Introduction

This is the story of the life and activities of Henry Dresser (1838–1915), one of the most productive English ornithologists of the mid–late nineteenth and early twentieth centuries, but it is not just his story. It is an exploration of ornithology in Britain during a period when the subject changed dramatically in many ways. Dresser came from a wealthy Yorkshire family and had a very early adventurous life, travelling widely on business in Europe, New Brunswick and even to Texas during the American Civil War. Following on from this adventure he settled into business in London in the timber and iron trades. He had a lifelong interest in birds and built enormous collections of bird skins and eggs, which were – and still are – among the finest of their kind (see plate 1). These collections formed the basis of over 100 publications on birds, notably the enormous and very beautiful *A History of the Birds of Europe*, issued in eighty-four parts during 1871–82 and the standard work on the subject for many years (see plate 2).

Writing in 1959, Philip Manson-Bahr, an English ornithologist (and expert on tropical medicine), recalled meeting Dresser many years before, when Dresser was nearing the end of his long ornithological career:

> Dresser was possessed of demoniacal energy, boundless enthusiasm and immense application. When he took up a subject, he saw it through regardless of any difficulties or obstructions. He had a striking appearance which was arresting in any company. His countenance was pale, clean-shaven with sharp nose and striking intense features. The oddity of his appearance was heightened by a rather ill-fitting wig, because he was completely bald. He had a rapid method of elocution and the words poured from his mouth and almost stunned his audience. He was in fact quite a character in an age of individualism. He possessed vast ambitions and was visibly proud of his achievements in ornithology.
>
> A born collector, he would converse on birds for hours to the exclusion of all other topics and he was most ambitious in acquiring valuable eggs, [bird] skins, and other rare specimens. (Manson-Bahr, 1959: 59)

Dresser was one of the prime movers in ornithology; he witnessed and played a part in many of the transformations that took place in the discipline. Who was he? What did he do? Why? How? These are the questions that this book is concerned with. To answer them requires an understanding of

his working life as a businessman, ornithologist and publisher as well as the relationship between these different activities during what Barber (1980) calls 'the heyday of natural history'. His success in ornithology stemmed from his position within a web of related activities, including field collecting, cabinet collecting (where specimens were bought and exchanged), in scientific societies and society more generally, in publishing and with his readership. These were underpinned by his success in business – which provided the capital to support his ornithological activities – and his position in society, which enabled him to mix with the most aristocratic of naturalists. Ornithology was a contact sport, as its devotees collaborated and competed with one another. An understanding of Dresser's relationships with his contemporaries is crucial to understanding his own story and activities. In answering these questions, this book is intended to explore the motivations and aspirations of someone who was, on the one hand, a most singular and successful individual and, on the other, a representative of a group of men with 'serious hobbies'. More generally, it is an exploration of the process by which baseline ornithological knowledge was created through the activities of individuals in networks, notably the private gentlemen-naturalists who dominated nineteenth-century ornithology.

Dresser was familiar with the leading naturalists of the day and he was a prominent figure in two of the most notable societies, the British Ornithologists' Union (BOU) and the Zoological Society of London. His life spanned a period that saw the development of scientific ornithological societies, scientific journals devoted to birds, the bird conservation movement and institutionalised museum collections in Britain, as well as the emergence of professional ornithologists and international standards for the scientific naming of species. An investigation into his life provides an insight into these changes and how scientific society was transformed from a pursuit of private dilettantes into a landscape of institutions, professionals and practices. During the mid-nineteenth century, private individuals such as Dresser formed the backbone of ornithology in Britain but as the century wore on the British Museum (Natural History) – usually known as the BM(NH) – rose to take control of the ornithological scene. Dresser was sometimes in open conflict with his peers and with some of those most closely associated with the BM(NH). These subjects are explored in order to fully understand the events that took place and the contribution that Dresser and others like him made to ornithology.

This book is based on a large body of previously unpublished archival material, including ten years' worth of Dresser's unpublished diaries (including diaries from his time in New Brunswick and during the American Civil War), letters and photographs in Manchester Museum (see figure I.1). There are 299 letters from Dresser to Alfred Newton, the leading ornithologist in late nineteenth-century Britain, in Cambridge University Library; over seventy letters to George Boardman in the Smithsonian Institution Archives (Washington, DC); twenty-two letters to Richard Sharpe in the Blacker-Wood Autograph Letter Collection at McGill University Library, Montreal; sixty-two letters to John Harvie-Brown in National Museums Scotland; and

I.1 Papers and photographs that belonged to Henry Dresser.

almost 100 letters to Sergei Buturlin in the Ulyanovsk Museum of Local Lore, History and Economy (Ulyanovsk, Russia). One notable source of information is the album of photographs of his scientific correspondents and their letters that Dresser collected, now in John Rylands Library at the University of Manchester. Dresser's published writings on birds form another invaluable source of information; they include large folio books and many scientific papers in journals. His collections of 7,200 bird skins and 6,000 eggs in Manchester Museum are another major source of information, which has been extracted from labels and Dresser's own catalogues of his collections.

Histories of ornithology

The history of ornithology and ornithologists has been the subject of a number of books, really beginning with Erwin Stresemann's classic *Ornithology from Aristotle to the Present* (1951, translated into English in 1975). More recent histories by Michael Walters (2003) and Peter Bircham (2007) deal with worldwide ornithology and ornithology in Britain respectively. David Allen's classic *The Naturalist in Britain* (1976) is remarkably broad in scope but as a consequence gives little detail about the activities of ornithologists. Paul

Farber (1982) studied the emergence of ornithology as a scientific discipline, notably the development of institutional structures and professionals. Mark Barrow's *A Passion for Birds* (1998) examines many of the same themes as the present book, from an American perspective. Professionalised ornithology in America is explored in Daniel Lewis's biography of Robert Ridgway, *The Feathery Tribe* (2012). Barbara and Richard Mearns have produced biographies of many ornithologists (1988, 1992, 1998, 2007). Some of the more prominent nineteenth-century ornithologists have been the subject of biographies, including John Gould (Sauer, 1982; Tree, 1991, 2004; Russell, 2011), Alfred Newton (Wollaston, 1921), Walter Rothschild (Rothschild, 1983, 2008) and Lord Lilford (Drewitt, 1900; Trevor-Battye, 1903). There is an industry based around John James Audubon and his books, including a number of biographies (e.g. Streshinsky, 1998; Hart-Davis, 2004; Rhodes, 2004). Birkhead *et al.* (2014) explored the development of modern ornithology and those who can be linked with current scientific practices, but this approach excludes many of those who were significant figures in their own time, including Dresser.

Thus far there has not been a detailed, critical biography of any of the 'industrialist bird collectors' such as Dresser. The present book has a lot in common with Endersby's biography of Joseph Hooker (2008), although there are some clear differences: Dresser was not in a paid position as a naturalist, and he was an ornithologist rather than a botanist.

Some published histories of ornithology have covered long periods of time, giving an illusion of continuity in the subject (such continuity is contested by Farber, 1982). Notably, hunting and collecting, science, conservation, and concepts of 'amateurs' and 'professionals' have sometimes been written about in ways that would not have been appropriate or even understood in the nineteenth century. Collecting activities have sometimes been sanitised and uncritically justified on the one hand or criticised on the other, in order to produce a single canon of ornithology that links people from the present with those from the past, an approach that is more palatable to modern conservation-minded sensibilities. This book explores the motivations and activities of one particular ornithologist who was both collector and conservationist, and who was active at a time when these now seemingly mutually exclusive activities first started to be disentangled. It also follows the story of an ornithologist who was effectively left behind as ornithology changed beyond recognition.

A cautionary word relating to original sources

This book relies heavily on personal diaries and private letters. I have accepted what is written in these at face value. Dresser's diaries and letters contain personal information about Dresser himself and about those around him. There is no reason to suspect that they contain anything but Dresser's impressions of his own experiences, albeit from a subjective viewpoint (he does not seem to have intended to have them published).

Victorian hobbies and natural history

Dresser's interest in natural history and his ability to follow it reflect a number of widespread movements in British society during the nineteenth century (see Allen, 1976; Barber, 1980; Lloyd, 1985; Armstrong, 2000). In the previous century, hobbies had largely been the preserve of the aristocracy as most people had little free time from work, travel was costly and books were expensive. By the mid-nineteenth century, the middle classes had expanded due to industrialisation, urbanisation, empire and colonialism. Many more individuals had the time and the money to indulge their particular interests, but what was their motivation? Idleness may have been the greatest enemy of any upright Victorian, but the Evangelical Revival dictated that, in order to be permissible, any leisure activity also had to be morally uplifting. This presented a particular dilemma for the upper and middle classes, who, being waited upon by servants, had large amounts of spare time to fill with socially acceptable activities. Natural history provided a suitable hobby, as natural theologians such as William Paley had argued that the study of nature was in effect the study of God's work (see Barber, 1980: 22). Barber writes that natural theology

> gave thousands of amateur naturalists an excuse to kill butterflies and uproot rare plants to their hearts' content…. Motives such as killing boredom might supply the real reason why so many people took up natural history in that period, but natural theology provided, as it were, the excuse, and since the Victorians never allowed themselves to do anything merely for fun, an excuse was essential. (Barber, 1980: 24–5)

Samuel Smiles' *Self-Help: With Illustrations of Character and Conduct*, published in 1859, set out many ways by which to lead a purposeful life, drawing on the life experiences of a variety of successful businessmen, scientists, artists and politicians. Smiles advocated application, taking advantage of opportunities, and developing one's character and broad-mindedness. The book became a best-seller and was reprinted many times through the late nineteenth century.

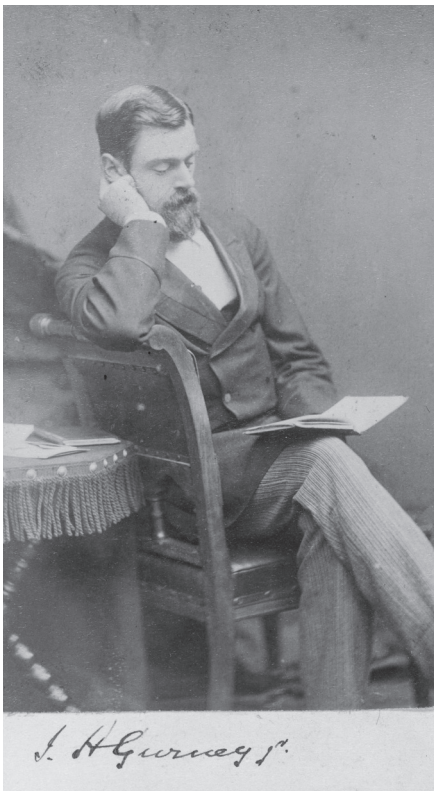
Natural history became a national obsession in Britain, as it did in Europe and America and, farther afield, in colonies and empires. Innumerable books on natural history encouraged people to read about the subject, from the cheapest pulp to luxurious folio volumes that only the wealthiest could afford. In Britain and America in particular, natural history was an activity enjoyed by all social classes (Allen, 1976; Barrow, 1998). If, as the maxim went, the middle classes talked about things while the working classes talked about people, then natural history was a suitable topic for any drawing room.

Part of the craze for hobbies was the development of a 'culture of collecting'. People collected all manner of things and natural history objects were particularly popular. These need not be collections of dead things and many houses had their Wardian case (a kind of miniature greenhouse that gave protection from air pollution), ferneries, aquaria and hothouse plants.

Natural history could be enjoyed as an indoor activity, occupying evenings at the microscope, or in preparing and arranging collections. Nature could be brought back home, bought in markets, swapped with other enthusiasts, grown in the garden, kept in aquaria and studied indoors. Plants were pressed and dried on herbarium sheets; insects were impaled on pins and kept in glass-topped drawers or in picture frames; tiny objects were diligently arranged on microscope slides. Shells, fossils, minerals, bird eggs and skins were arranged – often impeccably – in drawers in cabinets. Display cases of mounted birds decorated many houses. Thus natural history formed an excellent all-encompassing hobby. Weekend forays into the countryside were frequently accompanied by the butterfly net and killing jar, the vasculum (a tin case for keeping picked plants in a fresh condition), the hand-lens and other collecting equipment, including the gun for those in a position to own and use one. Back at home, spare time could be spent in studying, preserving, labelling and arranging new acquisitions into collections. An industry of suppliers of specimens, cabinets, equipment and literature developed to satisfy public demand (Allen, 1976: 141–57; Jardine *et al.*, 1996).

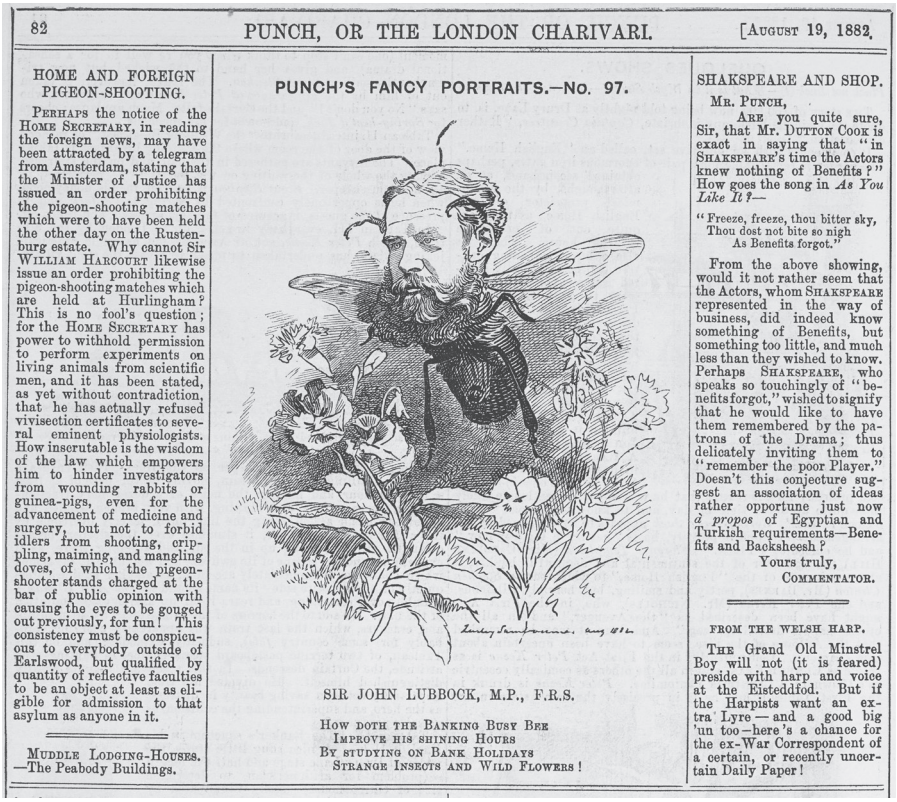
Society life

There were hundreds of clubs and societies throughout nineteenth-century Britain and many of these were concerned with natural history. For example, the Zoological Society of London met fortnightly in Hanover Square (with a summer recess) from 1830 onwards. Natural history societies offered people an opportunity to mix with their peers and superiors, and even to associate with prospective marriage material: women were eligible for full membership of the Zoological Society of London from 1827, for example, 'on the same terms and with the same privileges as Gentlemen Subscribers' (see Scherren, 1905: 25), and women also played a part in the Botanical Society of London (established in 1836) and the Entomological Society of London (established in 1833). However, for the most part, women played a small part (or were permitted to play only a small part) in natural history societies (Allen, 1976: 150–2; Allen, 1980). Natural history therefore offered an opportunity for social advancement, which was of course high on the minds of the socially ambitious middle classes whose activities so precisely mimicked those of their aristocratic 'superiors' (Allen, 1976; Barber, 1980: 37). Some religious sects, notably Quakers, found natural history particularly attractive. Members of leading Quaker families often intermarried, generating great dynasties that encompassed political ideology, religion and natural history interests. The Barclays, Gurneys and Backhouses were particularly prominent in this respect (Allen, 1976: 89–92) (see figure I.2). However, it can be difficult to disentangle cause from effect: shared membership of societies came as a consequence of existing relationships as well as being responsible for establishing new ones.



I.2 John Henry Gurney junior, from Henry Dresser's album of correspondents.

Little enough was known of natural history for anyone with the time and the inclination to make significant contributions to the subject. Many people had 'serious hobbies' for which they became well known in society, going far beyond what would now be regarded as leisure activities. Businessmen would pursue their subject of choice in the evenings and weekends – as well as from their offices, to judge from the frequency of correspondence that was sent from business addresses. Life in learned societies was an important part of the career of many business figures and great value was placed upon intellectual might. 'Amateurs' – not a particularly useful term in the absence of institutions and 'professionals' – were frequently prominent in the larger societies, sometimes devoting more time to their intellectual pursuits than to business. To take one example, Sir John Lubbock (1834–1913) was the senior partner in a London bank as well as a Liberal MP (responsible for the Bank Holiday Act of 1871). During his 'spare' time, living as Charles Darwin's neighbour (and protégé), he was an expert in insect physiology and behaviour, and President at one time or another of each of the Anthropological, Entomological, Ethnological, Linnean and Statistical Societies. Lubbock (figure I.3) has been described as 'the very exemplar of the high-minded, broad-minded City banker' (Kynaston,



82 PUNCH, OR THE LONDON CHARIVARI. [AUGUST 19, 1882.

HOME AND FOREIGN PIGEON-SHOOTING.

PERHAPS the notice of the HOME SECRETARY, in reading the foreign news, may have been attracted by a telegram from Amsterdam, stating that the Minister of Justice has issued an order prohibiting the pigeon-shooting matches which were to have been held the other day on the Rustenburg estate. Why cannot Sir WILLIAM HARCOURT likewise issue an order prohibiting the pigeon-shooting matches which are held at Hurlingham? This is no fool's question; for the HOME SECRETARY has power to withhold permission to perform experiments on living animals from scientific men, and it has been stated, as yet without contradiction, that he has actually refused vivisection certificates to several eminent physiologists. How inscrutable is the wisdom of the law which empowers him to hinder investigators from wounding rabbits or guinea-pigs, even for the advancement of medicine and surgery, but not to forbid idlers from shooting, crippling, maiming, and mangling doves, of which the pigeon-shooter stands charged at the bar of public opinion with causing the eyes to be gouged out previously, for fun! This consistency must be conspicuous to everybody outside of Earlswood, but qualified by quantity of reflective faculties to be an object at least as eligible for admission to that asylum as anyone in it.

MUDDLE LODGING-HOUSES.—The Peabody Buildings.

PUNCH'S FANCY PORTRAITS.—No. 97.

SIR JOHN LUBBOCK, M.P., F.R.S.

HOW DOTH THE BANKING BUSY BEE
IMPROVE HIS SHINING HOURS
BY STUDYING ON BANK HOLIDAYS
STRANGE INSECTS AND WILD FLOWERS!

SHAKSPEARE AND SHOP.

MR. PUNCH,

ARE you quite sure, Sir, that Mr. DUTTON COOK is exact in saying that "in SHAKSPEARE'S time the Actors knew nothing of Benefits?" How goes the song in *As You Like It*?—

"Freeze, freeze, thou bitter sky,
Thou dost not bite so nigh
As Benefits forgot."

From the above showing, would it not rather seem that the Actors, whom SHAKSPEARE represented in the way of business, did indeed know something of Benefits, but something too little, and much less than they wished to know. Perhaps SHAKSPEARE, who speaks so touchingly of "benefits forgot," wished to signify that he would like to have them remembered by the patrons of the Drama; thus delicately inviting them to "remember the poor Player." Doesn't this conjecture suggest an association of ideas rather opportune just now *à propos* of Egyptian and Turkish requirements—Benefits and Backsheesh?

Yours truly,
COMMENTATOR.

FROM THE WELSH HARP.

THE Grand Old Minstrel Boy will not (it is feared) preside with harp and voice at the Eisteddfod. But if the Harpists want an extra Lyre—and a good big 'un too—here's a chance for the ex-War Correspondent of a certain, or recently uncertain Daily Paper!

I.3 Cartoon of John Lubbock, the 'banking busy bee', from *Punch*.

1994: 296). He was only one – albeit a particularly successful one – of many businessmen, including Dresser, who effectively had two 'careers', or a career made up of business and social elements. Notions of 'work' and 'leisure' do not apply in the same sense as they do today.

Social aspects of hunting and collecting birds

While natural history was a mainstream pastime, specialist subjects were associated with particular groups of people. Some, such as botany and shell-collecting, were enjoyed by both men and women. Ornithology was associated with the wealthiest of collectors, and was entirely dominated by men, as it often involved shooting and hunting. Dresser's photograph album of his scientific correspondents includes only two women among 266 photographs, both of whom were the wives of famous ornithologists (so explaining their inclusion in the album). Lucy Audubon (see figure I.4) was the wife of John James Audubon, who was famous for producing *The Birds of America*. Claudia

I.4 Lucy Audubon (wife of John James Audubon), from Henry Dresser's album of correspondents.

Hartert features in a photograph alongside her husband Ernst, a prominent museum curator (see figure 11.2, p. 189).

Ornithology had a moral stamp of approval as it took young men outdoors into the fresh air and promoted manly characteristics of vigour and hunting prowess. Charles Darwin wrote how, as a young man:

> How I did enjoy shooting, but I think that I must have been half-consciously ashamed of my zeal, for I tried to persuade myself that shooting was almost an intellectual employment; it required so much skill to judge where to find most game and to hunt the dogs well. (Darwin, 1958: 55)

Henry Dresser's younger brother Arthur, who did a lot of collecting in New Brunswick, wrote in a similar vein:

> The study of ornithology has many attractions, and will prove a great source of pleasure to all who have inclination and time to pursue it. This branch of Natural History proves deeply interesting to young men on account of having to use the gun so much and also the pleasure of being out in the fresh air.[1]

Many of the photographs in Dresser's album of correspondents show their subjects posed with guns, often in photographers' indoor studio settings,

reflecting the image that they wished to present of themselves to others (see figure I.5).

Nineteenth-century ornithology in Britain was dominated by an elite group of (male) collectors. While many other European countries had long-established bird collections in museums, Britain lagged behind its Continental rivals (see Mearns and Mearns, 1998: 71–103). The natural history collections of the British Museum languished until the middle of the century when they were split off to form the British Museum (Natural History) – usually known as the BM(NH) – which finally opened in 1881 (Sharpe, 1906: 82–3; Knox and Walters, 1992). Richard Sharpe of the BM(NH) considered that the lack of a strong natural history museum had been part of the reason for the development of immense private collections of birds and eggs that was typical – and distinctive – of British ornithology and ornithologists. Reflecting on the state of ornithology in Britain in the early–mid-nineteenth century, he wrote:

> It was undoubtedly the want of management on the part of the Museum Curators that led to the formation of the great private collections of the nineteenth century. It was on these that all the sound ornithological work of this country was based, and no one cared to visit the British Museum, unless he were forced to do so for the purpose of examining some special type or historical specimen. (Sharpe, 1906: 84)

On a more local level, many natural history societies, as well as literary and philosophical societies, held their collections in museums that were more or less restricted to their members. Civic museums as we know them today were very much in their infancy, mostly dating after the Museums Act of 1845, which gave town councils the powers to establish them (Black, 2000; Yanni, 2005; Burton, 2010).

The practicalities of bird collecting

Mid-nineteenth-century ornithologists lacked the camera, the telescope (excepting fairly basic 'eyeglasses') or binoculars. Their most popular tool was the gun, for shooting birds; the American Elliott Coues once advised 'the double-barrelled shot gun is your main reliance … *get the best one you can afford to buy*' (Coues, 1874: 5, original emphasis). Others used their wallets and their wits to acquire dead or preserved birds from other collectors, in auctions and markets, and from anyone who could obtain good specimens. Books were, of course, an important tool, the most popular being the ubiquitous 'Bewick', 'Yarrell' and 'MacGillivray': Bewick's *A History of British Birds* (1797–1804) (which even gets a mention in Austen's *Jane Eyre*), Yarrell's *A History of British Birds* (1843) and MacGillivray's *A Manual of British Ornithology* (1840–42). Books were, for the most part, illustrated by black and white engravings that were of limited value for identifying birds. A collection of preserved birds was

I.5 Horatio Wheelwright (the 'Old Bushman'), from Henry Dresser's album of correspondents.

an indispensible tool for an ornithologist, something that could be referred to as an identification aid, even if it did take up a bit of houseroom. Being attractive, collections of mounted birds doubled up as household ornaments, as trophies of successful hunting trips and as specimens for natural history study.

Ornithology was a specimen-based discipline: bird specimens were studied closely to distinguish new species and to understand how the plumage of each species varied and developed over time. Specimens also provided solid evidence of the occurrence of particular birds in particular places. The maxim 'what's hit is history and what is missed is mystery', used by Horatio Wheelwright (the 'Old Bushman' – figure I.5) and many others, was frequently cited as a justification for killing rare birds, even into the twentieth century. In the days before photography, the bird itself was the only possible material evidence that could be obtained to prove the occurrence of rare species. For anyone who aspired to become an ornithologist, a collection of bird skins or their eggs was *de rigeur* if they wished to be taken seriously.

Birds required comparatively complicated preservation methods, involving the removal of the skin from the body, cleaning tissue and fat from the skin and making an artificial body, whether posed or preserved as a flattish study skin (that lay on its back, to fit easily within a drawer in a collections cabinet, with data labels attached to the legs and safe from the ravages of daylight and insect pests). Mounted specimens were common enough in the homes of 'ordinary' people, but ornithologists mainly collected study skins: specimens

that were remarkably uniform in appearance as a result of conventions in their preparation. This uniformity enabled birds from different places and different times to be readily compared with one another, and exchanged between collectors. Study skins were also easier to transport than ungainly mounted birds.

Bird collecting had one particular drawback, shared with insect and plant collecting, in that bird skins and feathers were susceptible to being eaten by the larvae of various beetles and clothes moths. Bird collectors used 'arsenical soap', consisting of soap mixed with powdered white arsenic, salt of tartar, camphor and powdered lime. This was worked into a lather that was applied to the inner surface of bird skins, producing an effective deterrent against pests (Farber, 1977; Morris, 1993; Mearns and Mearns, 1998: 43). Arsenical soap had been invented by a French apothecary, Jean-Baptiste Bécoeur (1718–77), and popularised in Britain during the 1820s and '30s by Thomas Bowdich (Anon., 1820) and Captain Thomas Brown (1820) in manuals on taxidermy. Brown's *The Taxidermist's Manual* ran to twenty-seven editions, the last appearing as late as 1876 (Rookmaaker *et al.*, 2006). The spectacular rise in popularity in bird collecting that took place through the first half of the nineteenth century was attributed to the popularisation of arsenical soap and changes in gun technologies (Farber, 1977, 1980, 1982; Morris, 1993; see also Schulze-Hagen *et al.*, 2003; Steinheimer, 2005), although the step-by-step instructions for preserving bird skins given in collecting manuals may have been equally important. The invention of new gun technologies, such as special 'dust shot' (fine lead shot that reduced the level of damage to specimens) for use in shotguns, certainly contributed to the increase in popularity of bird collecting, as did the growth of travel (Mearns and Mearns, 1998: 51–3; Morris, 2010).

By 1870 or so, there were numerous manuals available (in addition to reprints of older books) that covered all of the features of collecting: sourcing specimens, preserving them, arranging them, labelling them and so on. To give one example, Edmund Harting's *Hints on Shore Shooting* (1871) described methods for keeping bird corpses from getting soiled by blood and other bodily fluids, skinning and preparing study skins, and poisoning bird skins with the ubiquitous arsenical soap, giving useful step-by-step instructions. In America, the Smithsonian Institution published notes on how to collect and preserve animals to ensure that budding collectors had the necessary skills to provide the Institution with good-quality specimens (see chapter 6). Elliott Coues issued *Field Ornithology* in 1874 with detailed instructions on shooting birds and cleaning guns, selecting a good dog to help with collecting, killing injured birds, transporting dead birds, taxidermy, labelling and making observations; the book was reprinted many times.

Serious collectors maintained a catalogue of their collection to manage their specimen-related information. Edmund Harting issued a blank catalogue in 1868 that collectors could use to list their own collections, entitled a '*Catalogue of … in the Collection of …*' (Harting, 1868). This led one reviewer to comment that 'a collection without a catalogue is reduced to half its real value' (Anon., 1868). A number of other publications were intended to be cut into

labels with which to label collections in cabinets. Edward Newman published such a species list in 1845 for British vertebrates (Anon., 1845).

Natural history periodicals were an important means of keeping up to date with what was happening and two in particular were popular among bird enthusiasts: the *Zoologist*, founded in 1843 (issued monthly; it was amalgamated into the journal *British Birds* in 1916), and *The Field*, which began circulation in 1853 as a weekly newspaper (now a monthly magazine) on field sports and country matters (Bourne, 1988). Many natural history clubs and societies published their own proceedings and journals.

How many species, and what to call them?

The discovery, categorisation and description of nature were fundamentally important during the nineteenth century, as the world was opened up as a result of travel, exploration, imperialism and colonialism. It would have been thought entirely appropriate that the natural productions of the Empire should be sent back to the seat of Empire, just as if they were commercial commodities. The collecting and transporting of natural productions were important elements of 'scientific imperialism', a movement that combined scientific enquiry, often in the form of natural history, with economic growth and political relations. For many aspiring scientific travellers (cum collectors and writers), the formation of a collection was of the utmost importance. Collecting specimens was a necessity as they would need to be compared with others in Western museums in order to establish what species they belonged to – or, more excitingly, whether any belonged to new species.

If a naturalist came across ('discovered') a species that they thought was unknown to science, the accepted scientific practice was that it had to be described in a book or scientific journal, given a unique two-part scientific name (for example *Turdus merula* for the Blackbird, *Turdus* being the genus, to which a number of similar species belong, and *merula* referring only to this particular species) and a description that set out the characteristics that can be used to separate it from similar species. Towards the end of the nineteenth century, some naturalists began to give a third part to scientific names, referred to as a trinomial, to recognise local variations (subspecies) within particular species. The specimens that were used as the basis of such descriptions, called type specimens, were considered to be particularly valuable and were deposited in private collections and museum collections for indefinite preservation (Farber, 1976, 1982; Johnson, 2005). In earlier times, when preservation techniques were less well developed, illustrations of new species were especially important (as specimens often deteriorated), and artists accompanied many of the great voyages of discovery (Farber, 1977, 1982). Most type specimens were kept in European and North American museums or private collections during the nineteenth century (with the notable exception of the Indian Museum, which had been established in Calcutta as early as 1814). Consequently, any

supposedly 'new' species needed to be assessed in the West, by comparing them with type specimens.

Almost as important as identifying new species was the delineation of the distribution of each species. Every specimen could potentially add empirical knowledge on the geographical range of species, so collections need not be confined to rare things and it was better to build up a representative selection of all the species found in a particular area (especially when travelling in remote regions). As it became easier to acquire specimens, 'serial collecting' (acquiring series of each species) became increasingly common, so that serious collectors were no longer content to possess one or two specimens of each species. Taken together, these developments saw scientific travelling reach new heights during the mid- and late nineteenth century. Vast amounts of information and specimens were accumulated as a consequence. One of the less recognised tasks of late nineteenth-century ornithologists was the synthesis of great amounts of information into a coherent whole. For instance, scientists, travellers and collectors named species that they thought were new over and over again, so that a single species could have many different names, causing great confusion. While less exciting than discovering new species, this synthesising of information was just as important a task.

Note

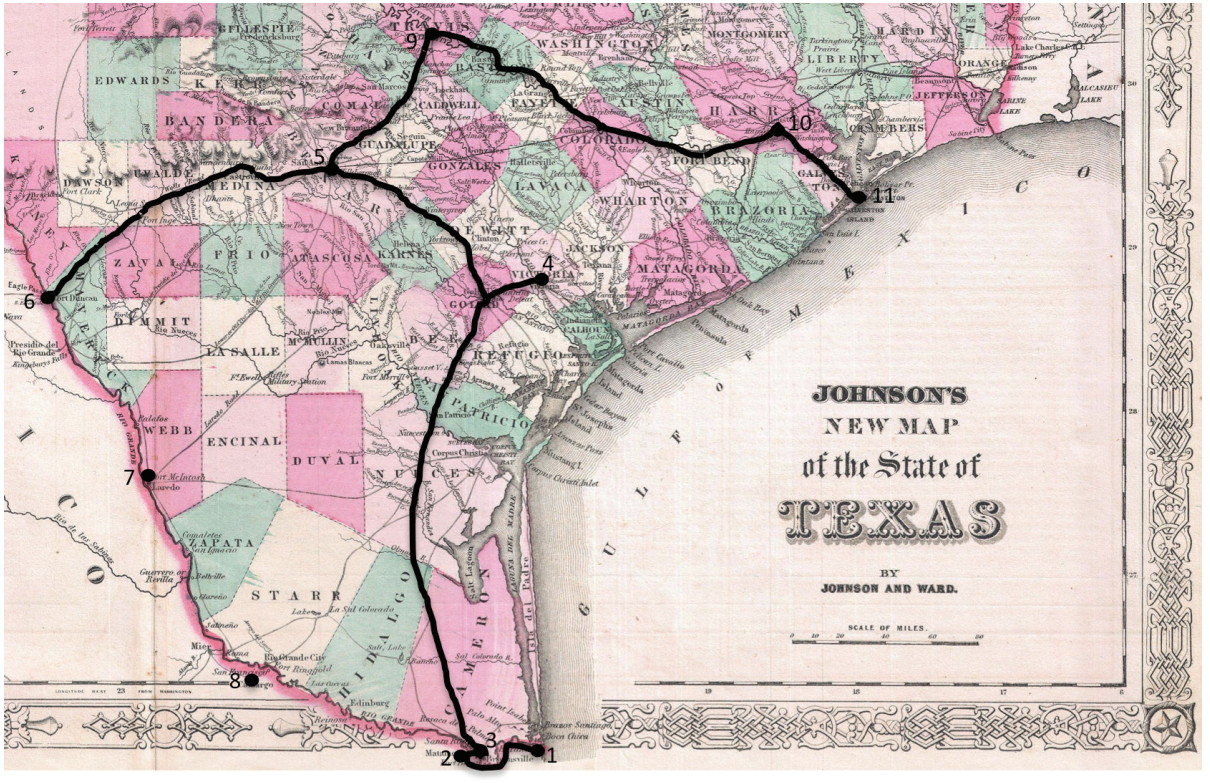
1 National Archives of Canada, Ottawa, Microfilm reel A-1536, *Birds of Canada* by A. R. Dresser, Preface.

1 Gyr Falcon skins from Henry Dresser's collection, including two dark-plumaged 'Labrador Falcons'.

2 Female (left) and male Steller's Eider, from *A History of the Birds of Europe.*

3 Male Smew, Norfolk.

4 Buff-breasted Sandpiper from *A History of the Birds of Europe*, based on a bird collected by Henry Dresser at Matamoros.



5 Map showing Henry Dresser's routes through Texas and places mentioned in the text: (1) Bagdad, (2) Matamoros, (3) Brownsville, (4) Victoria, (5) San Antonio, (6) Eagle Pass, (7) Laredo, (8) Camarga, (9) Austin, (10) Houston, (11) Galveston. Background map based on Johnson's New Map of the State of Texas (1866).

6 Curlew Sandpiper from *A History of the Birds of Europe*; the illustration of the bird in the foreground was based on a bird Henry Dresser bought in a Barcelona market.

7 Glossy Ibis from *A History of the Birds of Europe*, the illustration on the right is based on a bird Henry Dresser bought in Barcelona.

8 Philip Sclater, from Henry Dresser's album of correspondents.

9 Richard Bowdler Sharpe, from Henry Dresser's album of correspondents.

10 Edmund Harting, from Henry Dresser's album of correspondents.

11 Henry Elwes, from Henry Dresser's album of correspondents.

12 Waxwing adults, nest and chicks based on specimens collected by Henry Dresser, from John Gould's *The Birds of Great Britain*.

13 Golden-cheeked Warbler from an article by O. Salvin. The bird that formed the basis of the central figure was given to Henry Dresser while he was in Texas.

14 Hooded Merganser male (foreground), female (swimming) and chicks, from *Supplement to A History of the Birds of Europe*, based on specimens sent to Henry Dresser by George Boardman.

15 Male (left) and female Surf Scoter from *A History of the Birds of Europe*, based on specimens shot by Henry Dresser in New Brunswick in 1862.

16 Flock of Knot flying in to roost, Norfolk.