I The natures of cultural history

In 1690, the Perpetual Secretary of the Académie Française, Antoine Furetière, included natural objects in his definition of the symbol in the Académie's *Dictionnaire universel*: 'The lion is the symbol of valour . . . the pelican that of paternal love'.[1] At the end of the seventeenth century it was still commonplace for natural objects to be used as symbols for particular human qualities. A century later, however, such readings had little place in learned writing. As the Revolutionary legislator, Constantin-François Chassebeuf de Volney declared: 'Man is ruled by *natural laws* . . . and these laws, *the common source of good and evil*, are not written in the stars, nor hidden in mysterious codes'. But in rejecting symbolic readings of natural objects, Volney by no means denied that human lessons are to be learnt from natural history. Rather, knowledge of 'the nature of the beings which surround him and [of] his own nature' would teach man the 'motors of his destiny' – in this specific context, the true course of Revolutionary political reform.[2]

The period covered by this volume shows many such drastic shifts in the meanings and human significances of natural objects. But there is one constancy, namely, the importance of the roles assigned to natural history in the commonwealth of learning: as a universal discipline, prior to political, social and moral order; as the partner with civil and sacred history in the revelation of the workings of divine providence; as the universal and stable foundation for the transitory and speculative systems of natural philosophy; as the basis for the agricultural, commercial and colonial improvement of the human estate. Today, natural history seems marginal to our concerns, appearing primarily as an amateur, popular, local study. It is the experimental and mathematical sciences to which debates about the 'true' principles of social and mental order appeal, and which serve as a model of expertise and professionalism.

Nature too has been marginalized and devalued. In his *Die Lehrlinge zu Sais* ('The Apprentices at Sais'), Friedrich von Hardenberg, a Saxon mining official, poet and naturalist better known as Novalis, declared that 'The ways of contemplating nature are

innumerable.'[3] The apprentices live in a museum, working under a master modelled on Abraham Gottlob Werner, director of the Freiberg mining academy. The work opens with their celebration of the multiformity of nature: as inexhaustible treasury of phenomena, to be gathered and ordered by the rational philosopher; as the invincible oppressor of mankind, the nemesis of reason; as a vulnerable enemy to be enslaved by turning her forces against her; as prolific mistress of the poet, whose playful creativity he emulates; as ailing victim of naturalists who plunder her; as longed-for homeland; as wilderness to be tamed and cultivated; as desolation, prison and slaughterhouse; as hieroglyphic, divine language, mirror of the soul.[4]

If a single vision predominates in modern Western society, it is that of a passive and disempowered nature, slave and victim of human agency. Admittedly, notions of an active nature are not altogether extinct: there are, for example, many who adhere to some version of the 'Gaia hypothesis', according to which the Earth is an organism whose harmonious balance, temporarily disrupted by humanity, will eventually be restored.[5] But Novalis' multifaceted creative nature, variously well- or ill-disposed towards mankind, is irretrievably lost. The present volume is concerned with the practices of naturalists from the sixteenth-century revival of natural history to its late nineteenth-century transformation at the hands of practitioners of the new biological sciences. Through these studies, we hope to convey something of the past complexity and diversity of attitudes to nature.

Histories of natural history

In his *Introductory Discourse on the Rise and Progress of Natural History* of 1788, James Edward Smith, purchaser of the Linnaean collections and first president of the Linnean Society of London, sketched the history of natural history from its conjectural origins when man lived in 'a state of nature'. Claiming to offer an impartial account of the merits of past naturalists, Smith tells a story of liberation of natural history from 'superstitious theory', from vulgar insistence on medical utility and from national prejudice (especially French). Linnaeus, Smith claims, was the one who first 'supervised and methodized' the whole of natural history, and subsequent progress has come about through the spread of Linnaean doctrines and methods.

Certain aspects of Smith's account – its placing of natural history in the context of a conjectural universal history of mankind, and its linking of the advancement of learning with the conquest of superstition – are typical of the Enlightened historiography of his period. But there are other features that his account shares with

the vast majority of subsequent histories of natural history: the narration of a progress culminating in the present state of the subject; the emphasis on the discovery by heroic geniuses of doctrines which anticipate current views; and the explanation of the growth of knowledge by the appeal to the use of sound methods. Further, for all their frequent parades of objectivity, they serve to legitimate particular theoretical concerns and disciplinary factions or to locate the historian as practitioner within a particular disciplinary tradition. Such epic histories so re-present and re-work past cultures of natural history as to make them appear directed towards the writer's own time and culture.

It is now fashionable to dismiss such histories *en bloc* – but this is surely a mistake. Victor Carus' *Geschichte der Zoologie* (1872), Julius von Sachs' *Geschichte der Botanik* (1875) and K. A. von Zittel's *Geschichte der Geologie und Paläontologie* (1899), are magisterial histories of zoology, botany and geology which celebrated the consolidation of these disciplines as triumphant natural sciences in the new German *Kaiserreich*.[6] But they are also works whose massive and meticulous scholarship laid a foundation for subsequent interpretations.

The link between upheaval in the life and earth sciences and concern with their histories was evident also in the 1950s, 1960s and 1970s, a period of dramatic developments in taxonomy, genetics and molecular biology, many of which challenged the neo-Darwinian evolutionary synthesis. At the same time the earth sciences were revolutionized by the new plate tectonics. The appearance of a number of major new historical journals, such as the *Journal of the History of Biology*, founded in 1967, and *Histoire et nature*, first published in 1971 under the title *Histoire et biologie*, marked the upsurge in interest. Works such as Bentley Glass et al. (eds.), *Forerunners of Darwin* (1959) and Philip Ritterbush, *Overtures to Biology* (1964) traced the remote ancestry of modern disciplines. At a more local level there were many attempts to find distant anticipations of the latest theoretical innovations. For example, much discussion of the works of the eighteenth-century botanist Michel Adanson was generated by claims that he had invented methods of classification according to the proportion of matches in characters, all characters being equally weighted – methods anticipating those of the new computer-based taxonomy of the 1970s.[7]

It would be a mistake to portray all historiography of natural history of the first half of the twentieth century as built around scientific progress and the anticipation of current doctrines. There are notable exceptions. One is *Form and Function: A Contribution to the History of Animal Morphology* (1916), by Edward Stuart Russell, proponent of a holistic, vitalistic and teleological biology. It is

remarkable for the respect it shows for the categories and philosophical assumptions of past naturalists, and for the sympathy with which it expounds past approaches far removed from the main lines of progress as generally understood at the time. Equally striking are the works of Henri Daudin, pupil of the anthropologist Lucien Lévy-Bruhl, and friend of the cultural historian Lucien Febvre. His *De Linné à Lamarck. Méthodes de la classification et idée de série en botanique et en zoologie (1740–1790)*, and *Cuvier et Lamarck. Les Classes zoologiques et l'idée de série animale (1790–1830)* (1926–7), are notable for the care with which they relate past systems of classification to the specific collecting, horticultural and curatorial activities of the naturalists.

Concern with the history of natural history of another very different sort is a by-product of the rules of botanical and zoological nomenclature established at the International Congresses of Botany, Zoology and Geology in the closing decades of the nineteenth century.[8] Ascertaining the correct names of living beings in accordance with the internationally agreed rules often requires extensive study of the publications and collections of past naturalists. As well as a substantial body of valuable scholarly literature, this professional interest of systematists and taxonomists in the history of their own discipline has produced a series of indispensable reference works – notably, for Britain, Ray Desmond and Christine Ellwood's *Dictionary of British and Irish Botanists and Horticulturalists* (1994), and Frans A. Stafleu et al. (eds.), *Taxonomical Literature* (1976–1988), as well as the *Journal of the Society for the Bibliography of Natural History* (later *Archives of Natural History*), founded in 1936.[9]

Despite these exceptions, the historiography of natural history continued to be dominated by tales of anticipations and progress until quite recently. Since the mid-1960s, however, the emphasis has gradually shifted to approaches that, in Thomas Kuhn's words, 'rather than seeking the permanent contributions of an older science to our present vantage, attempt to display the historical integrity of that science in its own time'.[10] Thus, in the field of history of natural history, a number of works sought to reconstruct the meanings of past theories and systems within the framework of the presuppositions and conceptual categories of their period; notable examples are Elizabeth Gasking, *Investigations into Generation, 1651–1828* (1967) and Mary P. Winsor, *Starfish, Jellyfish and the Order of Life* (1976). Some emphasized the social contexts and uses of the sciences in place of the older 'internalist' chronicles of sequences of discoveries and theories; typical of this reorientation are David Allen, *The Naturalist in Britain. A Social History* (1976), Martin Rudwick, *The Meaning of Fossils* (1972) and Paul Farber, *The Emergence of Ornithology as a Scientific Discipline* (1982).

Others protested at the 'presentism' of histories of scientific progress, with their imposition of current categories, interests and values on past agents; instead, they have sought to understand past agents in their own terms, to reconstruct their mentalities and conceptual frameworks as local and historically contingent creations. In this they have drawn upon the work of anthropologists concerned to do justice to cultural difference, notably Clifford Geertz, *The Interpretation of Cultures* (1973) and, in a quite different vein, Dan Sperber, *Rethinking Symbolism* (1975).

Typical of these new 'anthropological' perspectives in the history of natural history are Wolf Lepenies, *Das Ende der Naturgeschichte* (1976), Scott Atran, *Fondements de l'histoire naturelle. Pour une anthropologie de la science* (1986, of which *Cognitive Foundations of Natural History* (1990) is an amended translation) and Krzysztof Pomian, *Collectionneurs, amateurs et curieux* (1987). In rejecting the traditional narrations of continuity in the growth of disciplines, some have followed Kuhn in claiming priority for local and tacit practices in the formation of the successive and incommensurable 'paradigms' of the sciences. Others have emulated Michel Foucault in focusing on radical discontinuities at the level of discursive practices and institutional regimes. In particular, there has been much debate about Foucault's account, in *Les Mots et les choses* (1969), of an abrupt shift around 1800 of natural historical discourse from static tabulation of the external similarities and differences of plants and animals to dynamic narration of the inner developmental and historical processes of living beings.[11]

Where Foucault emphasized the temporal discontinuities of disciplines, others have attended rather to their spatial and social discontinuities, arguing for the importance of national styles, and of divergences between the metropolis and the provinces, between elites and artisans, between authors and their publics, between men and women. And, as Michel Serres has pointed out, the need for a local historiography is particularly pressing in the case of natural history, given the locality of occurrence of natural objects and the fact that naturalists in different places perceive different natural worlds.[12] Examples of such 'decentred' history of natural history include Bernard Smith's pioneering *European Vision in the South Pacific* (2nd edn, 1985), James A. Secord, *Controversy in Victorian Geology: The Cambrian–Silurian Dispute* (1986) and Mary Louise Pratt, *Imperial Eyes: Travel Writing and Transculturation* (1993).[13]

Cultural history

As a recent reviewer has observed, few historians nowadays 'feel entirely comfortable saying that they *don't* do cultural history'.[14]

The identity of cultural history is hotly contested, and the remarks that follow are unashamedly prescriptive.[15]

Two commitments seem to us to be constitutive of cultural history. First, there is the concern with culture in the sense of that which gives meaning to people's lives, a concern that covers both Matthew Arnold's elitist 'best that has been known and thought in the world' and William Morris's culture 'of the people, by the people, and for the people'.[16] Secondly, cultural history has to deal with culture in the sense of social habits, the totality of the skills, practices, strategies and conventions by which people constitute and maintain their social existences. In both these senses natural history is a cultural phenomenon. For the values which attach to people's lives are informed by natural historical reflections on the place of humans in the natural world; and natural history may provide models for the moral and political order of human society. Further, in so far as natural history is a discipline, it lends itself to treatment in terms of the conventions, skills and strategies – let us call them, collectively, practices – through which knowledge claims have been promoted, secured and defended.

It is, we believe, of the utmost importance for all disciplinary history to do justice to the full range of such practices. Our concern in this book is to illustrate the range and diversity of cultures of natural history over several centuries. Rather than presenting natural historical knowledge as generated by isolated individuals working wholly within the domain of the mind, we wish to portray natural history as the product of conglomerates of people, natural objects, institutions, collections, finances, all linked by a range of practices of different kinds. As a rough and ready guide we may distinguish the following types of practices.[17] *Material* practices are ways of making, handling and transforming things; in the case of natural history they include the gathering, transport and preparation of specimens, the making and distribution of books and illustrations, the performance of experiments. *Social* practices cover the whole range of associations, recruitments, delegations and negotiations; in particular, in natural history, they include the skills of inspiring trust in other natural historians and assessing their trustworthiness, the conventions and strategies relating sponsors and patrons to naturalists and naturalists to informants and assistants, the regulations and routines of behaviour in the institutions of natural history – courts, academies, universities, gardens, museums, laboratories.[18] *Literary* practices are conventions of genre, representation and persuasion; in natural history and other disciplines these include, along with rational argumentation, the gamut of rhetorical and aesthetic forms of persuasion – appeal to historical precedent, to the interest, self-esteem and taste of the reader, for example. *Bodily* practices are forms of bodily,

sartorial or gestural self-presentation and normative accounts of physical and emotional experience in response to particular situations; natural historical examples include the legitimation of natural historical enquiry by appeal to the emotional experiences it engenders, or even accounts of the attire most appropriate for the naturalist. Last, but by no means least, there are *reproductive* practices, that is, the means by which skills and knowledge are handed on from generation to generation; with natural history, as with other disciplines, these include not merely procedures of formal instruction, but also the informal ways in which the various practical and social skills of the naturalist are imparted.

Exaggeration of the powers of one of these categories of practices at the cost of others is responsible for certain distortions and excesses. Social practices are, indeed, of primary importance for all cultural historians, for it is they that constitute and maintain society, with its institutions and forms of association; it is they, indeed, that provide the framework for all human activities. Alas, some have gone further, attempting to reduce all practices to social practices, and venturing extreme metaphysical claims, for example, that truth and rationality in the arts and sciences is but a mask and emblem of power, or that knowledge in the arts and sciences is but a projection of social interests. Literary practices are likewise of paramount importance for cultural historians who deal with learned disciplines. Unfortunately, some have reduced all past social and natural worlds to the surfaces of documents, insisting that both the objects and the authors of natural knowledge are mere projections from the flat plane of the textual universe. One route to this fantasy starts by ignoring the material traces of past disciplines – instruments, buildings, specimens – and goes on to claim that since our only access to the past is through texts, texts are the only genuine subjects of historical enquiry. Another, and more insidious, inference moves from the observation that all human practices embody symbolic and conventional elements to the conclusion that all human practices are at bottom linguistic practices. Such 'pantextualism', much in evidence in the 'cultural studies' sections of bookshops, makes the historian both blind and unjust: blind to the social and natural materials represented in texts and involved in their production, and unjust to those silent majorities who never made it into the world of documents.[19]

In contrast with such belated idealisms, a cultural history that attends to the full range of disciplinary practices can, we believe, do justice to the natural, social and textual worlds. By tracking the local and day-to-day routines of past inquirers, such a history can convey aspects of their lived experience. By studying the means by which they sought to resolve questions, it can reconstruct the ranges of questions real for them, their 'scenes' of inquiry.[20]

By reconstructing changes in investigative practices and the ways they were brought about, it can explain the formation and dissolution of disciplines. And by charting the production, distribution and reception of knowledge claims, it can reveal the ways in which the social and natural worlds give rise to their representations and are transformed by those representations.

Scope of the book

The essays in the volume cover the contents and context of natural history from the sixteenth century to the present. The work falls into three sections, starting at the time when the first botanic gardens were being founded across Europe, in Italy, Holland, France and England, as discussed by Cunningham. Whilst natural history flourished in this medical context, as Cook's essay reveals, Findlen and Whitaker show that it also found powerful support in the courtly and gentlemanly cultures of Renaissance and early modern Europe. Ashworth's essay explores the significances attached to natural historical emblems in these different contexts. Natural history was readily assimilated into the gift–exchange society of the wealthy nobles, which encompassed also the objects of civil history, from paintings to coins. Natural historical objects acquired a concomitant value, since they exemplified the rare, representing the new colonial wealth that could be obtained from the exploitation of the exotic. It was the appearance of natural history as a set of practices favoured by court culture which principally ensured the development of natural history as independent from medical and agricultural concerns. As Johns reveals, the development of print culture in the early modern period offered writers on natural history new opportunities, but also new problems, as they struggled to fix a meaning for natural knowledge.

Our second section covers the period from the end of the seventeenth century to that of the eighteenth century, during which time natural history and its practitioners began to acquire autonomy from courtly culture. The establishment of societies and academies, described by Roche, served to provide naturalists, who were often not of noble birth, with a legitimacy independent of their individual position in the early modern patronage society. As collecting became a pastime of the 'enlightened' classes, increasing the rate at which new specimens flooded into European collections, naturalists were increasingly successful in soliciting State funding for their activities. Naturalists linked their activities to fashionable concerns with natural and experimental philosophy, and with the wider Enlightenment movement, so that, as Koerner shows, the question of the practical and/or natural criteria for ordering natural objects became increasingly fraught for naturalists such as Linnaeus. The

nature of history, too, was open to debate as naturalists distanced their enquiry from that of civil history, whilst many attacked older sacred histories of nature and the earth's past, as Guntau's essay reveals. The use of the microscope and the development of comparative anatomy also opened new realms of enquiry for natural history, as phenomena such as generation or the operations of the mind became legitimate subjects for natural historical enquiry, as Wood and Spary suggest. But, as Schiebinger's contribution shows, the growing power of naturalists to represent the natural allowed them to make normative claims about social relations. By the end of the eighteenth century, radically new forms and agendas of natural historical inquiry were emerging, particularly in the German lands, as Jardine argues.

In our third section, Outram's essay demonstrates the increasing institutionalization of natural history from the beginning of the nineteenth century, showing how the construction of the naturalist and natural historical practice were shaped by place and resources; and both she and Dettelbach indicate how apparently 'new' kinds of enquiry appearing at this time owe much to the Romantic notion of experimentation and the invention of the 'discovering hero'. The work of Beer and Browne also illustrates the relations between place, language and natural historical knowledge; for them, as for Dettelbach, the problem of natural historical knowledge at a distance is what is at issue. Both Beer and Bravo address the problem of ethnocentrism in early nineteenth-century travel accounts, although in rather different ways, and both examine how far natural historical travellers could mediate between distant cultures and their own. Rudwick's essay, too, considers the problems of representing the distant, whether in space or time, which naturalists confronted in their endeavours to present themselves as experts in a new science of the earth. Such problems were manifest not just in the field, but also in the proximate site for the representation of natural historical knowledge, the collection. Where eighteenth-century collections had been aimed at a single public, differentiated only by degree of knowledge, collections came to be differentially designed during the course of the nineteenth century, with one face for amateurs and another for naturalists. Thus they partook in the shaping of 'the public' and its exclusion from natural historical expertise. The essays of Larsen, Allen, A. Secord and Bensaude-Vincent and Drouin address this shift from different perspectives: those of the elite reading public, of artisans, of women, of private collectors. Gradually, natural historical displays ceased to be the site of active research by naturalists: in many institutions, public and research collections were separated; in others, as Nyhart's chapter reveals, the site of natural historical research shifted from the collection to the laboratory.

The contributions to this volume are not intended to be specific research articles. Our intention is that this should serve as a work of first resort, demanding no previous acquaintance with the literature of the history of natural history. Because the chapters are intended for a general readership, each provides an account of the wider framework of the subject area. However, all the contributions embody at least some of our historiographical prescriptions. All avoid anachronism, respecting the categories of the naturalists themselves. Almost all are focused on the practices of natural history; a number deal with the social, political and moral uses of natural history; and many discuss the settings and contexts of natural history. The need for generality and continuity has inevitably produced a Eurocentric bias and limited attention to local and popular issues. However, decentring is evident in the treatment of developments and receptions of natural history outside the spheres of elites and savants, and in the discussion of the impacts of natural historical exploration on indigenous cultures. Taken as a whole, these essays do, we believe, convey the richness and variety of the past cultures of natural history.

History or hyper-reality?

If a single conclusion is to be drawn from this volume, it is that there is no 'natural' conception of nature, no stable inventory of the products of nature, and no universal register of questions timelessly posed by nature. Rather, the contributions reveal how various are the frameworks that have structured and informed natural historians' dealings with nature, how the boundaries between the natural and the conventional, artificial and social have been continually contested and relocated.

No matter how determinedly we seek out the wild, we cannot hope to escape from our time- and culture-bound ways of seeing and interpreting, to encounter nature prior to all perceptual ordering and judgement. Even so-called 'nature reserves' contain not untrammelled nature, but a managed, culled, restricted nature, where access is controlled and where the observer is constantly guided, so that the supposedly natural spaces are rendered just as much 'hybrids' between the social and natural as those areas that ecologists deplore for the human destruction wrought in them.[21] Even when ecologists and naturalists venture into 'virgin' territory, the object of their observations is not raw nature, but nature measured and graded, classified and tagged, registered and simplified. When we consider our present-day forms of representation – photographic, cinematographic, holographic – it is hard to avoid the feeling that they have an unprecedented tendency to cut us off from the natural world. Such simulacra are unambiguously

representational: despite their intensity and reality they bear few, if any, traces of the material objects and the human labour that went into them. Rather, their impact depends largely on their success in conveying the scientific sophistication of their making. The more engaging and convincing the images, the more the viewer is led to take on trust the reliability and authority of scientists and their technologies. In representing nature past and present, such 'hyper-real' images displace and supplant it.[22]

Through historical studies we can hope to regain the natural and human worlds that we are in danger of losing, as we uncover the ways in which humans have worked on natural objects to produce knowledge of nature. Thus we may gain a more critical understanding of our own concerns and dealings with nature. None shall lift the veil of Isis, Goddess of Nature, declared the ancient oracle. But Novalis tells us that one – a historian, no doubt – did succeed, only to see 'wonder of wonders, himself'.[23]