griffith's illustration of the capture of a basking shark in Loch Ranza. Mounted under Pennant's description is the related print from *British Zoology*, vol. 3 (1776). By permission of Llyfrgell Genedlaethol Cymru/The National Library of Wales.

of the Western Isles. This becomes apparent from the use of the ship for natural historical pursuits. An example can be found in Pennant's descriptions and Moses Griffith's illustrations of the basking shark, a species they observed at Loch Ranza on the Isle of Arran on June 20, 1770.⁷⁴ When Pennant visited this site he commented that basking sharks "were so tame as to suffer themselves to be stroked" from the boat, and Griffith produced a pen and ink wash image that shows a cutter, possibly the *Lady Frederick Campbell*, in close proximity to a crew from another ship who are represented as attempting to harpoon the shark in a method similar to that described by Pennant (figure 1.8).⁷⁵ In *British Zoology* (1776–1777) and his *Tour in Scotland and Voyage to the Hebrides*, Pennant commented that he observed living and dead specimens of the basking shark: "They will permit a boat to follow them, without accelerating their motion, till it comes almost within contact; when a harpooner strikes his weapon into them as

near to the gills as possible.”⁷⁶ Pennant’s authority to make such statements is most likely a product of his ability to instruct Thompson to sail with pursuits of natural history in mind, approaching such creatures as the *Lady Frederick Campbell* navigated the Hebrides, observations he then combined with the accounts he obtained from local clergy such as “Mr. Lindsay the minister,” who led him on a journey overland from Ranza in June 1772.⁷⁷

Pennant’s interest in carrying out detailed observations of the basking shark reflects its perceived economic potential. In *British Zoology*, Pennant described “the measurements of one, I found dead on the shore of *Loch Ranza* in the isle of *Arran*” equating for its size, weight, and fin shape while describing its use in the local economy. Pennant observed how the liver was boiled in kettles to extract oil, adding that “a large fish will yield eight barrels of oil; and two of worthless sediment.”⁷⁸ This precise description is essential for classifying the shark according to the system laid down by Linnaeus in *Systema Naturae*, which was based on the fin ray count, taking the number, size, and position of the dorsal, anal, pectoral, and tail fins into account before moving onto more general physical characters such as size. Unlike quadrupeds and birds, Pennant believed the Linnaean system provided the best means for describing and classifying fish, commenting, “I should be very disingenuous, if I did own my obligations in this respect to the works of ARTEDI, DE GRONOVIVS, and LINNÆUS.”⁷⁹ A copy of the engraving of the basking shark from *British Zoology* has been pasted under the description in Pennant’s copy of his *Tour in Scotland and Voyage to the Hebrides*, showing the close relationship between these two sets of descriptions and images.⁸⁰ In this way, Pennant extrapolated different sorts of information from his field notes and tailored these to specific works. Material on the events that transpired when hunting the basking shark and the romantic backdrop of Loch Ranza were set aside for his *Tour in Scotland and Voyage to the Hebrides*, and the systematic description was reserved for *British Zoology*.

Another product of the collaborative practices employed on this voyage was Lightfoot’s *Flora Scotica*. Pennant funded this book and wrote the introduction on Scottish zoology to give a general overview of the interactions between plants and animals. Pennant’s financial outlay for *Flora Scotica* was made clear in a letter Lightfoot sent on October 21, 1777: “I am sorry you gave yourself the trouble to particularise your Expenses in the Publication of the *Fl: Scotica*. I hear

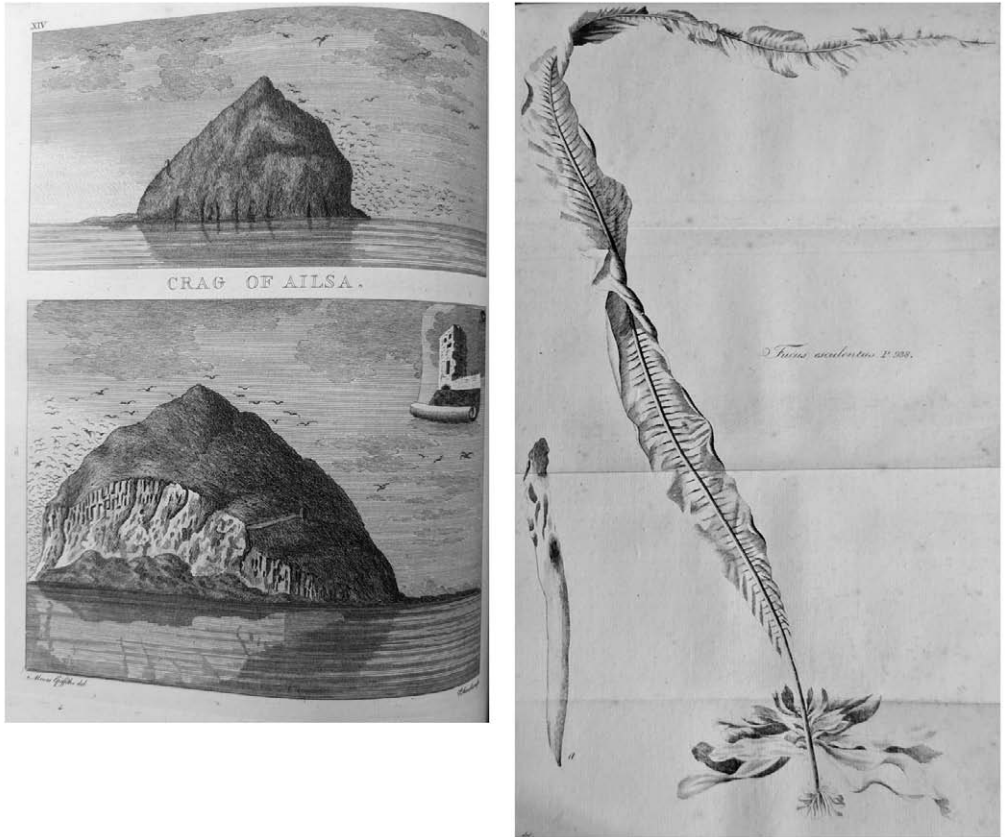


FIGURE 1.9. Left: an image of the Crag of Ailsa from Thomas Pennant’s *A Tour in Scotland and Voyage to the Hebrides* (1774). Private collection. Right: the copperplate image of *Fucus esculentus* from John Lightfoot’s *Flora Scotica* (1777). By kind permission of the Trustees of the Natural History Museum, London.

they must be great. But if the Public should intertain as favourable an opinion of the Work as you are pleased to do, I hope you will be repaid with interest.”⁸¹ Pennant’s bill for the for the publication expenses of *Flora Scotica* was a colossal £471/10/2. In perspective, this cost considerably more than Pennant’s entire journey, at £296, a sum that equated to the value of a considerable landholding. Pennant added publication expenses to the “expenses on Mr. Lightfoot’s acct. in the voyage,” which totalled £30/0/1.⁸²

Pennant’s *A Tour in Scotland and Voyage to the Hebrides* and Lightfoot’s *Flora Scotica* are connected through descriptions of species and

geographical localities. One locality is the Crag of Ailsa (now referred to as Ailsa Craig), a bleak inhospitable rock at the mouth of the Firth of Clyde approximately ten miles off the western coast of Scotland, which they visited on June 25, 1772. Whilst on the island, Moses Griffith produced two illustrations. One depicts a species Lightfoot ascribed the name *Fucus esculentus* in *Flora Scotica*. The other shows the Crag of Ailsa and was published in Pennant's *A Tour in Scotland and Voyage to the Hebrides* (1774) (figure 1.9). Lightfoot described how "we gathered it [*Fucus esculentus*] at Ailsa Craig, on the western shore."⁸³ In his *Tour in Scotland and Voyage to the Hebrides*, Pennant described the Crag of Ailsa as "a perpendicular rock of an amazing height, but from the edges of the precipice, the mountain assumes a pyramidal form: the whole circumference of the base is two miles."⁸⁴ Pennant's and Lightfoot's descriptions of the Crag of Ailsa emphasize the collaborative interlinked process of collecting information and compiling these books. Griffith's images show how Pennant shared Griffith's artistic skills with Lightfoot to complement their simultaneous natural history programs.

In comparison to Lightfoot, who concentrated on producing a systematic survey of the botany of Scotland, Pennant was interested in the zoology of the Crag of Ailsa. This is emphasized by the prominence of the sea birds in Griffith's image and the time and space Pennant gave to describing the spatial distribution of each species: "The birds that nestle on the precipices are numerous as swarms of bees; and not unlike them in their flight to and from the crag. On the verge of the precipice dwell the gannets and shags. Beneath are guillemots, and the razor bills; and under them the grey bills and kittiwakes, helped by their cry to full the chorus. The puffins made themselves burroughs above: the sea pies found a scanty place for their eggs near the base."⁸⁵ These observations reflect Pennant's interest in local animal populations, observing an integrated community of different species that all inhabited a range of climates over a specific geographical area. This observational approach was essential for classifying birds according to Ray's system that relied on the preferred habitats and social interactions between species.

The listing of species present in a small, but diverse, geographical locality reflects Pennant's desire to chart the differentiation between them and emphasize "everything I thought would be of service to the country."⁸⁶ For the Crag of Ailsa, Pennant described the "people who

come here to take the young gannets for the table and other birds for their feathers," an industry that earned the Earl of Cassilis an annual rental income of £33. The contemporary and historical economic value of species is apparent throughout Pennant's *British Zoology*. In the appendix to volume 2, Pennant even provided a published account of the financial costs of species caught for the dining table in the early sixteenth century, combining his interests in natural history, the economic potential of species, and the historical value of nature.⁸⁷

The ability to convert diverse information into a numerical account was essential for connecting a national natural history of Britain to similar enterprises undertaken across Europe and the globe. Approaches to creating what Pennant described as a "general" natural history became more intertwined with biogeographical research by the close of the eighteenth century and became dependant on comparing the distribution of species across broad geographical areas.⁸⁸ For example, Pennant's combination of accounts communicated by correspondents allowed him to map the flora of Britain. In his *Supplement to the Arctic Zoology* (1787), Pennant stated:

In about *lat.* 53, I may draw a line from the *North Sea* to the opposite part of the kingdom, which will comprehend a small part of the north of *Norfolk*, the greater part of *Lincolnshire*, *Nottinghamshire*, *Derbyshire*, the moor-lands of *Staffordshire*, all *Cheshire*, *Denbighshire*, *Flintshire*, *Caernarvonshire*, and *Anglesey*. Beyond this line nature hath allotted to the northern part of these kingdoms certain plants, of which I am about to make an enumeration, which are rarely or never found to transgress that line to the south. Those which are nearest the south shall be first taken notice of.⁸⁹

Pennant's mapping of British plants was facilitated by the solidification of internal boundaries, which allowed him to piece together information sourced from specific parishes and counties to give an overall national picture. The process of enumerating species diversity becomes apparent from the notes Pennant tipped into his copy of Lightfoot's *Flora Scotica* where he recorded the total numbers of species found in each constituent country. For example, when it came to zoology, Pennant noted the presence of forty-one species of quadrupeds in England, thirty-seven in Scotland, and sixteen on the Orkney and Shetland Islands. At the end of his listing of birds and plants from Scotland and Orkney, Pennant added that "the enumeration of the

Region	Category	Total
English	Perfect	1124.
	Cryptogamia	590.
		1714
Scottish	Perfect	884.
	Crypt.	428.
		1232.
Orkney	Perfect	354.
	Crypt.	144.
		498
Swedish	Perfect	933.
	Crypt.	366.
		1299
Lapland	Perfect	379.
	Crypt.	158.
		534
Iceland	Perfect	309.
	Crypt.	233.
		542
Spitzberg	Perfect	16.
	Crypt. + 2 fuci	28.
		36.

only 2 fuci are medicinal.

FIGURE 1.10. Thomas Pennant’s enumeration of botanical species in his copy of *Flora Scotica* (1777). The totals for England, Scotland, and Orkney are compared those of Sweden, Lapland, Iceland, and Spitzbergen. By kind permission of the Trustees of the Natural History Museum, London.

Orkney plants are by the Revd. Mr Low of Birsa possibly imperfect.”⁹⁰ Pennant gave similar enumerations for birds and plants before comparing the numbers of British species with the total enumerations for Sweden, Lapland, Iceland, and Spitzbergen. Pennant derived these comparative national enumerations from Linnaean national floras and Banks’s journals after his voyage to Iceland in 1772 (figure 1.10).

The consolidation of the total numbers of species available in several nation-states was central for assessing the diversity of each region and its potential for improvement. In the list of species Pennant tipped into his copy of *Flora Scotica*, England has more species of animals and plants than any of the other countries listed. Pennant’s approach shows how he used a mixture of his own research, other national floras, and information from correspondents. Examples include George Low, who supplied the enumerations of plants and birds

from Orkney. This allowed Pennant to rank the British Isles against Continental European competitors, proving the economic superiority and potential of the emergent nation-state. Pennant was familiar with these practices of managing information and converting textual descriptions into numerical formats since they have a distinct correlation with the methods of double-entry bookkeeping used to manage his estate and accounts he drew up when publishing books. This literal accounting for species was a common feature in Linnaean natural history and was used to link references across field notes, publications, correspondence, and collections. Pennant's conversion of systematic lists into a numerical format was essential for comparing the potential to improve emergent nation-states. Books, such as Lightfoot's *Flora Scotica*, could be ranked alongside similar works such as Hudson's *Flora Anglica* and Linnaeus's *Flora Lapponica* (1737) to assess the natural-historical importance of Britain and the potential for national improvement on the global stage.

Travel and the Development of "General" Natural Histories

National tours of Britain were not limited to the observation and collection of indigenous flora and fauna. From the mid-eighteenth century, a main motivation for naturalists to travel was to examine the collections compiled by their peers, institutions, and those who had embarked on intercontinental trips. For example, on a journey across England and Wales between 1767 and 1768 Joseph Banks visited "a small collection of rarities hung up museum with nothing uncommon except one monkey" at Cheatham's Library in Manchester and the collection of one "Mr Newton" in Lichfield, who had "lately returned from the East Indies" and accumulated "heaps of shells."⁹¹ Other collections took the form of menageries. Examples include the private menageries of the Duchess of Portland, whom Thomas Pennant visited in 1774; King George III and Queen Charlotte; the Duke of Norfolk, who acquired a reindeer for his menagerie at Greystoke Castle, Cumberland, in 1799; and Joseph Banks, who in 1800 had some emus imported from New South Wales that were released in Kew Gardens.⁹²

The opening of the British Museum in 1759 presented a direct motivation for naturalists to travel from the provinces to London and view Hans Sloane's collection. Another collection that came to

London in 1775 was that of Sir Ashton Lever, which remained in the city until its sale in 1806.⁹³ In London it became easy to view both dead and living exotic animals in zoos, menageries, parks, or in the shops of “animal merchants” such as Brookes of Holborn. For example, poet and naturalist Thomas Gray described seeing a myna bird, cassowary, macaw, leopard, and armadillo at Charing Cross in 1766.⁹⁴ By 1805 the American chemist Benjamin Silliman described how he had examined “the lion and lioness, royal tiger of Bengal, panther, hyena, tiger cat, leopard, orang-utan, elephant, rhinoceros, hippopotamus, great white bear of Greenland, the bison, elk or moose deer, the zebra” in a single afternoon in the city, adding that “most of these were living.”⁹⁵ Pennant examined numerous collections of living and dead animals when on his tour across Continental Europe in 1765 and during his travels around Britain. These included Anna Blackburne’s collection at Orford Hall near Warrington, who had “formed a Museum from the other side of the Atlantic, as pleasing as it is instructive.” This was compiled from specimens sent by her brother, Ashton Blackburne, who had immigrated to New York in the 1760s.⁹⁶

The gathering of information on a global variety of species was not limited to natural history collections. Interests in examining and copying exotic animals from paintings in the private collections of the British genteel elite or those exhibited at the Royal Academy of Arts was another major motivation for Pennant to undertake numerous tours around Britain. The growth of animal painting was especially useful to Pennant when compiling publications such as his *Synopsis of Quadrupeds* (1771).⁹⁷ This book was Pennant’s first attempt to create a “general” natural history designed to include all known quadrupeds from across the globe. While Pennant was preparing this work, George Stubbs (1724–1806), emerged as one of the main pioneers of the genre of animal painting, producing numerous images of exotic animals by the 1760s. Examples include Queen Charlotte’s zebra (1763); the Duke of Richmond’s moose (1770); the kangaroo for Banks, based on a preserved skin and skeleton from New Holland (1772); and an image commissioned in 1765 by the governor general of Madras, Sir George Pigot, which depicts a hunting cheetah, a stag, and two Indian servants (plate 1). All of these images found their way into Pennant’s publications, such as the moose, published as the frontispiece for *Arctic Zoology* (1785) and the kangaroo, published in his *History of Quadrupeds* (1781).⁹⁸

To view valuable artworks, Pennant followed an approach similar to that used when collecting portraits for his Welsh and Scottish tours, many of which were in the possession of aristocrats and fellow collectors.⁹⁹ This involved going to see the owners of these artworks, as evidenced by the inscription on the verso of the watercolor copy of the cheetah written by Pennant's artist, probably Peter Paillou (c. 1720–1790): “The Chittah or Hunting Tyger taken from lord Pigot's painting & with his leave, it is a very exact drawing, the tail except which is a little thick.”¹⁰⁰ After obtaining permission from Pigot, Pennant instructed his artist to copy the cheetah from the painting. However, Pennant had his artist omit the surrounding context so a single image of the cheetah could be inserted into a systematic work of natural history. For this to take place, Pennant's artist had to adapt the original image by removing the crimson linen strips the Indian servants are using to restrain the beast, although its shape, general posture, and number of spots remained the same.

These alterations are reflected in Pennant's description in his *History of Quadrupeds*, which pays particular attention to the physical characters of the cheetah, such as the shape of the head, legs, and feet, in addition to its hunting habits and how it “is tamed and trained for the chase of antelopes.”¹⁰¹ Pennant and Stubbs had a close relationship, and both believed the images they produced and published presented faithful representations of the natural world. Both prided themselves on observing animals in person, such as the cheetah in Pigot's painting, an animal brought back from India and presented to King George III. It could be viewed in Windsor Great Park.¹⁰² Stubbs's personal observation made his painting of the cheetah and stag with two keepers, a reliable source. Paintings were of great importance to Pennant, who in 1768 commented that “painting is an imitation of nature in the representation of objects,” adding that an accurate depiction was impossible “with out consulting the original.”¹⁰³ A major part of Pennant's national tours was taken up by visiting paintings such as that Pigot commissioned from Stubbs, which, after its display at the Royal Academy of Arts in 1765, was kept at Pigot's Staffordshire residence at Patshull Hall. Pennant almost certainly visited the Royal Academy of Arts exhibition and Pigot's estate when traveling from Chester to London.¹⁰⁴ Pennant's use of these images in his publications linked his books to collections compiled by the aristocracy and allowed the owners of these artworks to become patrons of natural history—building

a network to promote the accumulation of useful knowledge. Images extracted from works of art were published in Pennant's *History of Quadrupeds* (1781), *Indian Zoology* (1790), and the first volumes of *Outlines of the Globe* (1798–1800), books that sought to define the biogeographical natural history of major global regions and cement Pennant's natural history patronage network.¹⁰⁵

North American natural history collections became common during the 1760s. Examples include the specimens Banks brought back from Newfoundland in 1767. Shortly before Banks's departure for Newfoundland in 1766, Pennant gave him a notebook titled "These queries I drew up for Mr. Banks during his voyage to newfoundland april 1766."¹⁰⁶ A small book enclosed in tough card wrappers, its general lightness made Pennant's queries easy to carry as Banks traveled over the Atlantic to Newfoundland and across England and Wales to visit Pennant at Downing Hall. At the end of the notebook, Pennant invited Banks to Downing—"Mr Pennant will be happy to receive Mr Banks's orders addressed to him, at Downing, Flintshire." A year later Banks took Pennant up on his offer, arriving at Downing on November 21, 1767, when he gave Pennant several Newfoundland bird specimens and drawings, examined Pennant's natural history collection, explored the local area, and returned the notebook. Banks noted that they observed "a very strange Phenomenon called the Burnt rock" on the local coastline and spent most of their time "almost intirely at home in reviewing a collection of English seashells & crabs."¹⁰⁷ Descriptions of this collection were published in the final volume of Pennant's *British Zoology* (1777). Later on, Pennant added comparative descriptions of Newfoundland species to his interleaved "Catalogue of British Birds" that traveled with him to Scotland in 1769.¹⁰⁸

The notebook of "queries" Pennant gave Banks before his Newfoundland voyage represents the integral role of paper for stimulating collaborative information gathering. It shows how by the late 1760s the geographical scale of questionnaires expanded beyond parochial and national boundaries. This notebook contains questions in Pennant's hand and Banks's responses on the verso of the previous page, supplying Pennant with information he incorporated into *Arctic Zoology* (1785–1787) (figure 1.11). For example, Pennant asked Banks, "What does Charlevoix mean by white porpoises which he says are found in the river St Lawrence"? Banks responded on the facing page:

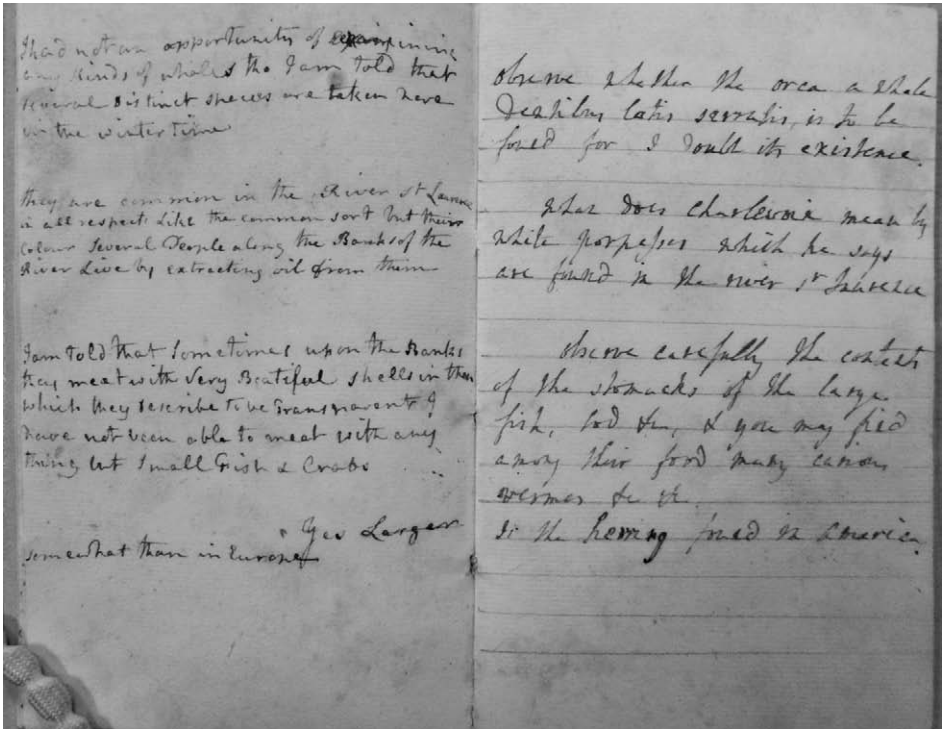


FIGURE. I.II. Thomas Pennant’s notebook in which he poses questions to Joseph Banks about the fauna of Newfoundland (right), who then responds on the verso of the opposite page (left). Reproduced by kind permission of the Warwickshire County Records Office.

“They are common in the River St Lawrence in all respects like the common sort but their colour Several People along the Banks of the River Live by extracting oil from them.”¹⁰⁹ Pennant then used Banks’s information on Newfoundland cetaceans in *Arctic Zoology*: “They [porpoises] are numerous in the gulph of St. Lawrence; and go with the tide as high as Quebec. There are fisheries for them, and the common *Porpoesse*, in that river. A considerable quantity of oil is extracted.”¹¹⁰ Pennant’s lack of citation of Banks’s observations likely contributed to the fierce debates over intellectual property that contributed to a notable dispute between these individuals that lasted for most of the 1780s. Despite this, knowledge on the extraction of oil was of great importance to Pennant, who believed understanding natural history in relation to “all its particular uses in common life” was essential for national improvement.¹¹¹

This interpersonal accumulation of information—by sharing the leaves of a bound notebook—shows how the means for communicating on the natural history of remote regions were integrated with personal conversations and visits to collections throughout Britain. Natural history questionnaires were designed to obtain information on the quantity, geographical distribution, and physical characters of species, allowing Pennant to enumerate the animals of North America. This information was used in works such as *Arctic Zoology* and to provide source material for Johann Reinhold Forster when the latter produced *A Catalogue of the Animals of North America* (1771), a book designed to present “an enumeration of the known quadrupeds, birds, reptiles, fish, insects, crustaceans and testaceous animals.”¹¹² Similar to Lightfoot’s *Flora Scotica*, Pennant supplied Forster with important manuscripts; shared the skills of his artist, Moses Griffith; and assisted in the publication process through providing contacts with the relevant artisans and financial assistance.

Pennant reciprocated those who visited his home at Downing Hall with visits to other collections held in comparable country houses, towns, and cities across the country. These included the multitude of collections held in London, which Pennant visited several times in the 1760s and 1770s. Other collections included Banks’s library, which was noted for the specimens and descriptions brought back from James Cook’s first voyage to the South Seas. Banks wrote to Pennant on the day he returned to London in 1771: “Our Collections will, I hope, satisfy you: very few quadrupeds; one mouse, however, (Gerbua) weighing 80 Ib weight. I long for nothing so much as to see you, but must delay that pleasure for some time.”¹¹³ Later that year, Pennant “took a journey to *London*, to see sir *Joseph Banks* and doctor *Solander*, on their arrival from their circumnavigation.” When recording information on Banks’s specimens Pennant used a notebook titled “Quadrupeds and Birds.” Pennant outlined that the notes contained within relate to creatures “observed and collected by Joseph Banks esq. & Doctor Solander in the voyage round the world begun august 25th 1768 ended July 12th 1771.”¹¹⁴

Pennant’s notebook “Quadrupeds and Birds” is representative of the standard bound notebooks purchased during his journeys and has been encased within a sturdy binding of green vellum. These were combined with Pennant’s manuscript slips and stored in a card envelope inscribed “Birds from the South Sea Mr Banks’s Voyage.”¹¹⁵

Pennant started to use paper slips to manage information after using the system Daniel Solander established at the British Museum in the 1760s and later used for managing Banks's collection. The use of paper slips to manage information was a common practice when compiling lists for taxonomic works, encyclopedias, and dictionaries. For example, Pennant's contemporary, Samuel Johnson, relied on paper slips when revising new editions of his *Dictionary*. These were placed between the pages of the last edition, adding new words alongside their respective definitions.¹¹⁶ Information from the slips was then transferred into an interleaved copy of the *Dictionary*, to which Johnson and his amanuenses added annotated descriptions. This reflects many naturalist's approaches to duplicating names and descriptions across a variety of paper technologies when collecting, compiling, and publishing information.

Pennant's use of Solander's system for managing information on the zoological material becomes apparent from the descriptions of specific genera and species in Pennant's notebook. An example is the genus Solander named *Nectris*, of which Banks collected representative specimens from the South Pacific on December 15, 1769. Banks shot this specimen from a small boat he kept on the *Endeavour*, recording: "Calm this morn. Went in the boat & Killed Procellaria velex *Nectris munda* & *fulginosa*, which two last are a new genus between *Procella* & *Diemendia* this we [Banks and Solander] reckon a great acquisition to our bird collection. My stay out today was much shortened by a breeze of wind which brought me aboard by 11 o'clock & before night blew very fresh."¹¹⁷ In addition to Banks's journal entry, Solander composed a description on a separate manuscript slip and instructed Herman Spöring, a Finnish naturalist and amanuensis who accompanied them on the voyage, to transfer information onto the relevant interleaved pages in their copy of *Systema Naturae* (1766).¹¹⁸ These descriptions were transcribed into another manuscript after Banks and Solander returned to London, which provides a systematic classification for all the new zoological species they discovered.¹¹⁹

When he visited Banks in 1771, Pennant was given supervised access to the manuscripts, illustrations, and specimens Banks and Solander compiled during this voyage. Pennant almost certainly copied these ornithological descriptions from Solander's "Fair Copy of the Descriptions of Animals" before combining this with content from Banks's journal and information obtained through conversations with

Banks and Solander. For example, when Solander derived the name *Nectris* from the Greek word *Nukteris*, the literal translation for which is “Night Bird,” he followed a similar practice to Linnaeus by relating the origin of the name to a behavioral trait common to all species of this genus. In addition to using Solander’s name, Pennant described how the species *Nectris carbonaria* “fly in flocks innumerable at once dip under water all together disappear & then rise as suddenly. These birds with various sorts of *Procellaria* are the common birds of the s. sea as auks are of the north.”¹²⁰ Pennant believed the additional information on social attributes was essential for classifying species according to Ray’s system, which took into account features such as birds’ habitation of land or water, their feeding and sleeping habits, in addition to their physical appearance.

Flexible paper tools were central for bridging between the different systems of classification used by British naturalists. For example, Solander had designed his manuscript slips to facilitate the movement of information across a broad range of theoretical frameworks. As mentioned earlier, when reporting to the trustees of the British Museum in 1765, Solander stated that he had “taken care to describe all those [new species] so minutely, that any Botanist whatsoever, may range them [manuscript slips] according to his own favorite system.”¹²¹ Solander’s system also applied to the British Museum’s zoological collections, solidifying these practices of accessing information for the full range of naturalists regardless of their preferred classificatory system. It also allowed for the information to be restructured as classificatory systems developed.

The use of slips to mediate between systems is apparent from those written by Solander that Pennant integrated into his collection. This is exemplified by the slip concerning the “Natter Jack Toad.” Solander gave this paper slip to Pennant, along with a specimen of the toad, prior to his departure aboard the *Endeavour* (figure 1.12). Pennant kept these slips in small folders made from thick card and his insertion of Solander’s slips shows how these groupings were never compiled by a single actor. Rather, descriptions and slips are the products of collaborative productions involving multiple individuals, reflecting Bettina Dietz’s point on the inherently collaborative nature of Linnaean natural history.¹²² However, Pennant’s slips show that these practices extended much further than the realm of Linnaean botany through his use of them to accumulate descriptions and arrange species published

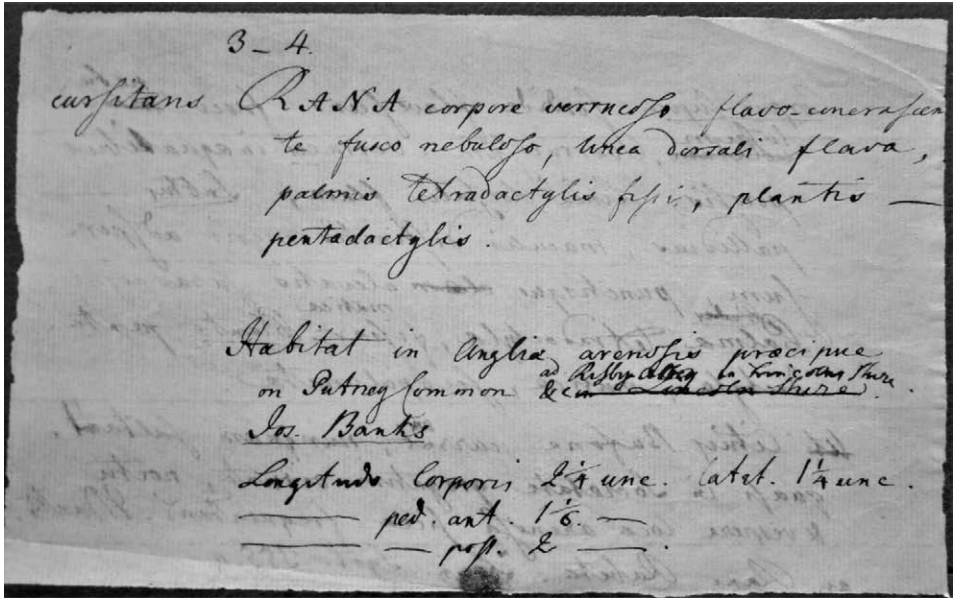


FIGURE 1.12. The slip Daniel Solander gave Thomas Pennant concerning the natterjack toad. By permission of Llyfrgell Genedlaethol Cymru/The National Library of Wales.

in the 1768–1770 edition of *British Zoology*—a book arranged in accordance with the earlier system of John Ray. In his description of the natterjack toad, Pennant added that “it is found on Putney Common, and also near Revesby Abbey, Lincolnshire.” These two localities are places with which Banks was familiar—being his country estate and a popular London botanizing location—and match those outlined on Solander’s slip, while Pennant has added “we are indebted to Joseph Banks, esq; for this account” in his published description.¹²³

Flexible manuscript slips were essential for managing and transferring information between naturalists, regardless of systems of classification. This becomes apparent in the case of *Mosacilla*, a genus containing wagtails and flycatchers, Pennant observed at Banks’s home in 1771. After examining the bird skins, Pennant translated the content of Solander’s manuscript slips into English. Slips were then placed into what would soon be known as Solander boxes, each of which contained slips relating to one Linnaean order. At the top of each slip, Solander gave the page reference to Linnaeus’s *Systema Naturae* (1766), under which he listed earlier published descriptions and depictions of

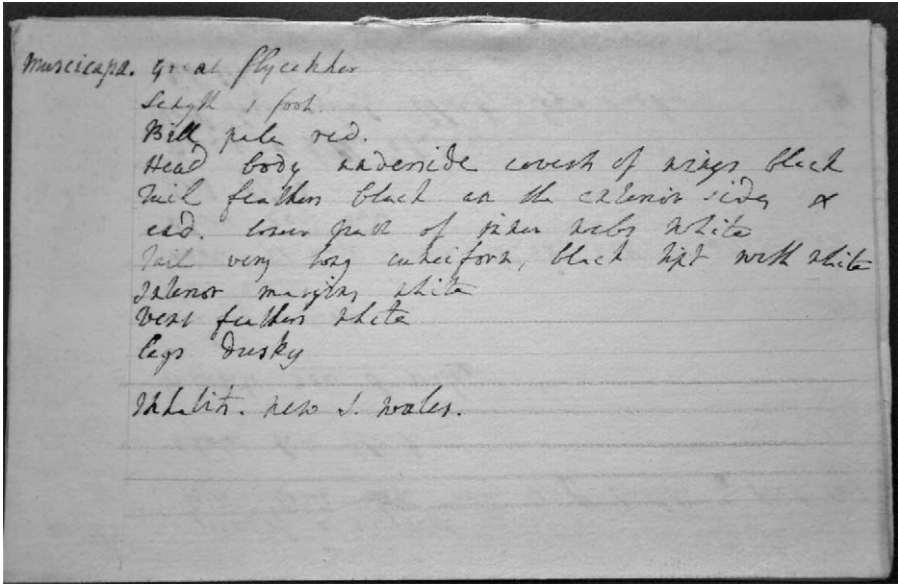


FIGURE 1.13. The last slip in the gathering that relates to the genus *Muscicapa*, which Thomas Pennant used to describe the great flycatcher Joseph Banks and Daniel Solander collected from New South Wales. Signs of previous binding can be seen along the top edge. By permission of Llyfrgell Genedlaethol Cymru/The National Library of Wales.

the species before describing its physical characteristics. In comparison, Pennant used card envelopes to group slips that relate to a specific class of animals and then arranged these according to geographical locality, emphasizing his biogeographical interests. Pennant's slips on the South Seas have been extracted from a notebook; each gathering of leaves was used to describe specimens from a specific genus and many have gilt edges. This is similar to Solander's production of manuscript slips, many of which were cut from the pages of his zoological notebooks, reflecting the transferral of information from a static repository into flexible paper technologies. In the case of the flycatcher, Pennant added a title page to the gathering of slips, on which he noted the genera described within, these being "Muscicapa. Motacilla." Pennant described four new species of flycatcher in this gathering; all of these came from the South Seas, and the descriptions were laid out in a similar manner to those in his notebook (figure 1.13).

Pennant recorded the genus for this bird on the top left of the slip, next to which he gave the vernacular name for the species, the

“Great flycatcher.” This was followed by a description of the bird’s physical features, starting with its general size and moving onto specific characters. At the end of his description Pennant gave the bird’s geographical distribution, “Inhabits. New S. wales.”¹²⁴ The partially bound nature of Pennant’s slips reflects the movement from the use of bound notebooks in natural history collecting to more flexible paper technologies, allowing for the addition and rearrangement of information. The more static nature of Pennant’s manuscript slips and their arrangement by geographical locality, and then by genera, was a result of his long descriptions of physical features, social interactions, and intention to publish this information to present an enumeration of species from defined geographical regions. Slips that relate to species Banks observed in the Pacific could be placed alongside records Pennant obtained from other sources, such as the art collections of the aristocracy, and combined in a published account to create a “general” natural history. The diversity of sources and the need to travel to view collections reflects how Pennant’s global publications were not the product of a sedentary deskbound scholar, but the result of a lifetime of travels across the country.

Through exploring the different kinds of expeditions naturalists took throughout Britain to gather information on a global fauna and flora, we see the development of new practices used to record, order, and standardize information. This was gathered from a diverse array of sources in different settings and across a range of scales of geography and time, extending from explorations of local parishes over decades to more extensive tours taken over a shorter timeframe. The practices explored in the previous pages are representative of those in the right-hand portion of the “genteel” zone of the diagram depicted in the introduction (figure I.1). All the books, notebooks, and paper slips discussed represent objects adapted for use in various natural history enterprises. Several were designed or adapted to facilitate the accumulation of information. Typical examples include interleaving to accommodate notes, while many notebooks were bound in a tough wallet-style binding to protect them from the weather. Other books—including Thomas Pennant’s *British Zoology*, William Hudson’s *Flora Anglica*, and John Lightfoot’s *Flora Scotica*—were designed by their authors to accommodate notes. Many were distributed as gifts or by specialist booksellers to naturalists who planned to use these items

to assess the diversity of plants and animals in their own collections or across a specific geographical locality. Annotated books interacted with a range of notebooks and manuscript slips, many of which were purchased with the intent or adapted to be taken on expeditions. Examples include Pennant's manuscript slips, the thick card envelope being specifically designed to keep them together and protect the precious contents and the small notebook Banks took to Newfoundland—an item designed to travel since it could fit in a jacket pocket.

Interleaved and annotated books were integrated with a broader framework of notebooks, manuscript slips, and images ranging from romantic views to taxonomic representations of species and specimens collected, observed, and extracted from artworks. The processes figures such as Pennant, Gilbert White, and others used to tabulate information both when traveling and in the library was similar to those used by Samuel Johnson, who employed numerous interleaved copies of his dictionary to rearrange words and definitions. Johnson's practices reflect on Baconian approaches to synthesizing and ordering factual information, initiating collaborative working structures with teams of secretaries and family members to edit the dictionary. Collaborative working practices are also apparent through Johnson's notable travels with James Boswell and his bohemian servant Joseph Ritter through the Western Isles, a journey that relied on Johnson's and Boswell's continual exchange of information, aspects of which extended into their literary works. However, as John Radner has suggested, the relationship between Johnson and Boswell remained unequal, with Johnson maintaining control over the public narrative of the trip and straining their relationship in later years.¹²⁵

Similar practices for managing information were used by literate cultures on a global scale. For example, collections of manuscript slips were not only created by naturalists but became a well-established practice for managing information across a range of scholarly disciplines extending into literary cultures outside of Europe. Within Europe, these practices became essential to a range of emergent disciplines. For example, Elisabeth Décultot has explored the "excerpt collections" assembled by the art historian Johann Joachim Winckelmann (1717–1768), suggesting how they form a link between the practical world and book-related knowledge. However, many of examinations of these approaches to managing information have explored them from the perspectives of assimilating and organizing knowledge

or organizing the content of published works from within the confines of a library or study.¹²⁶

In comparison, the current exploration of British natural history practices has shown how such paper technologies became the practical tools of natural history. They accompanied naturalists on journeys ranging from local surveys to national tours, assimilating diverse information while facilitating collaborations between teams of naturalists and with the people they encountered. Many served to structure information ranging from individual images extracted from paintings through to specimens found on the shores of the Crag of Ailsa. They initiated the development of standards for recording information both as illustrations and textual descriptions that brought a broad range of different knowledge bases together. A standardization of practices of collecting and recording information became all the more important as the eighteenth century progressed, witnessing an age when more species defined as new to natural history were discovered before or since, a direct consequence of an increase in global voyages of discovery such as that discussed in the next chapter.