

**'The Sympathy of a Crowd': Periodicals and the Practices of Natural History in  
Nineteenth-Century Britain**

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**ABSTRACT**

This thesis examines the close relationship between periodicals and the scientific practices of natural history in Britain during the second half of the nineteenth century. It argues that the remarkable expansion of the periodical press from the 1850s onwards had profound implications for the ways in which scientific knowledge was produced, changing how naturalists circulated information, opinions, and specimens. Focussing on four specific practices of natural history - correspondence, collecting, classifying, and associating - the thesis demonstrates how periodicals were informed by these practices and, in turn, the ways these practices were facilitated and shaped by periodicals. Much of this thesis draws upon the correspondence archive of Henry Tibbats Stainton (1822-92), one of the most eminent entomologists of the nineteenth century. He established and edited three natural history periodicals: the *Entomologist's Annual* (1855-74), the *Entomologist's Weekly Intelligencer* (1856-61), and the *Entomologist's Monthly Magazine* (1864-present). Stainton's letters, held by the Natural History Museum in London, are therefore among the largest collections of material relating to the running of scientific journals outside of the Royal Society. Despite this, neither Stainton's correspondence nor the periodicals he produced have been subject to sustained analysis by historians. This thesis therefore employs these sources to reveal how different kinds of scientific community were formed by periodicals, and how these communities utilised the periodical medium to articulate a shared sense of identity. The *Intelligencer* serves as a particularly instructive case study, as this weekly periodical applied newly developed printing technologies to the established mode of letter-writing, industrialising scientific correspondence and encouraging active participation in natural history amongst a wide range of individuals. The thesis thereby engages with key historiographical debates over 'popular science' and professionalisation of the life sciences in this period.

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## INTRODUCTION

### Periodicals and the Practices of Natural History

'Why do entomologists want a weekly newspaper?' is a question asked by the first number of the *Entomologist's Weekly Intelligencer* in 1856, as apparently it was not self-evident why those who studied insects should have their own dedicated periodical.<sup>1</sup> This thesis provides an answer to the same question, addressing the ways in which such publications changed how scientific knowledge was produced. Natural history, of which entomology forms a single branch, was the most popular and widely pursued science of the nineteenth century. At the same time, the periodical press went through an unprecedented expansion, the result of technological advances that reduced production costs and thereby made print increasingly accessible for a growing reading public. Consequently, a great number of periodicals devoted to natural history subjects were produced, bearing such titles as the *Naturalist*, the *Entomologist*, and the *Zoologist*. Many of these were short-lived, as according to one editor, the 'struggle for existence' and 'survival of the fittest' were evident 'among popular scientific journals as well as among other and lower organisms'.<sup>2</sup> These publications brought together a wide range of individuals, exchanging information, opinions, and specimens, forming communities based upon shared practices. As the *Intelligencer's* editor described it, periodicals could produce the 'sympathy of a crowd'.<sup>3</sup>

This thesis argues that these periodicals played an inherent part in the production of scientific knowledge during the nineteenth century, rather than simply being a medium through which the end results of research were presented. The pursuit of natural history is closely tied to the practices of fieldwork - going out into nature to observe and collect plants, insects, birds, fossils - but this does not create knowledge in and of itself. Instead, the localised efforts of individuals are transformed in the process of circulation, only becoming knowledge at the point when it is communicated to others. The reading and writing of periodicals is a vital bridging practice through which this occurs, and it is therefore necessary to examine the modes and conventions that were adopted by these publications. The vast majority of natural history periodicals from this period have

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<sup>1</sup> *Entomologist's Weekly Intelligencer*, 1 (1856), p. 1.

<sup>2</sup> *Hardwicke's Science-Gossip*, 23 (1887), p. i.

<sup>3</sup> *Entomologist's Annual* (1857), p. 7.

hitherto not received a great deal of attention from historians, and this thesis thereby remedies a considerable historiographical deficiency.

Just as the periodicals themselves require keener analysis, the lives and experiences of the varied individuals who produced and contributed to these publications are in need of further investigation. This thesis is also concerned with the way these naturalists created communities, and how scientific practices shaped and were informed by these communities. This is fundamentally a question of who participated in science, and what was considered to be scientific or not. Publications such as the *Intelligencer* allow for an examination of how practitioners negotiated questions of trust and credibility, and how certain kinds of people were included or excluded from the project of science. This plays into debates over the meanings and history of 'popular science', which was an emergent and contested concept in nineteenth-century Britain. Closely related to this development are the efforts of select men of science to carve out a new, professional identity for themselves, often characterised as the antithesis to the kind of 'amateur' practice exemplified by many who pursued natural history. This simplistic dichotomy belies a far more complex process by which such categories and differentiations were drawn in this period, and it is possible to trace this through a sustained focus on particular periodicals and the persons involved with these publications.

### **The Microlepidopterist**

The *Entomologist's Weekly Intelligencer* (1856-61) was established and edited by Henry Tibbats Stainton (1822-92, fig. I.1), one of the foremost entomologists of the nineteenth century. Although this thesis is not intended to be a biography, Stainton's life serves as an instructive example through which to study natural history periodicals in this period. His renown has not survived to the present, but Stainton was nevertheless a key player within the same metropolitan scientific community as many figures whose fame has been more durable. His extensive network of correspondence includes most of the period's more recognisable names in the life sciences, including Charles Darwin, Thomas Henry Huxley, and Richard Owen. Stainton continues to be respected among present-day entomologists, and much of his work has stood the test of time. Specialising in microlepidoptera - a grouping of moth families characterised by their small, sometimes microscopic size - his knowledge in all branches of entomology was highly regarded. His *magnum opus*, the 13-volume *Natural History of the Tineina* (1855-73), is

an exhaustive and lavishly illustrated account of a particular taxonomic subsection of these insects, describing the 'habits and transformations of the various species of that most interesting group of smaller moths'.<sup>4</sup> Published in four languages, with English, French, German, and Latin text all contained in each of the volumes, it remains an important reference work. The coloured plates, by distinguished entomological artists William Wing and E. W. Robinson, show each moth in every stage of its life-cycle, and are remarkable works of natural history illustration that in some cases prove more useful than the very latest digital photography. Alongside his books and numerous articles in scientific journals, Stainton's specimen collections are a significant part of his legacy, bequeathed to the Natural History Museum in London after his death, and forming a considerable portion of that institution's entomological holdings. Of greater import to this thesis, however, is the correspondence archive the museum inherited alongside these insects. This consists of around 14,000 letters which have not previously been subject to detailed investigation by historians. These form one of the largest collections of material - other than the Royal Society's archives - relating to the establishment and running of a scientific periodical, investing the correspondence with a far greater significance beyond the specifics of Stainton's life. This thesis draws heavily on these letters, reading them alongside the periodicals in order to give a deep insight into the mechanics of producing such publications.

Stainton was 'possessed of an ample fortune', permitting him to devote the majority of his time to entomology, for which he acquired a taste in childhood. He never held a salaried scientific position, as there was simply no necessity for him to do so. This is not uncommon among many of the pre-eminent figures in natural history and other sciences during this period, although an increase in professional positions was certainly evident during Stainton's lifetime. Stainton's wealth was acquired through his father, also named Henry, who was director of the Carron Iron Company, a prosperous, Scottish-based ironworks that had manufactured cannons - or rather, carronades - during the Napoleonic Wars. Stainton senior had abused his position, defrauding the other shareholders, a crime for which he escaped the worst consequences by dying (in 1851) before any legal action could be taken against him. The profits from this felony allowed Stainton senior to build Mountsfield, a large residence located in the London suburb of Lewisham, which he presented to his son as a wedding gift in 1846. Stainton junior

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<sup>4</sup> Henry Tibbats Stainton, *Natural History of the Tineina*, 13 vols (London: John Van Voorst, 1855-73), I (1855), p. iv.

would live here for the rest of his life, with his home becoming a hub of entomological activity. The house itself was demolished in 1905, but the substantial grounds now form part of a public park bearing the same name. Along with his father's riches, Stainton junior inherited responsibility for representing the family in court. Although not implicated in any wrong-doing himself, he was involved in lengthy, almost Dickensian proceedings well into the 1860s. The exact outcome is unclear, but it seems Stainton junior's finances did not suffer too greatly as a result. It is a matter of speculation whether the ill-gotten nature of his 'ample fortune' was the impulse behind Stainton's apparent generosity and philanthropic interests. He 'used his means freely to assist any cause or person that he deemed to be deserving', and took a 'great interest' in the 'educational and charitable institutions of the parish of Lewisham'. Even allowing for some glossing by his obituarists (close friends Robert McLachlan and J. W. Douglas), his correspondence provides plentiful evidence that this was true. It is also worth noting, as his obituary did, that 'in politics he was an energetic Liberal, but became a dissident on the division of the party', a reference to the split that occurred in 1886 between supporters of Irish home rule and the Liberal Unionists who opposed it, with Stainton apparently favouring the latter.<sup>5</sup>

Stainton spent much of his life writing for and editing natural history periodicals. According to his obituary in the *Entomologist's Monthly Magazine*, a publication Stainton helped to establish and edit, 'only a few days before his death he looked over the revise of the No. for December, 1892, and detected an error in time for correction'.<sup>6</sup> It is clear that Stainton held a strong belief in the importance of periodicals to the practice of science, given the great amount of his time, energy, and money that he invested in producing them. In addition to the aforementioned *Intelligencer* and the *Entomologist's Monthly Magazine* (1864-present), he also established and edited the *Entomologist's Annual* (1855-74). None of these publications were run for profit. Despite suffering from indifferent health for much of his life, he exemplified the energetic Victorian man of science. He reportedly awoke at five o'clock every morning in order to study and work in the hours before breakfast, and advised others to do the same. Stainton was not bound to his desk, however, and it is essential to note that he was a practical entomologist, in the sense that he was very heavily involved in the collecting and preparation of his own specimens. Unlike some wealthy naturalists, he

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<sup>5</sup> *Entomologist's Monthly Magazine*, 29 (1893), pp. 2-4.

<sup>6</sup> *Ibid.*, p. 3.

did not entirely source his insects from dealers, but took regular excursions around Britain and Europe to gather them himself. He recounted to his friend, Robert McLachlan, one such trip made in the company of another entomological companion, J. W. Douglas:

On Wednesday evening I went at dusk to the sallow pit[.] I found Douglas was there, with his umbrella. I tried sweeping with my net. No go! There was plenty of [*Nonagria*] *despecta* flying about & once Douglas had a worn [*Monochroa*] *arundinetella* in his umbrella - but it escaped before he could box it & he now comes to the conclusion that they are too worn to be of any good.

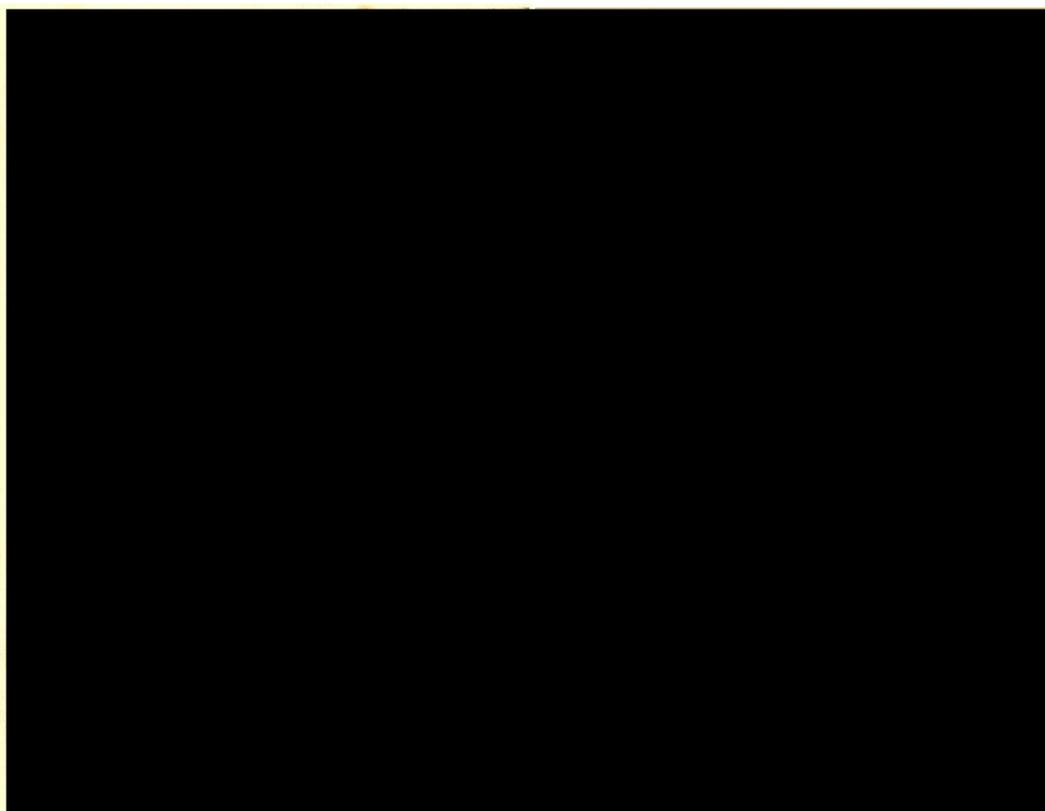
Last night I was there again, but it was a cold wind & even the *despectas* were not so plentiful - of *arundinetella* I saw not a vestige.<sup>7</sup>

Both the species referred to by Stainton are moths which occur in damp, swampy environments. The 'sallow pit', presumably named after the willow trees that grew there, was a pond in the fields around Lee, a town close to Lewisham, and seems to have been a favoured hunting ground for entomologists in that area. A letter from Douglas, published in the *Intelligencer*, describes the spot as a 'beloved retreat of water-beetles'.<sup>8</sup> Stainton's account gives us a glimpse into the practices of insect collecting that will be discussed in further detail by subsequent chapters. It provides some indication of the equipment used, as Stainton mentions a sweeping net (the most commonly used instrument at this time), while his friend Douglas improvises with an umbrella. The 'worn' condition of the apparently useless moth that escaped Douglas on this occasion points to the necessity for acquiring insects in a pristine state, for aesthetic reasons, but also to ensure their scientific worth as a specimen from which the species could be discerned. Finally, Stainton's return to the pit a few days later demonstrates how a change in weather conditions had a considerable impact on the number of moths he encountered. As will be argued in chapters one and two, this variability in insect populations was a key factor in why the *Intelligencer* was required by entomologists.

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<sup>7</sup> Henry Tibbats Stainton to Robert McLachlan, 18th August 1866, Oxford, Oxford University Museum of Natural History, Robert McLachlan Correspondence, box 23 (Stainton Letters 1).

<sup>8</sup> *Intelligencer*, 5 (1858-59), p. 13.



**Figure I.1** Henry Tibbats Stainton. (Left) Carte de visite (date unknown), © Natural History Museum, London; (Right) *Entomologist's Monthly Magazine*, 29 (1893), frontispiece.

## Useless Moths

'Entomology is the study of insects; insects are living beings "fearfully and wonderfully made"; to be studied they must be collected and observed'.<sup>9</sup> Stainton defined his favoured subject thus. This thesis is not a history of entomology, but rather uses the subject as a way of examining the practices of natural history more generally. Nevertheless, it is worth briefly providing an account of insect collecting and entomology (which are not necessarily the same thing) in this period.

The popularity of natural history in the nineteenth century is well-documented, but worth reiterating.<sup>10</sup> Writing in 1855, a year before the *Intelligencer* began, Charles Kingsley noted that the devoted naturalist had once been a figure of contempt, a 'harmless enthusiast, who went "bug-hunting" simply because he had not the spirit to follow a fox!'. In the space of 'two generations', however, natural history had become

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<sup>9</sup> *Entomologist's Annual* (1856), p. 6.

<sup>10</sup> Two useful (albeit dated) surveys of the subject are: David Elliston Allen, *The Naturalist in Britain: A Social History* (London: Allen Lane, 1976); Lynn Barber, *The Heyday of Natural History, 1820-1870* (London: Jonathan Cape, 1980). More recent and fine-grained scholarship will be discussed below.

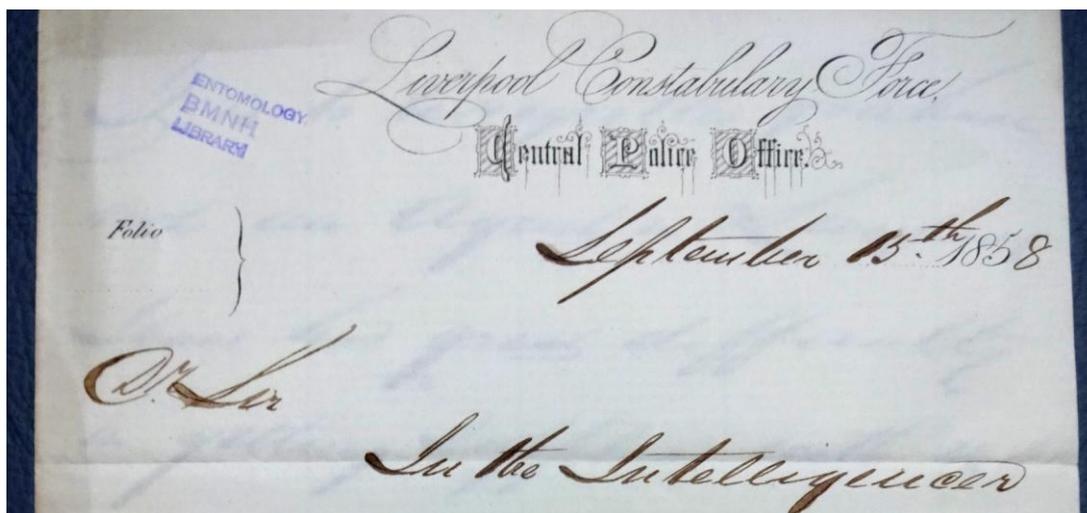
'honourable'. In fact, 'more than honourable', it was now fashionable: 'every well-educated person is eager to know something at least of the wonderful organic forms which surround him'. Kingsley provides the following humorous sketch to illustrate the fascination exercised by natural history to a surprising variety of people.

Do not you, the London merchant, recollect how but last summer your douce and portly head-clerk was seized by two keepers in the act of wandering in Epping Forest at dead of night, with a dark lantern, a jar of strange sweet compound, and innumerable pocketfuls of pill-boxes; and found it very difficult to make either captors or you believe that he was neither going to burn wheat-ricks, nor poison pheasants, but simply 'sugaring the trees for moths', as a blameless entomologist? And when, in self-justification, he took you to his house in Islington, and showed you the glazed and corked drawers full of delicate insects, which had evidently cost him in the collecting the spare hours of many busy years, and many a pound, too, out of his small salary, were you not puzzled to make out what spell there could be in those 'useless' moths, to draw out of his warm bed, twenty miles down the Eastern Counties Railway, and into the damp forest like a deer-stealer, a sober white headed Tim Linkinwater like him, your very best man of business, given to the reading of Scotch political economy, and gifted with peculiarly clear notions on the currency question?<sup>11</sup>

As will become clear in the following chapters, this is it not a caricature. Kingsley's language is heavily gendered, which reflects the greater visibility of male naturalists that will become apparent in subsequent chapters, but both men and women from a variety of backgrounds were highly active in the pursuit of insects, heading out into the woods and fields in search of their quarry. Thomas Galliers, a police station clerk from Liverpool, wrote to Stainton in August 1858 to describe 'a beetle I captured when flying near the Dingle Wood about this time last year', presumably meaning that the insect rather than the correspondent himself was airborne at the time. The letter is written on official police stationery, bearing a printed header of the Liverpool Constabulary Force, and we can only assume that this was not an approved use of such paper. Another note from Galliers (fig. I.2) enquires about the 'frequent reference' made in the *Intelligencer*

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<sup>11</sup> Charles Kingsley, *Glaucus; or, the Wonders of the Shore* (Cambridge: Macmillan, 1855), p. 4-6. Tim Linkinwater is the Cheeryble brothers' loyal clerk in Charles Dickens' *Nicholas Nickleby* (1839).



**Figure I.2** Thomas Galliers to H. T. Stainton, 15th September 1858, London, Natural History Museum, H. T. Stainton Correspondence from British Entomologists (MSS STA E 118:118), STAINT 36:118.

to Stainton's *Manual of British Butterflies and Moths* (published in parts, 1857-59), suggesting that the clerk was a regular reader of the periodical. In his communication regarding the flying beetle, dated 13th August 1858, Galliers begins 'in your number for July 10th. [18]58 you very properly give coleopterists a strong hint'. This refers back to an editorial in which Stainton urged beetle-hunters to take detailed records of their captures and share these through the *Intelligencer*, as 'coleopterist readers' were 'appalled at the dearth of information it contains respecting the objects of their especial study'. Galliers' letter was therefore a direct response to the periodical, and enclosed a 'very rough drawing' (sadly no longer extant) of his insect, which he hoped Stainton might 'think worthwhile giving a representation of', possibly 'in the shape of a woodcut in the *Intelligencer*'. 'I think so fine a specimen might gratify your readers and oblige yours truly'.<sup>12</sup>

Unfortunately for the police clerk, it would seem his beetle was not considered of great enough interest to warrant publication. Illustrations of any kind were rare in the *Intelligencer*, presumably in the interests of keeping production costs to a minimum. This did not discourage Galliers from further correspondence, and notices signed by him can be found in later issues of the *Intelligencer*. In 1862, a year after Stainton discontinued his weekly periodical, Galliers had a letter published in the monthly

<sup>12</sup> Thomas Galliers to H. T. Stainton, 13th August 1858, London, Natural History Museum, H. T. Stainton Correspondence from British Entomologists (MSS STA E 118:118), STAINT 36:118; Galliers to Stainton, 15th September 1858, STAINT 36:118; *Intelligencer*, 4 (1858), p. 113.

*Zoologist*, suggesting that he continued to read and contribute to natural history periodicals.<sup>13</sup> Furthermore, although there is no record of Galliers himself ever experiencing an embarrassing brush with the law as faced by Kingsley's entomological head-clerk, this was by no means an uncommon experience among insect collectors. The *Intelligencer* and other periodicals provide evidence (detailed in chapter two) of various encounters between unfortunate lepidoptersists and wary gamekeepers who were often incredulous that such nocturnal excursions were not of a more nefarious purpose.

Children were also enthusiastic collectors of insects, and many who went on to acquire fame as naturalists began by bug-hunting in their youth. Thomas Blackburn, another key player in this thesis, wrote his first letter to the *Intelligencer* at the age of 14. Charles Darwin was an avid coleopterist whilst studying at Cambridge, and in later life vicariously experienced the same delights through his three sons. As he recounted to his cousin, William Darwin Fox, 'I am reminded of old days by my third Boy having just begun collecting Beetles, [...] - My blood boiled with old ardour when he caught a *Licinus*, – a prize unknown to me'.<sup>14</sup> Perhaps remembering his own joy at seeing his name in print for the first time, credited with the capture of a beetle in James Francis Stephen's *Illustrations of British Insects* (1828-46), Darwin wrote to the *Intelligencer* on behalf of his children: 'we three very young collectors have lately taken, in the parish of Down, six miles from Bromley, Kent, the following beetles', which was signed in the names of Francis, Leonard, and Horace Darwin. Francis would later fondly recall this incident in an edited collection of his father's correspondence.<sup>15</sup>

The interest in insects was spurred by a variety of impulses. Aesthetics played a large part, as butterflies and moths in particular were the most favoured by collectors. Unlike botany, which had more obvious practical applications in terms of medicine and agriculture, entomology often struggled to shake off a reputation for being an immature, eccentric, and ultimately pointless pursuit. William Kirby (1759-1850) and William Spence (1782-1860), foundational figures of British entomology, complained in their *Introduction* to the subject that 'an *entomologist* is synonymous with everything that is

<sup>13</sup> *Intelligencer*, 5 (1858-59), p. 85; *Intelligencer*, 8 (1860), p. 19; *Zoologist*, 20 (1862), pp. 8172-8173.

<sup>14</sup> Charles Darwin, 'To W. D. Fox 13th November [1858]', in *Correspondence of Charles Darwin: Volume 7, 1858-1859*, ed. by Frederick Burkhardt (Cambridge: Cambridge University Press, 1991), p. 196.

<sup>15</sup> *Intelligencer*, 6 (1859), p. 99; Francis Darwin (ed.), *Life and Letters of Charles Darwin*, 2nd edition, 3 vols (London: John Murray, 1887), II, p. 140.

futile and childish', and for any man to profess himself as such would 'signalise him only as an object of pity or contempt' in 'nine companies out of ten'.<sup>16</sup> Although this was written in 1815, before the Victorian heyday of natural history, these unwelcome associations clung on. Henry Walter Bates (1825-1892), who produced the first scientific account of mimicry in animals through a study of Amazonian insects, observed in 1863 that the 'study of butterflies - creatures selected as the types of airiness and frivolity - instead of being despised, will some day be valued as one of the most important branches of biological science'.<sup>17</sup> It was not until much later in the century, with the emergence of 'economic entomology', that the study of insects assumed a more dignified place among the sciences.<sup>18</sup>

Almost twenty years after Charles Kingsley first remarked upon the rise of natural history, he noted that 'it has become a popular and common pursuit', rather than being 'confined mainly to several scientific men, or mere collectors of shells, insects, and dried plants'. Furthermore, 'now, we have, in addition to amusing books on special subjects, serials on Natural History more or less profound, and suited to every kind of student and every grade of knowledge'.<sup>19</sup> These periodicals, and the people who read and contributed to them, form the subject of this thesis, which engages with a number of key strands in the historiography of nineteenth-century science and print. It is possible to identify four particular areas of study to which this thesis makes an original contribution: scientific practice, popular science, periodicals, and professionalisation. There is, of course, much overlap between these topics, but an approach that treats them as historiographical subsets will highlight the different questions they seek to address.

## **Practice**

Historians have paid increasing attention to scientific practice, producing many detailed studies of the skills and techniques employed in a variety of contexts. This thesis follows Jim Endersby's definition of 'practice' as 'the action of doing something' with the

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<sup>16</sup> William Kirby and William Spence, *An Introduction to Entomology: or Elements of the Natural History of Insects*, 4 vols (London: Longman et al, 1815-26), I, p. v-vi.

<sup>17</sup> Henry Walter Bates, *The Naturalist on the River Amazons*, 2 vols (London: John Murray, 1863), II, p. 346.

<sup>18</sup> J. F. M. Clarke, *Bugs and the Victorians* (New Haven: Yale University Press, 2009), pp. 187-215.

<sup>19</sup> Charles Kingsley, *Glaucois; or, the Wonders of the Shore*, 5th edition (London: Macmillan, 1873), p. 223.

added stipulation that 'this work or doing must involve tangible, material objects'.<sup>20</sup> For the great majority of those who were engaged in natural history during the nineteenth century, whether they were artisan naturalists or gentlemen of science like Stainton, the physical act of collecting, preserving, and classifying specimens was central to their experience. David Allen pioneered an approach to the history of nineteenth-century natural history in Britain that took into account the wider context of the period, highlighting the impact of developments such as the Industrial Revolution and the invention of the bicycle upon the ways naturalists practised.<sup>21</sup> Allen's work remains valuable, and has been influential on subsequent scholarship, but nevertheless there remains scope for further investigation that integrates more recent historiography. Therefore, this thesis examines four key practices - corresponding, collecting, classifying, and associating - with each forming the subject of a chapter. These practices (among others) have all been identified by Endersby as constitutive of nineteenth-century natural history, but the importance of periodicals is not fully recognised in his work. This thesis argues that reading and contributing to such publications was itself a fundamental practice of natural history during this period, and it is this common thread that unites each of the chapters into a whole. Jonathan Topham has argued that while historians have done much to advance our understanding of laboratory and fieldwork practices, the practice of reading has been unduly neglected. For the nineteenth century, 'dominated as it has been by the culture of print, such analysis has a key role to play in the cultural history of science'.<sup>22</sup> Given the wealth of material provided by Stainton's archive, much of which directly relates to the ways in which the correspondents interacted with the periodicals he edited, this thesis makes a significant contribution towards such an understanding of the period.

James Secord has called for 'more intensive study of the entire community of naturalists, from provincial collectors to the grand metropolitan savants', and although it is now over 30 years since this remark was published, considerable work remains to be done if this historiographical lacunae is to be filled.<sup>23</sup> A focus on practice allows us to recover the experience of a far greater range of naturalists from this period, and also provides us with a way to analyse how scientific communities were constructed. As

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<sup>20</sup> Jim Endersby, *Imperial Nature: Joseph Hooker and the Practices of Victorian Science* (Chicago: University of Chicago Press, 2008), p. 6.

<sup>21</sup> Allen, *Naturalist in Britain*.

<sup>22</sup> Jonathan Topham, 'A View from the Industrial Age', *Isis*, 95 (2004), 431-442 (p. 442).

<sup>23</sup> James Secord, 'Natural History in Depth', *Social Studies of Science*, 15 (1985), 181-200 (p. 183).

each chapter of this thesis demonstrates, questions of practice were key to the fashioning of identities among those who engaged in natural history. Whether someone was considered to be a member of a community, or excluded from it, largely depended on criteria relating to that individual's practice, and if it conformed to the standards prescribed by that community. Anne Secord's work on the practices of artisan botanists in early nineteenth-century Lancashire has demonstrated the rich possibilities of such an analysis.<sup>24</sup> This thesis adopts a similar approach, looking beyond elite practitioners in order to reveal a wider range of sites and participants. Furthermore, by focussing on the second half of the nineteenth century, it builds upon Secord's work by permitting both continuity and change to be traced over a longer period. The remarkable expansion of the periodical press from the 1850s onwards, and the consequent impact on the circulation of knowledge, is the crucial development that distinguishes this study from previous work.

Through a focus on communicative practices, this thesis deals with 'knowledge in transit', taking on the phrase coined by James Secord in his polemical survey of the field. A central tenet of this approach involves 'eradicating the distinction between the making and communicating of knowledge', conceptualising science itself as a 'form of communication.' Knowledge is produced in the very act of circulation, rather than created within a localised context and transmitted outwards. As Secord argues, 'every local situation has within it connections with possibilities for interaction with other settings', and a study focussed on communication 'opens up the possibility of integrating accounts of technical, specialist aspects of science with their wider uses'. Through a dual focus on practice and periodicals, this thesis adopts such an approach. Secord identified the 'history of scientific periodicals, journalism, and book production after about 1850' as an area requiring considerably more attention, and although others have since begun to remedy the deficit, this thesis nevertheless represents an important contribution to our understanding of this subject.<sup>25</sup>

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<sup>24</sup> Anne Secord, 'Artisan Botanists: Science as Popular Culture in Nineteenth-Century England' (unpublished doctoral thesis, University of London, 2002); —, 'Corresponding Interests: Artisans and Gentlemen in Nineteenth-Century Natural History', *British Journal for the History of Science*, 27 (1994), 383-408; —, 'Science in the Pub: Artisan Botanists in Early Nineteenth-Century Lancashire', *History of Science*, 32 (1994), 269-315.

<sup>25</sup> James Secord, 'Knowledge in Transit', *Isis*, 95 (2004), 654-672.

## Popular Science

This thesis builds on the growing body of scholarship relating to 'popular science' - and the popularisation of science - in Britain during the nineteenth century. James Secord, Bernard Lightman, and Ralph O'Connor have all produced work that broadens our understanding of this topic, pointing to the ways in which science was reformulated by and for different audiences during this period.<sup>26</sup> However, there remains considerable disagreement as to whether 'popular science' is a useful category for historical analysis. It has now become an historiographical commonplace that scientific knowledge is not disseminated via a top-down process, from elite practitioners to a wider public, and it is needless to 'subject the poor old diffusion model to yet another bloodless ritual disembowelling' (as graphically phrased by Ralph O'Connor).<sup>27</sup> Both Jonathan Topham and James Secord have advised the abandonment of 'popular science' as a 'neutral descriptive term', only to be used as an actor's category. Instead, a focus on communicative practices is suggested in order to collapse the false, implied division between 'popular' and 'proper' science.<sup>28</sup> On the other hand, Ralph O'Connor argues that the term remains useful as an 'umbrella-category', or a 'low-resolution' analytical tool when considering the *longue durée*.<sup>29</sup> This thesis favours the former approach, as a greater degree of sensitivity is required towards the competing notions and uses of the term 'popular' in the second half of the nineteenth century.

In 'remapping' the 'topography of nineteenth-century British science', Lightman has drawn attention to the popularisers of science whose complex relationship to the professionalising practitioners reveals that such identities remained fluid during this period. As will become apparent, Stainton and many other actors in this thesis cannot easily be classed among either of these two groups. Although he became an established

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<sup>26</sup> James Secord, *Victorian Sensation: The Extraordinary Publication, Reception, and Secret Authorship of Vestiges of the Natural History of Creation* (Chicago: University of Chicago Press, 2001); Bernard Lightman, *Victorian Popularizers of Science: Designing Nature for New Audiences* (Chicago: University of Chicago Press, 2007); Ralph O'Connor, *The Earth on Show: Fossils and the Poetics of Popular Science, 1802-1856* (Chicago: University of Chicago Press, 2007).

<sup>27</sup> Ralph O'Connor, 'Reflections on Popular Science in Britain: Genres, Categories, and Historians', *Isis*, 100 (2009), 333-345 (p. 345).

<sup>28</sup> J. Secord, 'Knowledge in Transit', pp. 670-671; Jonathan Topham, 'Beyond the Common Context': The Production and Reading of the Bridgewater Treatises', *Isis*, 89 (1998), 233-262; —, 'Scientific Publishing and the Reading of Science in Nineteenth-Century Britain: A Historiographical Survey and Guide to Sources', *Studies in History and Philosophy of Science*, 31 (2000), 559-612; —, 'Rethinking the History of Science Popularization/Popular Science', in *Popularizing Science and Technology in the European Periphery, 1800-2000*, ed. by Faidra Papanelopoulou, Agustí Nieto-Galan, and Enrique Perdiguero (Aldershot: Ashgate, 2009), pp. 1-20.

<sup>29</sup> O'Connor, 'Reflections on Popular Science in Britain'.

figure within the same metropolitan circles as the X Club, was friends with John Lubbock, and knew T. H. Huxley well enough to be addressed as 'My Dear Stainton' in correspondence, he was not among the coterie of scientific naturalists.<sup>30</sup> To borrow Lightman's cartographic metaphor, this thesis will add another feature to what is becoming an increasingly detailed chart of a landscape more varied than previously conceived.

There have been several attempts to reformulate 'popular science' as a more useful category with regards to the nineteenth century. James Secord has recommended 'commercial science' as a more appropriate term, and more recent scholarship has considered the nineteenth-century British public as consumers of science (whilst avoiding the implications of audience passivity this might engender).<sup>31</sup> However, Lightman has contended that Secord's term does not adequately account for the many complex motives of those who sought to popularize science in this period.<sup>32</sup> Stainton's aim was not profit, never making more money from his periodicals than was necessary for them to be sustainable. In an article that continues to be regularly referenced by historians of nineteenth-century science, Susan Sheets-Pyenson suggested 'low science' as a 'more comprehensive term' than 'popular science', with the latter being a subset of 'low science' in which 'high science' is rendered 'intelligible to the non-scientist'. What characterised 'low science' periodicals was the attempt to 'establish their own canons of scientific investigation, criticism, and explanation'.<sup>33</sup> More recent scholarship has perpetuated Sheets-Pyenson's usage, and 'low science' (sometimes used interchangeably with other terms such as 'ethno-science' or 'vernacular science') is still used to denote 'an expectation of being involved in the creation of new knowledge'.<sup>34</sup> While Sheets-Pyenson's analysis may hold true for the French context that forms the basis of her comparative study, with regards to natural history in nineteenth-century Britain it is deeply problematic and requiring of revision. It may appear simple to draw a distinction between the 'high' science of the metropolitan learned societies and the 'low' science of

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<sup>30</sup> John Lubbock's letters to H. T. Stainton, STAIN 64:118; T. H. Huxley's letters to H. T. Stainton, STAIN 48:118.

<sup>31</sup> J. Secord, *Victorian Sensation*, p. 437; Aileen Fyfe and Bernard Lightman (eds), *Science in the Marketplace: Nineteenth-Century Sites and Experiences* (Chicago: University of Chicago Press, 2007).

<sup>32</sup> Lightman, *Victorian Popularizers*, p. 10.

<sup>33</sup> Susan Sheets-Pyenson, 'Popular Science Periodicals in Paris and London: The Emergence of a Low Scientific Culture, 1820-1875', *Annals of Science*, 42 (1985), 549-572 (p. 551).

<sup>34</sup> For example: Aileen Fyfe and Bernard Lightman, 'Science in the Marketplace: An Introduction', in *Science in the Marketplace: Nineteenth Century Sites and Experiences*, ed. by Aileen Fyfe and Bernard Lightman, (Chicago: University of Chicago Press, 2007), pp. 1-19 (p. 4).

working-class naturalists, but periodicals such as the *Intelligencer* demonstrate that there are no such stable boundaries between the two. Furthermore, a focus on practice and the circulation of knowledge serves to break down any such distinction. This thesis thereby re-evaluates the 'popular' natural history periodicals surveyed by Sheets-Pyenson's seminal work.

In seeking to identify 'imbalances' in the scholarship on popular science, Andreas Daum has contended that the predominant focus on nineteenth-century Britain has given rise to a misleading impression that these accounts are somehow globally representative, thereby eliding significant differences with other linguistic and cultural settings such as the United States, Germany, France, or India.<sup>35</sup> It must be acknowledged that this thesis does not redress the disparity, but it nevertheless indicates that a considerable amount of work remains to be done within the more limited scope of Britain, and its approaches and conclusions can provide a template for comparative studies on a more international scale. Stainton was a figure embedded within European as well as British science, despite entomology being a field prone to parochialism at this time. Around a third of the letters held in Stainton's archive are from correspondents beyond the shores of Britain (mostly Europe), as are a significant portion of his specimens. The multilingual text of the *Natural History of the Tineina* further emphasises this transnational aspect to his practice. Given the focus of this thesis is upon communication and the transit of knowledge, there is potential for a more expansive study to build upon its findings. Daum points to another imbalance, which this thesis addresses more effectively. Previous studies have focussed on the 'epistemological barriers' between practitioners of science and the general public, thereby 'perpetuating the very notion of a scientific community - as if its members were not, at the same time, always members of multiple communities'.<sup>36</sup> This thesis serves to break down this false distinction, as the periodicals examined served to blur any such differentiation between practitioners and public. Each periodical represented a different kind of scientific community with a distinct identity, but as will become apparent, the grounds on which each identified itself as 'scientific' could vary greatly.

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<sup>35</sup> Andreas Daum, 'Varieties of Popular Science and the Transformations of Public Knowledge: Some Historical Reflections', *Isis*, 100 (2009) 319-332 (pp. 322-327).

<sup>36</sup> *Ibid.*, p. 323.

Jonathan Topham has called for a 'rethinking' of popular science, drawing particular attention to the ways in which this term is employed 'in organising people in relation to the scientific exercise - situating people within a hierarchy of competence and both excluding people and including people from the scientific project'.<sup>37</sup> This thesis will argue that periodicals were a key site for engagement with science, offering opportunities for an array of individuals to take an active part in the production of scientific knowledge. Many of these publications explicitly describe themselves as 'popular', while others choose to distance themselves from any such implication. Therefore, periodicals played a vital role in the emergent and competing concepts of 'popular' science, and the role that should be taken by those variously (and problematically) labelled as 'amateurs' or 'lay' practitioners.

## Periodicals

There has been considerable work done on science in more general nineteenth-century periodicals. The *Science in the Nineteenth-Century Periodical* project and its numerous scholarly outputs has done much to advance our understanding of how the reading public of this period consumed and shaped scientific content through a wide variety of magazines such as the *Cornhill*, *Punch*, the *Boy's Own Paper*, and cheap miscellanies.<sup>38</sup> Furthermore, the work of Aileen Fyfe has provided an excellent account of how advances in printing technology drastically reduced the cost of producing books and periodicals, and expanding transportation and communications networks greatly increased the speed of distribution. Fyfe also explores the implications of this upon the ways in which knowledge was circulated, with scientific content reaching new audiences.<sup>39</sup> What remains to be researched in far greater detail are the considerable number of periodicals dedicated exclusively to scientific subjects, both those aimed at a popular audience and more specialised publications.<sup>40</sup> These formed part of the same

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<sup>37</sup> Topham, 'Rethinking the History of Science Popularization/Popular Science', p. 20.

<sup>38</sup> Geoffrey Cantor, Gowan Dawson, et al. (eds), *Science in the Nineteenth-Century Periodical: Reading the Magazine of Nature* (Cambridge: Cambridge University Press, 2004); Geoffrey Cantor and Sally Shuttleworth (eds), *Science Serialized: Representations of the Sciences in Nineteenth-Century Periodicals* (Cambridge, Mass.: MIT Press, 2004).

<sup>39</sup> Aileen Fyfe, *Steam-Powered Knowledge: William Chambers and the Business of Publishing, 1820-1860* (Chicago: University of Chicago Press, 2012).

<sup>40</sup> A small body of work already exists: Susan Sheets-Pyenson, 'From the North to Red Lion Court: the Creation and Early Years of the *Annals of Natural History*', *Archives of Natural History*, 10 (1981), 221-249; —, 'A Measure of Success: the Publication of Natural History Journals in Early Victorian Britain', *Publishing History*, 9 (1981), 21-36; —, 'Darwin's Data: His Reading of Natural History Journals, 1837-1842', *Journal of the History of Biology*, 14 (1981), 231-248; W. H. Brock, 'The Development of Commercial Science Journals in Victorian Britain', in *Developments of Science Publishing in Europe*, ed.

print market occupied by the more general publications, and this thesis will therefore contribute both to our understanding of scientific communication in this period, and nineteenth-century print culture in a wider sense.

The *Intelligencer* in particular has received scant attention from historians. David Allen has written on the economics of producing 'specialist' periodicals - that is, those dedicated to particular branches of natural history - in the first half of the nineteenth century. Allen identifies the *Intelligencer* as among the first to overcome the financial precarity that had hindered previous attempts to maintain such publications, pointing to the falling price of paper and cost-reductions affected by the abolition of Stamp Duty in 1855, but his analysis does not go beyond this.<sup>41</sup> Popular science periodicals are the subject of Susan Sheets-Pyenson's work on 'low scientific culture' of the nineteenth century, but she does not include the *Intelligencer* among her appendix of popular science periodicals, which must be considered an oversight. As already discussed, Sheets-Pyenson's concept of 'low' science is in need of reconsideration, but nevertheless her work remains an important touchstone in discussing the 'ideology of amateur participation' that was a defining characteristic of many English periodicals, with natural history being a subject that favoured such an approach.<sup>42</sup>

Melinda Baldwin's examination of *Nature* shows how periodicals can act as a medium through which scientific practitioners 'define what science is and what it means to be a scientist'.<sup>43</sup> This thesis adopts a similar approach, demonstrating how various natural history periodicals created communities, and also how those communities shaped the periodicals. Despite her omission of the *Intelligencer*, Sheets-Pyenson points to Edward Newman - printer of Stainton's weekly periodical and a respected entomologist in his own right - as representative of a 'broadly-based scientific community'. Sheets-Pyenson argues the 1860s were a turning point in this trend, with a

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by A. J. Meadows (Amsterdam, New York, and Oxford: Elsevier Science Publishers, 1980), pp. 95-122; Jean G. Shaw, 'Patterns of Journal Publication in Scientific Natural History from 1800 to 1939', *ibid.*, pp. 149-176; W. H. Brock and A. J. Meadows, *The Lamp of Learning: Two Centuries of Publishing at Taylor & Francis* (London: Taylor & Francis, 1984). For more recent scholarship, see: Aileen Fyfe, Julie McDougall-Waters, and Noah Moxham (eds), *Notes and Records* (special issue: '350 Years of Scientific Periodicals'), 69 (September 2015); Sally Shuttleworth and Berris Charnley (eds), *Notes and Records* (special issue: 'Science Periodicals in the Nineteenth and Twenty-First Centuries'), 70 (December 2016).

<sup>41</sup> David Elliston Allen, 'The Struggle for Specialist Journals: Natural History in the British Periodicals Market in the First Half of the Nineteenth Century', *Archives of Natural History*, 23 (1996), 107-123 (p. 118).

<sup>42</sup> Sheets-Pyenson, 'Popular Science Periodicals', p. 562.

<sup>43</sup> Melinda Baldwin, *Making Nature: The History of a Scientific Journal* (Chicago: University of Chicago Press, 2015), pp. 5-6.

new generation of professionals attempting to 'mould the Republic of Science's amateur practitioners into sympathetic supporters' rather than active participants.<sup>44</sup> Newman is a key figure in this thesis, but it is the attitudes of others towards him that prove more revealing. In the 1860s, Stainton and the other leading entomologists who established the *Entomologist's Monthly Magazine* were scathing in their opinions of Newman, in stark contrast to the close collaboration of the previous decade. However, this was not the reaction of professionals to an 'amateur' interloper, but rather the opinion of other non-professional men of science such as Stainton and other influential members of the Entomological Society of London. Tracing the underlying reasons for this realignment of a scientific community reveals a more complex account of how new identities were formed during this period. This further develops arguments made by Ruth Barton, who also concurs that the 1860s - just before the advent of the journal *Nature* in 1869 - saw a significant change in forms of scientific journalism.<sup>45</sup> More recently, Bernard Lightman has stated that 'participatory ideal' identified by Sheets-Pyenson 'continued into the 1860s, 1870s, and 1880s, shaped by new developments in Victorian publishing, politics, culture and society'.<sup>46</sup> Lightman's study is a brief one, however, and this thesis undertakes a more detailed study of these changes.

With regards to geology in the 1830s, Martin Rudwick maps practitioners onto a 'gradient of attributed competence', arguing that 'scientific status was primarily expressed in terms of the *competence* of any individual geologist to deliver reliable information or ideas of specific kinds'. This model places 'elites' (the most competent) at the centre and 'amateurs' (the least competent) in the outermost zone. Rudwick has also suggested that similar 'topographies' could be drawn for other sciences in this period, with considerable overlap where certain practitioners operated in more than one field.<sup>47</sup> While this method is useful for analysing how knowledge claims were judged, particularly with reference to the geological controversies among 'gentlemanly specialists' that Rudwick is concerned with, we must be aware of how such attributions of skill and expertise were contested throughout the nineteenth century. Once again,

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<sup>44</sup> Sheets-Pyenson, 'Popular Science Periodicals', p. 562.

<sup>45</sup> Ruth Barton, 'Just Before *Nature*: The Purposes of Science and the Purposes of Popularisation in some English Popular Science Journals of the 1860s', *Annals of Science*, 55 (1998), 1-33.

<sup>46</sup> Bernard Lightman, 'Popularizers, Participation and the Transformations of Nineteenth-Century Publishing: From the 1860s to the 1880s', *Notes and Records*, 70 (2016), 343-359 (p. 355).

<sup>47</sup> Martin Rudwick, *The Great Devonian Controversy: The Shaping of Scientific Knowledge Among Gentlemanly Specialists* (Chicago: University of Chicago Press, 1985), pp. 418-426; —, 'Charles Darwin in London: The Integration of Public and Private Science', *Isis*, 73 (1982), 186-206 (p. 190).

Edward Newman is a figure who defies categorisation, as his position upon such a 'map' at any given time would vary depending on which periodicals you read. Although the *Entomologist's Monthly Magazine* carried considerable influence, it was by no means the sole arbiter of scientific worth within entomology. Each publication advanced different criteria of competence, largely defined by the editors, but also influenced by the readers. Furthermore, Rudwick's largely unqualified use of the term 'amateur' is problematic. The topography of the 1860s and beyond is further complicated by the emergence of professional practitioners.

### **Amateurs and Professionals**

Mary Terrall describes eighteenth-century natural history as 'extensive and multifaceted, and practised by such a wide variety of people around the globe, that it could hardly be considered a discipline'.<sup>48</sup> However, historians widely agree that the nineteenth century saw increased professionalisation within the life sciences, and a concomitant growth in institutions, standardisation, and specialism. In Britain, T. H. Huxley and his fellow members of the X-Club are often invoked as the primary driving force behind this move, seeking to establish science as a viable career and imbue it with cultural authority, leading to the marginalisation of 'amateurs' in the practice of science. However, more recent scholarship has questioned such a narrative, pointing to the many complications it elides. Part of the problem, as Samuel Alberti asserts, is the treatment of 'professionalisation as a historiographical meta-narrative', when in fact it was a 'historically and geographically contingent endeavour'.<sup>49</sup> J. F. M. Clarke's *Bugs and the Victorians* traces the emergence of professional entomology in the nineteenth century, driven by economic and imperial imperatives.<sup>50</sup> Jim Endersby has critiqued the historiographical framing of Clarke's work, suggesting that such an account of professionalisation is teleological, failing to address the 'delicate and protracted negotiations' through which 'professional' and 'amateur' became distinct.<sup>51</sup> In response, this thesis provides a more nuanced account of how identities and scientific communities shifted and adapted over the course of this period.

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<sup>48</sup> Mary Terrall, *Catching Nature in the Act: Réamur and the Practice of Natural History in the Eighteenth Century* (Chicago: University of Chicago Press, 2014), p. 2.

<sup>49</sup> Samuel Alberti, 'Amateurs and Professionals in One County: Biology and Natural History in Late Victorian Yorkshire', *Journal of the History of Biology*, 34 (2001), 115-147 (p. 141).

<sup>50</sup> Clarke, *Bugs and the Victorians*, pp. 187-215.

<sup>51</sup> Jim Endersby, 'Review of *Bugs and the Victorians*', *Reviews in History*, <http://www.history.ac.uk/reviews/review/924> [accessed 2nd May 2017].

The complex relationship between emergent professionals and more established gentlemen of science has been discussed by both Ruth Barton and Jim Endersby.<sup>52</sup> Likewise, Adrian Desmond has shown how the X-Club's ideology had far more to do with the 'Liberal context and Dissenting relevance of the new sciences' than the 'twentieth-century "professional" norm'.<sup>53</sup> John Lubbock - a banker, politician, and entomologist (in that order) - was an 'amateur' member of the X-Club, suggesting that professional qualifications were less important than other factors, such as an individual's adherence to scientific naturalism. Furthermore, Joseph Dalton Hooker, a man who held a professional scientific post at Kew gardens, was at pains to present himself as a 'philosophical' botanist rather than a salaried worker. Clearly the identities we now ascribe to the amateur/professional divide were in a state of flux in this period, and require closer attention. The above examples are drawn from a small, albeit incredibly influential number of elite practitioners, and this thesis deals with those who operated outside of this select coterie.

Closely associated with narratives of professionalisation in the life sciences during the nineteenth century is the attendant rise of biology, as distinct from the older mode of natural history. Lynn K. Nyhart's account of the 'biological perspective' in mid to late nineteenth-century Germany points to its roots in popular natural history rather than professional practitioners, and a similar study of the British context is required.<sup>54</sup> This thesis certainly touches upon these subjects, but does not attempt to offer anything like such a comprehensive narrative. Its primary concern is with natural history, but it would be misleading to suggest a strict dichotomy between biology and its supposed antecedent. Once again, a focus on communicative practices suggests that there is no such clear distinction. Shorn of its theoretical and ideological trappings, and instead considered with regards to conventions of circulation, late nineteenth-century biology should not be viewed as differing too greatly from the more antiquated forms of natural history it has been purported to supersede.

At this point it is necessary for a brief discussion of terminology, as this relates to the historiography on professionalisation. Any study of popular participation in science

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<sup>52</sup> Ruth Barton, "'Huxley, Lubbock, and Half a Dozen Others': Professionals and Gentlemen in the Formation of the X Club, 1851-1864', *Isis*, 89 (1998), 410-444; Endersby, *Imperial Nature*, pp. 249-275.

<sup>53</sup> Adrian Desmond, 'Redefining the X Axis: "Professionals", "Amateurs", and the Making of Mid-Victorian Biology: A Progress Report', *Journal of the History of Biology*, 34 (2001), 3-50.

<sup>54</sup> Lynn K. Nyhart, *Modern Nature: The Emergence of the Biological Perspective in Germany* (Chicago: University of Chicago Press, 2009).

during this period must contend with the vexed issue of how to define the varied persons who engaged in such activity, both individually and collectively. The word 'scientist' would be an anachronism in almost all cases, and although its usage grew towards the end of the period, it remained a much-contested term well into the twentieth century.<sup>55</sup> Subsequently, 'man of science' is the preferred term to denote Stainton and others like him, who dedicated a considerable amount of their time to science without holding a salaried position.<sup>56</sup> However, this leaves a great deal unaccounted for. Of course, the obvious gendering of such a phrase precludes the many women who practised natural history. Due to the focus on periodicals, this thesis is unfortunately unable to recover the work of these numerous individuals, as the *Intelligencer* in particular, and many of the other publications discussed, are very much lacking in female contributors. Even among the men who produced the majority of the periodicals' content, there is enough variety to defy easy categorisation. They were clerks, like Thomas Galliers, but also civil servants, clergymen, doctors, handloom weavers, cutlers, and plumbers. All pursued natural history in the leisure hours outside of their working lives.

The range of personal circumstances represented by these individuals makes any collective descriptor problematic, as considerable differences in social class alone point to a gulf in experience between (for example) a rural parish vicar and an urban factory worker. Many studies invoke the term 'amateur', seeking to distinguish these individuals from professionals, but such a definition is problematic. In discussing the role of 'amateur' botanists in nineteenth-century America, Elizabeth Keeney attempted to provide a more sensitive designation, asserting that motivation is the 'key litmus test for the botanical community of the nineteenth century'. According to her formulation, professionals were those who 'acted to advance or further science', while amateurs 'sought enrichment for themselves' and 'were not dependent on scientific employment for a livelihood'.<sup>57</sup> While Keeney is right to emphasise the importance of motivation, such a neat division is far too simplistic for the purposes of this thesis (and the study of nineteenth-century Britain in general), and is easily refuted. Once again, the figure of

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<sup>55</sup> Baldwin, *Making Nature*, pp. 4-8.

<sup>56</sup> Paul White, *Thomas Huxley: Making the 'Man of Science'* (Cambridge: Cambridge University Press, 2003); —, 'The Man of Science', in *A Companion to the History of Science*, ed. by Bernard Lightman (Chichester: John Wiley, 2016), pp. 153-163.

<sup>57</sup> Elizabeth Keeney, *The Botanizers: Amateur Scientists in Nineteenth-Century America* (Chapel Hill: University of North Carolina Press, 1994), p. 6.

Stainton straddles these two definitions, pursuing scientific discovery without earning a livelihood from it. Furthermore, the motivations for historical actors are notoriously difficult to recover, with a considerable gap between personal rationale and publicly stated aims. Any reading of such evidence must be undertaken with a strong degree of caution.

The term 'amateur' can retain usefulness when employed within a strictly defined context, as in Samuel Alberti's work on the life sciences in late nineteenth-century Yorkshire, where newly professionalised biologists sought to construct an identity distinct from that of the apparently less rigorous amateurs of natural history. As Alberti points out, 'amateur roles and identities were culturally and locally contingent'.<sup>58</sup> Consequently, employing 'amateur' as a blanket definition across the period, and across Britain, is highly problematic. Men such as Charles Darwin and Stainton can both be classed as amateurs in the strictest sense, in that they never held salaried positions. They were men of independent wealth, embedded within an established scientific community that centred on the clubbability of metropolitan learned societies. The second half of the nineteenth century may have seen a decline in such 'gentleman amateurs', but the continued existence and influence of these individuals well into the twentieth century cannot be denied, particularly in entomology. The example of the banker-zoologist Walter Rothschild amply demonstrates that wealth and patronage remained a significant factor in natural history.<sup>59</sup>

This thesis adopts a deeply contextualised approach to the question of amateurs and professionals, paying close heed to the terms employed by historical actors. This follows the approach taken by Ruth Barton, who analysed the 'language of self-description' in order to show that the distinction between amateurs and professionals was not considered to be important.<sup>60</sup> Consequently, the chapters that deal with the *Intelligencer* and the 1850s do not commonly use these terms, as it was not a distinction recognised by Stainton and his fellow entomologists at this time. Only from the 1860s onwards does the term 'amateur' become more widely employed, as it was now necessary to distinguish such individuals from the emergent cadre of professional

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<sup>58</sup> Alberti, 'Amateurs and Professionals', p. 117.

<sup>59</sup> Kristin Johnson, *Ordering Life: Karl Jordan and the Naturalist Tradition* (Baltimore: John Hopkins University Press, 2012), pp. 40-73.

<sup>60</sup> Ruth Barton, 'Men of Science': Language, Identity, and Professionalization in the Mid-Victorian Scientific Community', *History of Science*, 41 (2003), 73-119.

practitioners, though the unstable nature of such identities during this period mean that its use is irregular rather than commonplace. It is also possible to trace an increase in the more pejorative use of the term, as professional identity could be constructed in opposition to a perception (often inaccurate) of the amateur as a dilettante who lacked scientific rigour.<sup>61</sup> For the reasons outlined above, it is necessary to avoid using the term indiscriminately, only deploying it within certain limits.

It is almost impossible to entirely avoid the use of ahistorical terminology, as some form of short-hand is necessary if we are not to be lost in a mire of obfuscatory qualifications. Chosen carefully, and clearly defined, these need not be misleading. Therefore, the word 'practitioner' operates as a useful term to denote any individual who engaged in the practices of natural history. It is less value-laden than 'amateur', and more importantly, can be applied both to professionals and non-professionals in the nineteenth century. Although modern usage of 'practitioner' tends to be associated with professionals, particularly in medicine or law, it is not intended to carry such an implication here.<sup>62</sup> Bernard Lightman has similarly employed this term to signify 'those who are engaged in conducting experiments or analysing the natural world', as opposed to the 'popularisers' who wrote about the natural world.<sup>63</sup> For the purposes of this thesis, the definition is taken more simply to mean someone who is engaged in scientific practice - which includes reading and writing - as this incorporates all the individuals who were participating in natural history through the practices discussed. This is something they each held in common, and what served to bind them together as a community - or in some cases, to distinguish one community from another. It allows them to be collectively referred to, whilst permitting nuance regarding their differences. Through a more careful use of such language, this thesis calls for a reconsideration of how such terms are employed in future scholarship.

## Sources and Methodology

The *Entomologist's Weekly Intelligencer* forms the basis of a detailed case study in the first half of this thesis (chapters one and two), building up a detailed portrait of the community who engaged with this periodical. Focussing on a single periodical over a

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<sup>61</sup> Alberti, 'Amateurs and Professionals'.

<sup>62</sup> 'practitioner, n.', *OED Online*, (Oxford: Oxford University Press, 2017), <http://www.oed.com.ezproxy3.lib.le.ac.uk/view/Entry/149242?redirectedFrom=practitioner#eid> [accessed 9th September 2017].

<sup>63</sup> Lightman, *Victorian Popularizers*, p. 13.

relatively short timeframe allows for a snapshot of a particular set of practitioners, which can then serve as a basis for comparison over the following chapters (three and four). The second half of this thesis is more wide-ranging, considering a number of different periodicals over a longer stretch of time. As much of the material relates to Henry Tibbats Stainton, his career provides a useful narrative framework on which to base a study of natural history and periodicals in the second half of the nineteenth century. The 1850s are an appropriate place to start, not simply because it is a natural mid-point, but rather because this decade saw the beginning of key developments. The first issue of the *Intelligencer* was published in 1856, a year after the abolition of Stamp Duty paved the way for a boom in periodical production in subsequent decades.

Ending this study in the 1890s is justified for a number of reasons, aside from Stainton's death in 1892. The landscape of popular science, of publishing, and of natural history had altered considerably since the 1850s, and this thesis will trace those changes. This is not to suggest, however, that certain trends did not continue into the twentieth century, and a more extensive study would be required to follow these threads. However, the end of Stainton's life coincides with an important shift within his own field of entomology. As discussed by J. F. M. Clarke, the early 1890s saw a coup by the new breed of 'philosophical biologists', who for the first time attained leadership of the Entomological Society of London. Previously, this eminent position had been the sole preserve of an older form of naturalist - the classifier - more concerned with the determination of species than the physiological aspects of the creatures they studied.<sup>64</sup> In a similar vein, the appointment of Edward Bagnall Poulton (1856-1943), an evolutionary biologist, as Hope Professor of Zoology (effectively entomology) at Oxford in 1893 represents another significant change. The previous incumbent of this position, John Obadiah Westwood (1805-93), had remained resolute in his dismissal of Darwin's theories until his death. As already stated, we should be wary of suggesting that biology entirely supplanted natural history in this period, or that such a sharp distinction can be drawn between the two approaches, but nevertheless there is a sense that the 1890s saw a definite shift.

Chapters one to three all draw extensively on Stainton's correspondence archive, reading these letters alongside periodicals. In very few cases does such a comprehensive archive relating to a periodical and its editor remain extant, which severely curtails our

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<sup>64</sup> Clarke, *Bugs and the Victorians*, pp. 105-131.

understanding of its production. Stainton's correspondence archive is a rich source that favours a number of fruitful approaches. In much the same manner as the Charles Darwin and John Tyndall correspondence projects, it allows us to embed Stainton within the various networks and communities to which he and his correspondents belonged, providing key context for the analysis. This contributes to what Janet Browne has dubbed 'correspondence history'.<sup>65</sup> It gives us insight into what was not published, in addition to what Stainton put into print. However, the Stainton correspondence collection consists almost entirely of letters received by him, so in most cases it has been impossible to read both sides of an exchange. In a select number of instances, Stainton kept a copy of his reply, and these are included alongside the letter to which he was responding. Any such reference to a letter written by Stainton held in this particular archive can be assumed to be such a copy, unless stated otherwise. Although little is known regarding Stainton's personal habits of correspondence and archiving, it seems that these copies were made only in exceptional circumstances, perhaps when legal or other considerations made it a prudent course of action. Various Stainton letters exist in other correspondence collections, such as that of Charles Darwin, but given the wide range of Stainton's network, it seems likely that the vast bulk of the letters written by him do not remain extant. A notable exception to this are those contained in the archives of the Hope Entomological Collections, held at the Oxford University Museum of Natural History, addressed by Stainton to his close friend Robert McLachlan, and John Obadiah Westwood, the first Hope Professor of Zoology.

It is worth briefly outlining the nature of Stainton's correspondence archive, as this profoundly affected how the material could be approached. Given the sheer quantity of correspondence, and the lack of any catalogue or other guide to its contents, some selectivity has been exercised in the letters consulted. Although most of the collection is focused towards entomology, and a great deal relates to periodicals, the subject matter varies widely, with communications regarding all aspects of Stainton's life. The British letters (as opposed to the European) are organised in 118 numbered boxes, which are organised alphabetically according to the correspondent's surname. As a result, some boxes (and occasionally multiple boxes) are dedicated solely to a single correspondent (usually a close friend or colleague), and others contain a mix (for example, box no. 1

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<sup>65</sup> Janet Browne, 'Corresponding Naturalists', in *The Age of Scientific Naturalism: Tyndall and His Contemporaries*, ed. by Bernard Lightman and Michael S. Reidy (London: Pickering & Chatto, 2014), pp. 157-169 (pp. 159-160).

includes all correspondents whose name begins AB through to ANG). Inside each box, there is generally no discernible ordering principle, with letters sorted neither by date nor alphabetically. This does not lend itself to sampling techniques, and instead required a more targeted approach. Based upon a reading of the periodicals, key figures and collaborators were singled out as requiring investigation, with a particular focus on letters written around key dates. In recovering more marginal figures, the periodicals served as an excellent guide that permitted a range of contributors to be chosen for further examination. This approach rendered the material more manageable, whilst providing a representative cross-section.

This thesis also adopts the methods associated with book history, by which the materiality of the periodical and its production are considered. Again, Stainton's correspondence offers a particularly rich source for this approach, especially with regards to the *Entomologist's Monthly Magazine* (chapter three). In considering the practices of natural history, a place must be afforded for the periodical as a vital aspect of this. One of the primary arguments made by this thesis is that periodicals were a core component of the experience of doing natural history. Natural history periodicals come in a variety of forms, and this thesis takes into account these different types: a weekly, a monthly, entomological, natural history more generally, and publications produced by field clubs and societies. Furthermore, there is a clear link between the temporal sequencing of these publications and the scientific practices they related to - what James Secord refers to as the 'periodicity of knowledge'.<sup>66</sup> As chapter one argues, it is highly significant that Stainton believed a 'weekly newspaper' was necessary for entomologists, as the speed of communication was of paramount importance to collectors. Practice determined the kind of periodical that was required as much as the periodical informed practice. Chapter three illustrates how the *Entomologist's Monthly Magazine* differed from the *Weekly Intelligencer* in more ways than their titles would imply, with an attendant shift in the types of practices represented in their pages, and the kinds of practitioners who constituted their contributor-communities. Wherever possible, this thesis uncovers the lived experience of these individuals by tracing their interactions with the periodical as a text and an object.

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<sup>66</sup> J. Secord, 'Knowledge in Transit', p. 663.

## Chapter Outline

Each chapter is structured around a scientific single practice, and examines the ways in which natural history periodicals both informed, and were informed by, that practice. It is not intended to be an exhaustive account of the activities engaged in by naturalists during this period, but offers detailed treatments of four key practices. These are correspondence, collecting, classifying, and associating. The first three chapters proceed roughly in chronological order, from the 1850s to the 1890s, while the final chapter offers a survey of this whole period. The content of the chapters reflects this configuration, with one, two, and three being more self-contained case studies of particular periodicals, and the fourth being far more broadly conceived.

Chapter one examines the *Entomologist's Weekly Intelligencer*, setting it within the context of natural history print culture of the 1850s. It utilises Stainton's personal archive, revealing how readers and contributors engaged with the periodical, paying attention both to editorial intent and the more difficult question of how readers made use of the publication in the practices of natural history. The chapter demonstrates how Stainton consciously emulated the conventions of personal correspondence through the periodical in order to construct a scientific community of entomologists. It argues that the *Intelligencer* represented the application of nineteenth-century technologies to a far older, more established form of communication, described as the industrialisation of correspondence. The implications of this are explored, particularly the greater potential for wider participation in natural history. Among Stainton's professed aims was encouraging the pursuit of entomology among the working classes, and the *Intelligencer* played a vital role in this.

Chapter two remains with the *Intelligencer*, but switches its attention to the practice of collecting. This is an activity central to natural history, and this is reflected in the focus of many periodicals. The very *raison d'être* of Stainton's periodical was to provide collectors with week by week updates regarding which species were emerging as the season progressed, and making them aware of what information needed to be circulated. This is perhaps the most clear example of a periodical being directly informed by a scientific practice, but also of the periodical altering the fieldwork practices of its readers. Furthermore, this chapter turns to the subject of specimen exchange, which was mediated through the periodical. Building upon the previous chapter, it contends that by

permitting collectors to actively participate in the circulation of specimens, the *Intelligencer* enabled a more broadly construed scientific community to cohere. However, for the very same reason, anxiety and controversy regarding exactly who should be permitted to participate in the exchange of specimens demonstrate how the boundaries of this community were negotiated and enforced.

Chapter three begins with the end of the *Intelligencer* in 1861 - in part due to the controversy described in chapter two - and goes on to deal with the attempts made to fill the void it left. Drawing further on Stainton's correspondence, it centres around his collaborative efforts to establish the *Entomologist's Monthly Magazine* in 1864. Taking Stainton's death in 1892 as an endpoint allows us to trace the considerable changes that took place within natural history and scientific publishing over the course of these thirty years. As with chapter two, it traces attitudes to a particular practice - classifying, in this case - in order to understand how entomologists constructed identity. Disagreement over exactly who was a true 'entomologist' and who was merely a 'collector' often hinged on the practice of classifying, as this was the primary mode of 'scientific' entomology during this period. The chapter contends that the *Monthly Magazine* was a site for the construction of a more exclusive kind of scientific community, very different to that of the *Intelligencer*, and that classification was a means by which this elitism was maintained. A rival periodical, the *Entomologist*, serves as an instructive comparison to Stainton's new publication. The chapter concludes with the establishment of another periodical in 1890, the *Entomologist's Record and Journal of Variation*, which is representative of the biological turn entomology took in the closing decade of the nineteenth century. However, important continuities between the practices of the nascent discipline and the older form of natural history are made apparent. This provides a more nuanced account of the life sciences during this period, engaging with previously established narratives such as professionalisation and the emergence of biology as a distinct discipline.

Chapter four departs in some ways from the previous three chapters, as its focus is far less on Stainton and entomology. In discussing the practice of associating - that is, forming and participating in natural history societies - a broader scope is more appropriate, as this accounts for the ways in which the large majority of practitioners engaged in science through more general natural history periodicals and social gatherings. This chapter demonstrates how periodicals were produced by natural history

societies to serve a number of purposes, such as to publicise their work and to express a sense of regional identity, emphasising the entangled nature of associational science within mid to late nineteenth-century civic culture. Emphasis is placed on those periodicals which were intended to be read beyond the strict geographical limits of their production, as this has considerable implications for the way in which knowledge was circulated between local and national contexts, and for the means by which practitioners (both professional and non-professional) sought to fashion their identity at both levels. Furthermore, it argues that the same middle class, urban milieu of associational natural history of this period was a defining influence on the way in which periodicals sought to engage their readers with science. Given this chapter's wider context, both temporally and conceptually, it is necessarily more impressionistic than exhaustive, and intended to indicate where more detailed work could be undertaken in order to build upon the findings of this thesis.

Collectively, these chapters demonstrate the range of individuals who engaged in natural history during the second half of the nineteenth century, bringing to light their motives, attitudes, and their lived experience of practicing science in the field, at home, through writing, in print, and among their peers. They have been dismissed by some, both at the time and subsequently, as eccentric dilettantes who chased butterflies and amassed collections merely for their own amusement, but it will be made apparent that this is far from the case. Through periodicals, these individuals formed communities that shaped knowledge and understanding of the natural world.

## CHAPTER ONE

### Corresponding

In June 1860, Charles Darwin was thinking about moths. More specifically, he was pondering how British orchids were fertilised by the action of insects. He was familiar with the ways by which bees or butterflies, in feeding upon the nectar contained in flowers, carried pollen from plant to plant. In the wake of publishing the *Origin of Species* the previous year, he was particularly fascinated by how each species of orchid attracted a specific type of insect, as such a complex mutual relationship between animals and plants provided compelling evidence for his theories. However, a question remained regarding a number of orchid species, for which Darwin had been unable to identify the pollinator. Having noted that no diurnal (daytime flying) insect had visited the plants under his keen observation, he had come to the conclusion that 'moths are the priests which perform the marriage ceremony'. Rather than continue the laborious task of flower-watching himself, he turned to periodicals to provide him with an answer. He first wrote a letter to the *Gardener's Chronicle*, his preferred publication, but then forwarded the same notice to the *Entomologist's Weekly Intelligencer*. He noted that moths had on occasion been caught 'with pollen-masses adhering to them', and enquired 'if any entomologist reads this, and can remember positively having caught a moth thus furnished, I hope he will give its name, and describe exactly to which part of the moth's body the sticky gland adhered'.<sup>1</sup>

Janet Browne has observed that 'for some Victorians, a large-scale correspondence network constituted a scientific method'.<sup>2</sup> Darwin is among the best examples of this, with his far-reaching web of correspondents allowing him to collate information from the comfort of his study in Kent. Despite his own meticulous investigations and exhaustive knowledge, it was necessary for him to draw upon the expertise of others to furnish him with the wealth of data from which he drew his now-famous conclusions. Periodicals served as a logical extension of this, allowing him to tap into the specialised community of the *Intelligencer* and thereby explore beyond the reach of his personal correspondence. In a letter to Henry Tibbats Stainton, with whom Darwin was a cordial

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<sup>1</sup> *Entomologist's Weekly Intelligencer*, 8 (1860), pp. 93-94.

<sup>2</sup> Janet Browne, 'Corresponding Naturalists', in *The Age of Scientific Naturalism: Tyndall and His Contemporaries*, ed. by Bernard Lightman and Michael S. Reidy (London: Pickering & Chatto, 2014), pp. 157-169 (p. 158).

but infrequent correspondent, he thanked the former for publication of the above notice and remarked 'I have had a very satisfactory answer from Mr Parfitt, who is evidently a careful & conscientious observer'.<sup>3</sup> Parfitt was a self-made man of science who had begun life as a gardener before attaining the curatorship of a museum in Taunton, Somerset, and was regularly featured in the pages of the *Intelligencer*.<sup>4</sup> He also read the *Gardener's Chronicle*, as it was Darwin's notice in this publication to which Parfitt responded. Through periodicals, Parfitt was taking an active part in the circulation of scientific knowledge. Without such a publication, Parfitt's correspondence is likely to have been on a more limited scale, and it is quite possible Darwin would never have received an answer to his orchid query. The periodical, therefore, should itself be considered a form of scientific practice by which individuals participated within a wider scientific community.

Letter writing and the practices of natural history share a long and close association. Elizabeth Yale has shed light on the use of correspondence by early modern naturalists in conducting and communicating their researches, and how this manuscript culture related to the burgeoning print medium of the period.<sup>5</sup> Furthermore, one of the most famous and influential works of nature writing, Gilbert White's *Natural History and Antiquities of Selbourne* (1789), takes the form of letters sent by the parson-naturalist to his peers.<sup>6</sup> The title of the *Intelligencer* itself drew upon a long-standing tradition in scientific communication. In the seventeenth century, an 'intelligencer' was an individual possessed of an extensive international correspondence network, such as Henry Oldenburg, secretary of the Royal Society. Acting as 'information brokers', intelligencers served as intermediaries in the transmission of letters and broadcast information they deemed of interest to a wider community of practitioners. With the early modern national postage system far from efficient and international mail delivery unreliable at best, this was a vital function in the transit of knowledge. Furthermore, naturalists only required a single correspondent's address in order to participate.<sup>7</sup> The parallels with Stainton a few centuries later are clear, as his own voluminous

<sup>3</sup> Charles Darwin, 'To H. T. Stainton 20 June [1860]', in *Correspondence of Charles Darwin: Volume 8, 1860*, ed. by Frederick Burkhardt (Cambridge: Cambridge University Press, 1993), p. 263

<sup>4</sup> *Entomologist's Monthly Magazine*, 29 (1893), p. 73.

<sup>5</sup> Elizabeth Yale, *Sociable Knowledge: Natural History and the Nation in Early Modern Britain* (Philadelphia: University of Pennsylvania Press, 2016).

<sup>6</sup> Gilbert White, *The Natural History and Antiquities of Selbourne* (Oxford: Oxford University Press, 2016).

<sup>7</sup> Brian Campbell Vickery, *Scientific Communication in History* (Lanham: Scarecrow Press, 2000), pp. 69-72; Yale, *Sociable Knowledge*, pp. 65-66.

correspondence archive demonstrates that Stainton was himself a nineteenth-century intelligencer. His establishment of the *Intelligencer* strongly suggests that Stainton was fully self-conscious of this, and also shows the degree to which the periodical was considered a logical extension of the role. The *Intelligencer* performed this function far more efficiently than any single person could hope to achieve, refining rather than revolutionising an established method of scientific communication.

This chapter will draw on Stainton's correspondence in order to demonstrate the ways in which scientific knowledge was produced and transmitted through a network that was mediated through periodicals. Although many historians of science draw extensively upon correspondence, there have been far fewer studies of the practice of correspondence itself. Anne Secord and Jim Endersby have both made valuable contributions towards this, though the impact of periodicals on the process of correspondence remains largely unexplored.<sup>8</sup>

### **'An Extremely Wild-Goose Speculation'**

The first issue of the *Intelligencer* (fig. 1.1) arrived in the hands of entomologists on Saturday, 5th April 1856. It cost a single penny, a price that never varied throughout its publication. The advantages of such a periodical were not immediately obvious to some. The opening article was entitled 'why do entomologists want a weekly newspaper?', a question which Stainton answered as follows:

Those who discover a fact in the economy of insect-life don't like to keep their discovery to themselves till the end of the season, yet to write to each of their intimate correspondents [...] requires more time than they are disposed to spare; now each discoverer has but to write one full notice of his discovery and forward it to us, and in ten days, at the very outside, it is in print and in the hands of nearly every Entomologist in the kingdom.<sup>9</sup>

The *Intelligencer* effectively industrialised the process of scientific correspondence amongst entomologists, applying the rapidly developing technologies of print to an

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<sup>8</sup> Anne Secord, 'Corresponding Interests: Artisans and Gentlemen in Nineteenth-Century Natural History', *British Journal for the History of Science*, 27 (1994), 383-408; Jim Endersby, *Imperial Nature: Joseph Hooker and the Practices of Victorian Science* (Chicago: University of Chicago Press, 2008), pp. 84-111. Bernard Lightman briefly discusses the trials and tribulations of Richard Proctor's attempt to include correspondence in the journal *Knowledge*: Bernard Lightman, *Victorian Popularizers of Science: Designing Nature for New Audiences* (Chicago: University of Chicago Press, 2007), pp. 341-345.

<sup>9</sup> *Intelligencer*, 1 (1856), p. 1.

older form of communication. Rather than a single letter with one recipient, the *Intelligencer* reproduced each communication and thereby permitted rapid circulation of knowledge. A full-page advert for the periodical was included in a newly published book, *Practical Hints Respecting Moths and Butterflies* by Richard Shield, and this notice explained the *Intelligencer's* utility as follows:

No existing publication supplies this want; at present a rarity, caught on the 29th June, cannot be published till the 1st of August, when the information comes too late to be of use to others.<sup>10</sup>

All communications received by Wednesday were considered for inclusion in the issue of Saturday that same week, which was an unprecedented speed for communication on such a scale.<sup>11</sup> The *Intelligencer* fulfilled its projected purpose, at least in the opinion of the editor, who later asserted 'as an instantaneous *medium* of communication between Entomologists in all parts of the country it has proved most serviceable'.<sup>12</sup> Claims of instantaneity were an exaggeration, of course, but serve to emphasise the novelty of such rapidity.

As railway networks spread and became more efficient during this period, it was possible to ensure periodicals arrived at booksellers throughout the country, as evinced by the growing list of vendors included in many issues of the *Intelligencer*.<sup>13</sup> Following Stainton's death in 1892, the *British Naturalist* noted:

Just at the right moment, when extra postal facilities, and the extension of the railway system gave greater opportunities for the inter-communication among Entomologists, he [Stainton] brought out his *Entomologist's Annual* (1855), his *Manual of British Butterflies and Moths* (1856), and the *Entomologist Weekly Intelligence* [sic]. These gave the impetus wanting, and made Entomology what it is to-day.<sup>14</sup>

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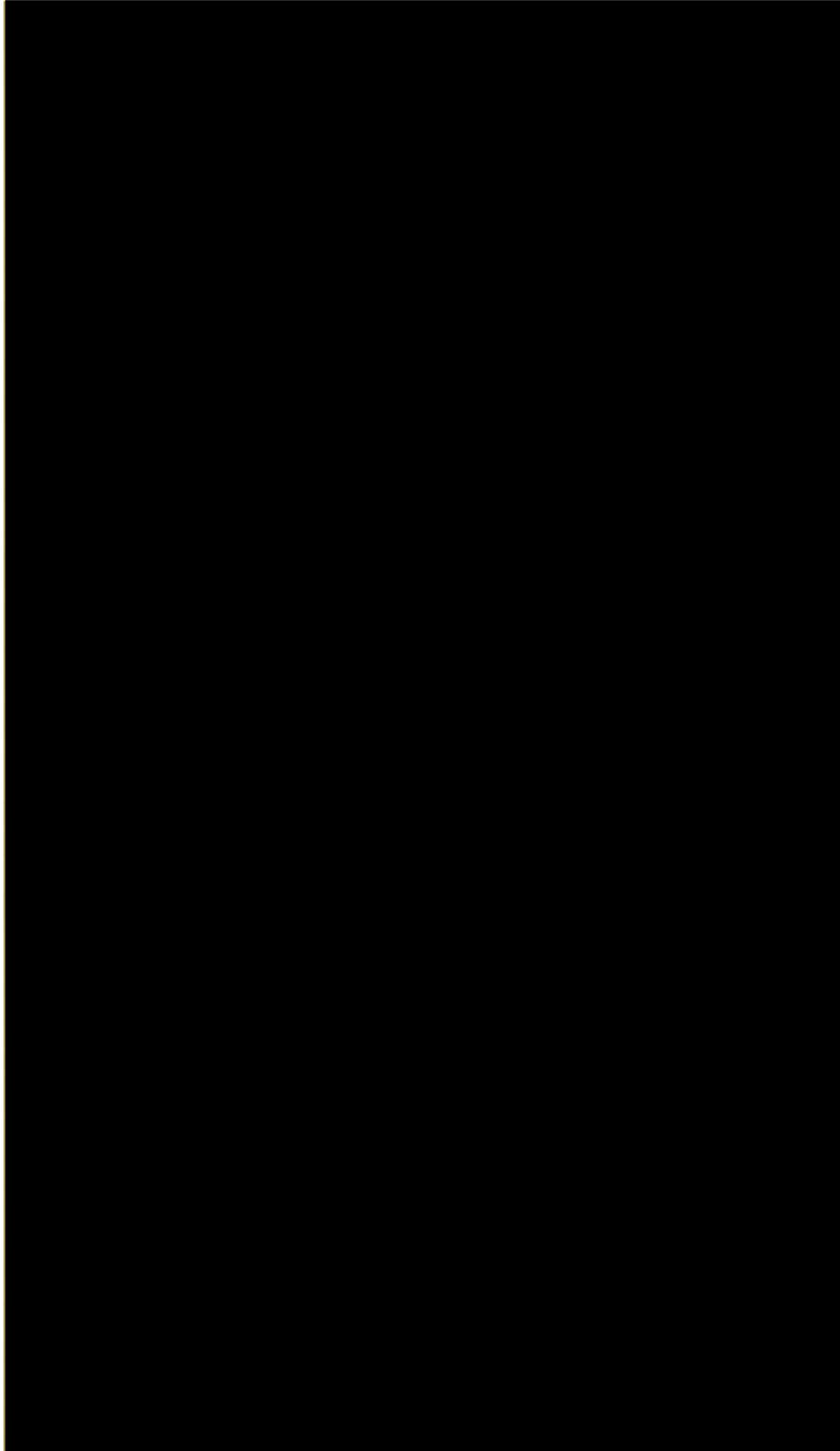
<sup>10</sup> Richard Shield, *Practical Hints Regarding Moths and Butterflies, with Notices of their Localities* (London: John Van Voorst, 1856), inside rear cover.

<sup>11</sup> *Intelligencer*, 1 (1856), p. 18.

<sup>12</sup> *Entomologist's Annual* (1857), p. 173.

<sup>13</sup> For a detailed overview of the changes in periodical distribution, see: Graham Law, 'Distribution', in *The Routledge Handbook to Nineteenth-Century British Periodical and Newspapers*, ed. by Alexis Easley, Andrew King, and John Morton (London: Taylor & Francis, 2016), pp. 42-59.

<sup>14</sup> *British Naturalist*, 3 (1893-94), p. 18.



**Figure 1.1** *Entomologist's Weekly Intelligencer*, 1 (1856), p. 1. The layout of the front page varied little throughout its existence.

Chief among the 'extra postal facilities' was the introduction of the Uniform Penny Post in 1840, which is a key development in the industrialisation of correspondence. As the title suggests, this reform set the cost of sending a single letter at one penny, paid in advance and irrespective of distance, thus rendering it much more affordable. Previously, the responsibility of payment was usually placed upon those receiving the letter, with prepayment by the sender 'often considered an indirect social slur'.<sup>15</sup> In 1839, the year before the reform was passed, an estimated 76 million letters were delivered in the United Kingdom. By 1856, the year the *Intelligencer* began publication, this figure had risen to around 478 million.<sup>16</sup> Catherine Golden characterises this as a 'revolution in letter writing'.<sup>17</sup> The advent of the Penny Post must be considered a key factor in facilitating periodicals that relied on correspondence for their content. The sheer volume of letters circulated in response to these publications would have been considerably more limited by a more expensive and less efficient postal service.

The huge increase in periodicals during the second half of the nineteenth century can be attributed to a number of concurrent factors. The 1830s through to the 1850s saw significant developments in the manufacture of paper and the increased use of steam-driven presses. In addition to this, the 'taxes on knowledge' - duties levied on paper, advertising, and political content that sought to discourage radical publishers - were gradually reduced and eventually repealed altogether.<sup>18</sup> The *Intelligencer's* first publication in 1856, a year after the abolition of Newspaper Stamp Duty, is certainly no coincidence. In 1857, Stainton himself acknowledged that

It was by some considered an extremely wild-goose speculation to attempt to bring out a penny weekly journal in any degree scientific, and in good truth, a few years ago this would not have been practicable; but, thanks to Mr Milner Gibson and his colleagues, their endeavours to remove the taxes on knowledge, and their success in obtaining the repeal of the newspaper stamp and advertisement duty, have rendered that possible.

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<sup>15</sup> Catherine Golden, *Posting It: The Victorian Revolution in Letter Writing* (Gainesville: University Press of Florida, 2009), p. 43.

<sup>16</sup> *Third Report of the Postmaster General on the Post Office* (London: 1857), p. 36.

<sup>17</sup> Golden, *Posting It*, pp. 43-112.

<sup>18</sup> Aileen Fyfe, *Science and Salvation: Evangelical Popular Science Publishing in Victorian Britain* (Chicago: University of Chicago Press, 2004), pp. 45-46.

Stainton accurately predicted the repeal of paper duty, the final 'foe to education and civilization', which occurred in 1861.<sup>19</sup> 'Mr [Thomas] Milner Gibson' was a politician who played a leading role in these reforms. The *Intelligencer* can therefore be seen as a product of a number of significant developments during this period, all of which contributed to make the process of 'industrialising' correspondence possible. To borrow a phrase from Aileen Fyfe, it became 'steam-powered knowledge'.<sup>20</sup>

Stainton's correspondence archive is voluminous and diverse, containing letters relating to almost every aspect of his life. Through them, we are able to draw a fascinating portrait of a gentleman of science and much of his daily existence. It is possible to reconstruct the communities in which he conducted his various scientific endeavours and the complex networks of which he formed a part. A great proportion of them do relate to entomology in some respect, but these are interleaved with notes to and from the company who (incorrectly) fitted a new fireplace in his home; a begging letter received (and politely refused) from Charles Carter Blake, erstwhile secretary of the controversial Anthropological Society; and correspondence regarding his various philanthropic interests in the local workhouse and other charitable institutions. The letters that can be classed as 'scientific' are equally wide-ranging. Over 2,000 of the estimated 14,000 items are between Stainton and European entomologists - Stainton learned German in order to correspond with Philipp Christoph Zeller and others. His British correspondents were varied, ranging from working-class collectors to the most eminent naturalists of the period. It stands testament to the variety of those who cultivated natural history during the nineteenth century, and this in turn is translated into the pages of the *Intelligencer*.

### **The Anatomy of a Periodical**

Each single issue of the *Intelligencer*, consisting of eight pages printed in two columns, was devoted almost entirely to correspondence. Published on a Saturday, a typical issue of the *Intelligencer* followed a reasonably predictable format, though there was some variation over the course of its existence, and even from week to week depending on circumstances. There was no cover, simply the title emblazoned at the head of the first page, which also featured a short leading article written by Stainton. This is where his

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<sup>19</sup> *Entomologist's Annual* (1857), p. 174.

<sup>20</sup> Aileen Fyfe, *Steam-Powered Knowledge: William Chambers and the Business of Publishing, 1820-1860* (Chicago: University of Chicago Press, 2012).

editorial voice was most evident, and he utilised this space to address his readers on a wide range of subjects, making his opinions known and attempting to shape those of others. The tone ranged from gently humorous and whimsical to more serious, occasionally outright angry. For example, the second issue asked 'Why did Mr Westwood get the Royal Medal?'. The entomologist John Obadiah Westwood had received this prestigious award from the Royal Society in 1855, and whilst Stainton did not dispute that the prize was deserved, he questioned why the field of entomology had not previously been honoured thus.<sup>21</sup> These editorials played a key role in shaping the community of the *Intelligencer*, as he addressed his readership as a whole, emphasising cohesion and familiarity.

The bulk of each issue was taken up with 'Communications'. These were sometimes no more than a sentence or two, and generally no more than a paragraph, each headed with a short title to indicate their subject. Exactly what warranted publication and what did not was very much down to Stainton's personal judgement. Most commonly, a correspondent would announce the capture of a particular insect. If this were a rare species, or had been found to occur in a location or habitat previously unrecorded, then the interest in such news was much greater. Unlike other natural history journals of the period, the focus of the *Intelligencer* was very much on the fieldwork practices of its correspondents. Rather than presenting long treatises on a new species, it more simply gave a practical account of where and how the insect had been captured. One correspondent, A. Wallace of Clerkenwell (not Alfred Russel Wallace, who was in the Malay archipelago at the time), wrote to the *Intelligencer* expressing his opinion on why such information was useful:

The whole question of collecting lies in a nut-shell: it is the old game of 'How, when and where?' Answer these three questions with reference to any one insect, and then the right man in the right place, at the right time, is sure to realize, - viz. let Mr Samuel Stephens go down to West Wickham the first fortnight in May. The result is self-evident: *Carmelita* is taken, eggs; larvae obtained; our cabinets supplied.

To this end, more than the insect itself must be collected, as the information relating to its capture is of great importance. The entomologist should note 'where he went, the

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<sup>21</sup> *Intelligencer*, 1 (1856), pp. 9-10.

name of the capture, and whether by sugar, light, flight or their capture as larva or pupa, [...] the condition of the wind, weather, whether cold or warm, dry or wet.' The date was of particular importance, as 'many insects appear true to time, from year to year, even on the same day'.<sup>22</sup> The reference to Mr Stephens is most likely a misspelling of Samuel Stevens, the noted natural history agent and keen entomological collector. His business on Bloomsbury Street in London sold ready-prepared microscopic slides, in addition to exotic specimens collected by men such as Alfred Russel Wallace and Henry Walter Bates.<sup>23</sup> It is not clear from the above note whether Stevens would have sold or exchanged the specimens he collected himself, but nevertheless it demonstrates why the sharing of such information was useful to a wider community of collectors. Furthermore, the *Intelligencer* increasingly became a forum for the exchange of specimens themselves, as much as information. This process is the subject of the next chapter, but suffice to say that such transactions were mediated through the periodical via advertisements. Those with 'duplicates' (surplus specimens of a single species) in their collection made this known to the other readers, who then applied directly to the correspondent to initiate the exchange.

Aside from the correspondence, remaining pages of the *Intelligencer* were filled in a variety of ways. Stainton often found room for longer letters or articles from correspondents, particularly if controversy arose over some aspect of entomological practice. Exchange was a particular bone of contention, as will be examined in the second chapter. As will become clear over the course of this thesis, the editor was even-handed in his treatment of those who disagreed with him, not shying from publishing the views of those who contradicted his own opinions or those of his friends. The very last page of each issue of the *Intelligencer* usually contained advertisements for books on entomology, sometimes those written by Stainton himself, and frequently the works of his numerous friends and peers. The periodical was therefore situated within a wider commercial print culture of natural history, and must be considered in this context.

### **'Cutting My Own Throat'**

The *Intelligencer* formed part of a complex network of natural history publishing in London. It was printed and published by Edward Newman (1801-76, fig. 1.2), another renowned entomologist, periodical editor, author of numerous books and articles, and a

<sup>22</sup> *Intelligencer*, 5 (1858-59), p. 166.

<sup>23</sup> Stevens' obituaries: *Zoologist*, 3 (4th series, 1899), p. 479; *Entomologist*, 32 (1899), p. 264.

close friend of Stainton.<sup>24</sup> They saw each other frequently at meetings of the Entomological Society of London, and presumably were regular visitors at each other's homes, as suggested by a letter dated 26th November 1857. Newman accidentally left 'a pair of entomological spectacles' at Stainton's, and requested his friend return them should he 'have to come to town'.<sup>25</sup> The son of a Quaker manufacturer of morocco leather, Newman lacked the inherited wealth that sustained Stainton. After a brief stint in the rope business, Newman took over the printing company of George Luxford (1807-54), who produced the *Magazine of Natural History*. In addition to printing, Newman edited the monthly *Zoologist* (1843-1916), a 'popular miscellany of natural history' that enjoyed a remarkably long lifespan, surviving him by forty years. Newman had previously conducted two other monthlies, the *Entomological Magazine* (1833-38) and the *Entomologist* (1840-42). As is made clear by their titles, both these periodicals were devoted solely to the study of insects. The *Entomologist* was subsumed by the more broadly construed *Zoologist* in 1843.<sup>26</sup> Furthermore, Newman established and managed (but did not edit) another monthly periodical, the *Phytologist* (1841-54), a 'popular botanical miscellany'. Another key player in this network was the publisher John Van Voorst (1804-98), whose company specialised in works on natural history, including those of such luminaries as Richard Owen. Van Voorst published the *Zoologist* (up to 1886), the *Entomologist*, the *Phytologist*, both Stainton and Newman's own books, and the *Entomologist's Annual*. He also acted as a retailer for the *Intelligencer* from his premises on Paternoster Row.<sup>27</sup>

Periodicals and seriality were embedded in the print culture of natural history at this time. It is worth noting here that just as the novels of Charles Dickens or William Makepeace Thackeray were issued in monthly parts, Van Voorst adopted a similar publishing strategy for the scientific works he published. Gowan Dawson has written on Richard Owen's self-conscious use of this serial mode. Owen's *History of British Fossil Mammals and Birds* (1846), published by John Van Voorst, was released in bimonthly numbers, with the author sometimes finalising proofs only a day or two before they went to print. This had a number of advantages, allowing for last minute corrections in

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<sup>24</sup> T. P. Newman, *Memoir of the Life and Works of Edward Newman* (London: John Van Voorst, 1876). See also: Susan Sheets-Pyenson, 'Popular Science Periodicals in Paris and London: The Emergence of a Low Scientific Culture, 1820-1875', *Annals of Science*, 42 (1985), 549-572 (p. 561).

<sup>25</sup> Edward Newman to H. T. Stainton, 26th November 1857, London, Natural History Museum, H. T. Stainton Correspondence from British Entomologists (MSS STA E 118:118), STAIN 78:118.

<sup>26</sup> *Entomologist*, 1 (1840-42). Newman would later revive this periodical in 1864 (see chapter three).

<sup>27</sup> *Intelligencer*, 1 (1856), p. 42.

light of ongoing discoveries, and also keeping the reader in suspense as the scientific narrative unfolded. Furthermore, Dawson points to Owen's hope that serialised numbers would prove more affordable to 'those who cooperate in the progress of Palaeontology by collecting and preserving the Fossil Remains of Mammals and Birds'.<sup>28</sup> Stainton adopted a very similar strategy when he came to publish his *Manual of British Butterflies and Moths*, produced in monthly numbers by Van Voorst between 1856 and 1859. The aim of the book was to supply 'for a low price, the greatest possible amount of information likely to be useful to beginners'.<sup>29</sup> The very first issue of the *Intelligencer* contained a notice advertising the second number at the price of 3d (or 'post free 4d').<sup>30</sup> As with palaeontology, the advancement of entomology was reliant on a great number of collectors across the country. Despite the intense labour of producing the *Manual*, it was Stainton's sincere hope that the completed book would 'tend to render itself incomplete, as, by increasing the number of students of Lepidoptera, it must facilitate the discovery of new species'. Upon its conclusion, Stainton observed in the *Intelligencer*:

We are aware that a large number of our readers have had their copies of the *Manual* interleaved, and no doubt they will insert on the blank pages the notices of the new species which will appear from time to time in the *Annual* or in our own pages.<sup>31</sup>

This is an excellent illustration of how a periodical such as the *Intelligencer* was utilised by practicing entomologists as a 'paper technology'. Any work on entomology was likely to become similarly outdated, given the rate at which new observations and discoveries were being made at this time, and the continued wrangling over systems of classification. The periodical, therefore, offered the most effective way of keeping track of such developments. Although most periodicals cease publication at some point, they are a form that is inherently unfinalised. In much the same way, science is an ongoing process with no predefined end, making the serial an ideal mode of publication. However, the practices of publishing in parts and interleaving show that we should be

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<sup>28</sup> Gowan Dawson, 'Paleontology in Parts: Richard Owen, William John Broderip, and the Serialisation of Science in Early Victorian Britain', *Isis*, 103 (2012), 637-667 (pp. 662-665); Richard Owen, *History of British Fossil Mammals and Birds* (London: John Van Voorst, 1846), p. viii.

<sup>29</sup> Henry Tibbats Stainton, *Manual of British Butterflies and Moths*, 2 vols (London: John Van Voorst, 1856-59), I, p. iii.

<sup>30</sup> *Intelligencer*, 1 (1856), p. 8.

<sup>31</sup> *Intelligencer*, 6 (1859), p. 105.

wary of considering the book as a fixed medium by contrast, and points to a conjunction of different print forms in the making of scientific knowledge.

Newman was at first a little sceptical that another periodical was needed, as he believed the *Zoologist* fulfilled all the functions Stainton claimed for the *Intelligencer*. Newman's periodical had hitherto been the place where captures and discoveries had been announced, though its monthly publication slowed the speed at which this news was transmitted, making the *Weekly Intelligencer* a threatening rival in the market. Despite his reservations, however, Newman wrote to Stainton promising to

Stitch the advertisement [for the *Intelligencer*] in the *Zoologist* although I am well aware it is what is technically called 'cutting my own throat' for I am thoroughly aware how the *Intelligencer* will interfere with the sale of the *Zoologist*.



**Figure 1.2** Edward Newman. Photograph by Maull and Polyblank (date unknown). © Wellcome Library, London.

In return for this selfless act of commercial suicide, Newman requested that Stainton 'stitch up the enclosed advertisement in the next number of the *Manual [of British Butterflies and Moths]*'.<sup>32</sup> The advertisement referred to is not extant, but was probably for the *Zoologist*, or possibly one of Newman's numerous books. The *Zoologist* was clearly equal to the challenge of the *Intelligencer*, and indeed any of the considerable number of rival natural history periodicals that sprang up over the next half century and beyond. While on the subject of financial considerations, it is worth noting that Stainton and the *Intelligencer* were largely above such concerns. Although 'the circulation was not sufficiently extensive [at least in 1857] to make the sale at a penny remunerative', fully bound volumes were made available at the cost of nine shillings each to ensure 'the loss [to Stainton] would be *nil*, or nearly so'.<sup>33</sup> Unlike Newman, whose livelihood rested upon a business, Stainton was not concerned about turning a profit. His personal fortune allowed him to afford a degree of loss, which he presumably considered a price worth paying if entomology was significantly advanced by such an enterprise. This chimes with Stainton's noted philanthropic disposition, and sets the *Intelligencer* apart from many natural history periodicals whose utility to science was contingent on their commercial viability. Newman's *Phytologist*, in contrast to the *Zoologist*, 'never was successful' as a 'speculation' and consequently folded.<sup>34</sup>

### **'Mothology Made Easy'**

Stainton's opinion of the *Zoologist*, as given in a review of entomological literature in the *Entomologist's Annual* of 1856, sheds light on why he considered the *Intelligencer* to be necessary. Of the three monthly periodicals published at that time, he describes the *Annals and Magazine of Natural History* as 'a *learned* periodical, and by no means intelligible to the multitude'. On the other hand, the *Naturalist* (edited by Beverley R. Morris and not to be confused with the journal of the same name later established by the Yorkshire Naturalists' Union) was '*popular*' and 'extensively read by the *unlearned*'. Indeed, 'a little more learning would not be a disadvantage', as Stainton considered this periodical to be 'a useful one', but cautioned his readers 'not to believe everything' it printed. The *Zoologist* he characterised thus:

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<sup>32</sup> Newman to Stainton, 19th October 1855, STAINT 78:118.

<sup>33</sup> *Entomologist's Annual* (1857), p. 173.

<sup>34</sup> *Phytologist*, 5 (1854), p. vi.

*Popular and learned*; at least, it tries to combine the two. Insensibly I believe this periodical has become more *learned* than formerly, and is found too abstruse by incipients; communications from new naturalists now growing up are hardly welcomed as cordially as they ought to be.<sup>35</sup>

The distinction drawn here by Stainton is a significant one, as it reveals the perceived differences in the audiences for natural history at this time, and strongly suggests what he wished to achieve with the *Intelligencer*. The apparent divide between 'popular' and 'learned' was debated by Stainton and Newman. The latter bemoaned at the commencement of the *Zoologist* that 'the attempt to combine scientific truths with readable English, has been considered by my friends as one of surpassing rashness', having received many 'supplications to introduce a few Latin descriptions, just to give the work a scientific character'.<sup>36</sup> In compiling proofs of Stainton's influential *Manual of British Butterflies and Moths*, printed by Newman (and published by Van Voorst), there was the issue of italics used for scientific names. Newman made his views plain:

Italics, I do not like them: [...] they always seem to me to render a book forbidding: the *Athenaeum* says 'hateful italics' the *Gardener's Chronicle* wrote the other day of laying down a book 'warned by the number of ominous italics': I never use them because they terrify a beginner: & that they always obscure the meaning and disfigure the page no one will gainsay.<sup>37</sup>

This concern for beginners echoes Stainton's views on the *Zoologist*, which he considered to be an unwelcoming place for budding entomologists to enter. Italics and Latin aside, the difference in price between Newman's periodical and the *Intelligencer* is also significant in this respect. The cost of the *Zoologist* was a shilling per month, three times the price of four issues of the penny-a-week *Intelligencer* purchased within a similar timeframe. This is an expense many of the so-called 'unlearned' could not have afforded, necessarily limiting its effectiveness as a 'popular' periodical.

The difficult task Stainton set himself with the *Intelligencer* was to create a periodical that could genuinely be both 'popular' and 'learned'. That is, to be a publication easily intelligible to beginners and those lacking in specialist knowledge,

<sup>35</sup> *Entomologist's Annual* (1856), p. 169.

<sup>36</sup> *Zoologist*, 1 (1843), p. v.

<sup>37</sup> Newman to Stainton, 6th October 1855, STAIN 78:118.

but also to satisfy the demands of scientific rigour. This he believed had been achieved, and took doubters to task:

Yet in spite of all we have said or written on this subject, there still exist people so stupid as to maintain that scientific books should be adapted only to the capacities of those who are already scientific, and should not be partially adapted to the capacity of the unlearned, with the view of tempting them to move forward in a scientific direction. Every reader found in the *Intelligencer* something he could understand and appreciate.<sup>38</sup>

What exactly is meant by 'scientific' or 'learned' is perhaps best understood by the example of the *Transactions of the Entomological Society of London*. The volume for the years 1856-58, the first few years of the *Intelligencer's* existence, give a reasonably representative sample of the kind of work produced by the foremost British society for the study of insects at this time. The majority of the papers included therein have titles including the word 'Description' and 'Observations', concerned with the classification of new species or genera, usually accompanied by detailed (and expensive) coloured plates depicting the specimens in question. The very first memoir is by John Obadiah Westwood, 'Descriptions of the Species of the Australian Lamellicorn Genus *Cryptodus*'.<sup>39</sup> The prose is awash with Latin phrases, giving a minute and detailed account of insect specimens, pointing to the often miniscule variations that differentiate one species from another. It is impenetrable for a beginner, but also of little interest to a practising collector in the field, who would perhaps be more concerned with how the insect was captured (laying aside the obvious point that it is an Australian insect, and therefore not a species met with anywhere in Britain).

The *Intelligencer* was not an unrivalled success in this respect, however, as there remained ongoing debate within its pages as to the possible exclusion of the unlearned. One correspondent from Honley in West Yorkshire, W. C. Buckley, stated:

I happen to be acquainted with about twenty entomologists in my immediate neighbourhood and only one out of the number knows anything of Latin names; therefore they can neither receive nor give information on the subject. [...] I have no doubt that we are taking insects commonly here that

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<sup>38</sup> *Entomologist's Annual* (1857), p. 173.

<sup>39</sup> *Transactions of the Entomological Society of London*, 4 (new series, 1856-1858), p. 1.

are rare in some places did we understand entomological language. I hope you will in some way or other try to remove the obstacle that lies in the way of the unclassical entomologist.<sup>40</sup>

The barriers that separated 'learned' and 'unlearned', classical and 'unclassical', were therefore not abstract constructs in the minds of Stainton and Newman, but very real and considerable obstacles faced by some collectors of insects who wished to make a contribution to science.

However, Stainton did not believe in the use of English names to facilitate what he described as 'mothology made easy'. Certain species (not just of insects) could be known by a range of vernacular names in different localities, so it is quite possible that an entomologist in Lancashire and another from Kent could use very different names for the same kind of butterfly. Therefore, 'those who collect insects, and who do not wish to be utterly isolated, must learn to call them by names by which other people will know them'.<sup>41</sup> He further justified this in the *Intelligencer*, describing how thousands of insects 'go by no other name in ordinary conversation than *a* moth, *a* bee, *a* beetle', but 'all the species have had scientific names given them'. Stainton argued:

Many insects are so much alike that one needs to be a tolerably skilled Entomologist in order to tell them apart, and the person who is clever enough to know one from the other is clever enough to talk of them by the Latin names.<sup>42</sup>

Stainton's conception of 'popular' science was not simply a version of 'learned' science rendered intelligible to the non-practitioner, but rather one that attempted not to exclude incipients at the point of entry. His aim was not at an undifferentiated mass public, but rather at those who might be drawn into the practice of natural history if given the right encouragement.

In addition to the stumbling-block of Latin terminology, there were a number of factors limiting the inclusivity of a periodical such as the *Intelligencer*. There is the obvious preclusion of all those unable to read and write from direct participation in the correspondence carried out within its pages. Furthermore, it is worth noting at this point

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<sup>40</sup> *Intelligencer*, 1 (1856), p. 156.

<sup>41</sup> Stainton, *Manual*, I, p. iv.

<sup>42</sup> *Intelligencer*, 1 (1856), pp. 58-59.

that the correspondents to the *Intelligencer* were almost exclusively male. In the few places where a woman's name can be found, she is almost invariably married and referred to in a letter written by her husband, even if she had captured the insect. In June 1858, Mr J. P. Duncan, from Troon on the west coast of Scotland, reported that

Mrs Duncan captured, yesterday afternoon, a fine female specimen of what I conceive to be *Micra ostrina*. In examining a clump of thistle on the sand hills it started up, and she gave it pursuit; twice it alighted, and having nothing but a small pill-box to take it with, it was at last secured.<sup>43</sup>

This notice suggests a number of things. It seems Mrs Duncan was involved in fieldwork, paying greater attention to thistles than if she had simply been out walking. Furthermore, she carried a pill-box - if nothing else - a standard piece of entomological equipment for retaining captured insects. However, it was Mr Duncan who identified the specimen, and he who wrote the letter to the *Intelligencer*. Mrs Duncan's individuality is elided, identified only by her husband's surname. Such women were not afforded agency by the periodical, as it was to their husbands that any further correspondence was addressed.

Stainton himself remarked upon the paucity of women corresponding directly with his periodical:

Until a female will make herself known her communication must remain unnoticed. Among our many valuable correspondents may be reckoned several eminent lady entomologists (who have furnished us with several useful hints), but it is not necessary that we should advertise their names and addresses, unless they wish it.<sup>44</sup>

This implies that Stainton had received letters from women wishing to be published in the *Intelligencer*, but who wished to do so anonymously, and therefore withheld the details of their identity. As a result, they could not be contacted by other readers of the periodical, effectively shutting them out of participation in any form of correspondence and thereby excluding them from its community. This anxiety is perhaps understandable given the potential impropriety of either a single or even a married women exchanging

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<sup>43</sup> *Intelligencer*, 4 (1858), p. 99.

<sup>44</sup> *Intelligencer*, 1 (1856), pp. 58-59.

letters with an unknown man.<sup>45</sup> However, as Stainton's requirement that at least a name and address be provided (if not necessarily published) by any correspondent as some guarantee of veracity, he was unable to make an exception. As demonstrated by Mrs Duncan, women were very much active participants in nineteenth-century entomology, even if the extent of their contribution is not evident in periodicals.

### 'A Good Move'

The example of the *Intelligencer* soon found an admirer in Germany, and in the sincerest form of flattery, Dr Gottlieb August Wilhelm Herrich-Schäffer (1799-1874) began his own imitation entitled *Correspondenzblatt für Sammler von Insecten, Insbesondere von Schmetterlingen* ('Journal for Insect Collectors, Specially for Collectors of Lepidoptera').<sup>46</sup> Herrich-Schäffer was a physician by profession, but also an entomologist of considerable European repute, having written a highly influential work on the taxonomic classification of Lepidoptera.<sup>47</sup> Stainton remarked upon the *Intelligencer's* new continental counterpart, in an editorial entitled 'A Good Move', and included comments from Herrich-Schäffer on the German entomologist's rationale:

The demand for periodical entomological literature would appear to be supplied already by the Stettin *Entomologische Zeitung*, the Berlin *Entomologische Zeitschrift*, and the Vienna *Monatschrift*, but the two former only appear quarterly, and that though the last-named is a monthly publication, yet all the three are more restricted to works of a purely scientific character.

Herrich-Schäffer continued:

The appearance in London of the *Weekly Intelligencer* first suggested to me [...] the idea of establishing a similar journal for Germany, which, like its London prototype, without pretending to learned investigations, should serve as a medium of intercommunication for the amateurs and collectors of insects [...] We possess in the three above-named periodicals, and in the *Linnaea* and some other works, more than sufficient for scientific and

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<sup>45</sup> For a (predominantly literary) study of the penny post's potential for facilitating impropriety, see Kate Thomas, *Postal Pleasures: Sex, Scandal, and Victorian Letters* (Oxford: Oxford University Press, 2012).

<sup>46</sup> *Correspondenzblatt für Sammler von Insecten, Insbesondere von Schmetterlingen* (1860-61).

<sup>47</sup> *E. M. M.*, 11 (1874), p. 20.

longer treatises, but for some short notices on single species and genera, especially on points of difference between allied species, for observations on their local or periodical occurrence, or on their habits, and especially for notices of which the usefulness consists in their immediate circulation, we have at present no suitable channel.<sup>48</sup>

Although we should be aware of cultural differences between the British and German contexts, Herrich-Schäffer's use of the word 'amateur' here is instructive. We once again have the juxtaposition of more rarefied 'learned investigations' with 'amateur' science. At this period, 'learned' or 'scientific' entomology generally meant works of taxonomic classification, distinguishing one species from another and naming new discoveries, a practice that will be discussed further in chapter three.

The more informal nature of the *Intelligencer*, with a focus on exchanging news and short notices rather than more thoroughly researched 'scientific' articles, was clearly considered to be less forbidding to novices in the field and those unfortunate enough to lack extensive (or expensive) educations. Furthermore, there is a significant distinction drawn between 'scientific' entomologists and those who primarily worked at amassing specimens. 'Amateur' and 'collector' are synonymous, denoting those who acquired insects and other specimens for purposes that were not strictly scientific (at least according to 'learned' entomologists such as Herrich-Schäffer). There were a great number of people who considered collecting and displaying insects, particularly aesthetically pleasing specimens of Lepidoptera, as an end in itself, but we must be wary of any suggestion that such individuals were not participants in the broader project of natural history. The term 'amateur', in this sense, does not necessarily hold any pejorative meaning. The very suggestion that 'amateurs and collectors' required a periodical of their own is an admission of their value to natural history. The *Intelligencer*, and the publications that imitated it, sought to cultivate such 'practical' workers, as Stainton and others who considered themselves to be of a more 'scientific' bent were fully aware of the importance of such men and women to their field. Even if the collectors themselves did not attach any scientific importance to the information or specimens they shared through the periodical, the very act of circulating such information regarding the 'local or periodical occurrence' of insects amongst a wider community was an act that produced scientific knowledge. However, as the following

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<sup>48</sup> *Intelligencer*, 7 (1859), pp. 153-154.

chapters will demonstrate, this distinction between 'collectors' and 'entomologists' became more fraught as the century progressed. The term 'collector' in particular became a heavily loaded term, carrying with it negative connotations rather than the more positive meaning it holds for Herrich-Schäffer in the above quotation.

The primary benefit of the weekly periodical was, however, the speed at which it could transmit news. As alluded to by Herrich-Schäffer, the 'usefulness' of certain information was entirely contingent on it being circulated immediately. Natural history was predicated on fieldwork - that is, going out into the field to observe and collect the natural world. It was highly seasonal, as climatic variations from week to week can drastically alter the populations of specific organisms. Insects in particular are sensitive to this, with the larvae or imago phases of certain species only emerging for a short time when conditions are ideal. This seasonality is demonstrated by the book *Practical Hints Respecting Butterflies and Moths* (1856), referred to above as the publication in which the *Intelligencer's* first issue was advertised. As its extended title indicates, this book formed a 'calendar of entomological operations throughout the year, in pursuit of Lepidoptera'. Consisting of twelve chapters, one for each month, it describes the various different species that occur throughout the year and the varying localities and fieldwork practices required to successfully collect specimens.<sup>49</sup> January, for example, mostly involves collecting insects in the pupae stage of their lifecycle, while the summer months are occupied with the very different activity of pursuing fully matured butterflies. Even with the space of a single month, the occurrence of certain species could vary greatly.

The periodical medium offered a chance to communicate these changes at a greater speed, directly impacting upon the fieldwork of its readers. Consequently, a weekly such as the *Intelligencer* was far more effective than a monthly such as the *Zoologist*. For example, in late May of 1856, Stainton sought to 'direct the attention of two or three hundred pairs of eyes to a plant called *Ægopodium podagraria* (Gout-weed)', in which could be found 'a very innocent looking, rather sticky-looking, caterpillar, that of *Chaubodus illigerellus*'.<sup>50</sup> Stainton hoped that successful collectors would supply him with specimens of the larvae. The *Intelligencer* was still in its first few months of existence, but already had a readership of hundreds that Stainton could call upon. The

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<sup>49</sup> Shield, *Practical Hints*.

<sup>50</sup> *Intelligencer*, 1 (1856), p. 64.

seasonality of fieldwork is demonstrated by a short notice published a month later, as 'R. Drane' of Frederick Street, Cardiff, lamented 'now behold the deserted habitations of *Illigerellus*: I could have gathered hundreds of them: but it was "too late". I find, however, there is one larva'.<sup>51</sup>

The impact of weather upon the fieldwork of individuals is further demonstrated by the example of the Reverend Hugh A. Stowell, of Faversham, whose offer of insects published in the *Intelligencer* brought 'a perfect flood of correspondence, which is quite beyond all my previous calculations'. The clergyman lamented:

That offer was dated May 22nd, but unfortunately did not appear till June 6th. When I wrote *Argiolus* was in fully beauty; now I can find none but wind and rain-worn specimens. [...] With the other three Lep[idoptera]s. named, I hope to be able to supply most of those who want them; but this boisterous weather has come most importunately.<sup>52</sup>

The results of an experiment in physics or chemistry, if carried out under strictly controlled conditions, should (in theory, at least) not significantly vary depending on the seasons. Even in geology, it can be reasonably assumed in most cases that major rock formations will not disappear in the immediate future. Speed of publication, in the case of these sciences, had much more to do with establishing precedence of discovery, and a quarterly or monthly journal was often sufficient for this. While precedence played a significant part in natural history, the added imperative of the short duration of certain species made a weekly periodical necessary.

Herrich-Schäffer's interest in the *Intelligencer* also points towards the internationalism of entomology. Winged insects, much like birds, have no regard for arbitrary national borders imposed by humans. Many of the same moths and butterflies that occurred in Britain could also be found on the Continent. Stainton's extensive European correspondence demonstrates that the science similarly transcended such boundaries. Although the predominant interest of the *Intelligencer's* readers was British insects, Stainton did not entirely limit its pages to this. William Spence, one of the leading entomologists of his generation, wrote a note to Stainton remarking:

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<sup>51</sup> Ibid., p. 110.

<sup>52</sup> *Intelligencer*, 2 (1857), p. 93.

As your excellent *Intelligencer* is the best vehicle for the rapid communication of entomological news, I beg to inform you and your readers that I had the other day a letter from my friend Mr Nietner, of Ceylon, announcing his discovery of a *Stylops* parasitic in a common ant of the island, from the abdomen of which he saw it emerge, and desired me to make known this interesting fact to British entomologists.<sup>53</sup>

Spence specifically chose the *Intelligencer* as the most efficient way to inform the entomological community of his friend's gruesome discovery. He promised to forward both the ant and *Stylops* to John Obadiah Westwood, who would lay them before the next meeting of the Entomological Society. This remained an important step in verifying the find in the eyes of this particular scientific community, but spreading the word through the *Intelligencer* established the precedence of John Nietner, a German-born coffee plantation owner in Ceylon. This perfectly illustrates how the periodical functioned as an 'intelligencer', becoming a key link in the circulation of scientific knowledge.

The difference between exchanging letters one on one and corresponding through a periodical is demonstrated by the case of Robert Burns of Edmund Street, Birmingham. Having placed a notice in the *Intelligencer* advertising his willingness to distribute specimens of '*C. elpenor*' (the striking green-and-pink elephant hawk-moth), 'such a flood of correspondence quite alarmed my little home, eight or ten letters arriving each day - untiring, unceasing - more in one week than in all my life before!'.<sup>54</sup> It seems this startling 'flood of correspondence' was quite a common occurrence among those who advertised in the periodical, as it was also experienced (and described in the same terms) by the Reverend Stowell, as quoted above. A wry note in one issue of the *Intelligencer* advised:

Our correspondents should bear in mind that an offer of duplicate Lepidoptera which includes any of the less common species is pretty sure to produce from 80 to 100 applications; offers of Coleoptera from 40 to 60. We are never surprised at entomologists being overwhelmed with

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<sup>53</sup> *Intelligencer*, 4 (1858), p. 135.

<sup>54</sup> *Intelligencer*, 5 (1858-59), p. 38.

applications, but each new correspondent appears thunderstruck at the result of his announcement.<sup>55</sup>

The exchange of specimens through the periodical is a subject that will be considered in-depth by the next chapter. It is sufficient to remark here that the *Intelligencer* served exactly as its early modern namesakes, forming a key link in a network that permitted individuals to engage in correspondence with a larger community of practitioners. The numbers of applications received points towards the industrial scale of this correspondence network, as previously, few if any collectors of insects could have broadcast news of their duplicates to so many. Again, the novelty of this is apparent, as demonstrated by the shock experienced by those on the receiving end of such a flood of letters.

### **'Practical, Shrewd, Hard-Working Men'**

The reach of the *Intelligencer* is best demonstrated by simply mapping the addresses of correspondents from a single issue. Those who purchased a copy on 3rd April 1858 were able to read epistles from Glasgow and Perth in Scotland; Southport in the North-West; Raleigh, 'near Barnstaple in Devon'; Worth, Sussex; and Watlingbury, Kent. The other seven of the 13 correspondents were all London-based, demonstrating a perhaps understandable bias.<sup>56</sup> Nevertheless, the geographical spread of these letter-writers is significant, as it evinces a community that is not limited to a single area, but is truly national in scope. Furthermore, the list of booksellers and newsagents included in the same issue provides valuable evidence as to where the *Intelligencer* was on sale. Londoners could acquire their copies wholesale from the Edward Newman's premises on Devonshire Street or W. Kent on Paternoster Row, as well as outlets in High Holborn, Shoreditch, and Peckham. The rest of the list gives a diverse spread around the country: Brighton, Leeds, Birmingham, York, Cheltenham, Sheffield, Middleton, Oldham, Rotherham, and Maidstone.<sup>57</sup>

Correspondents and booksellers therefore give a fascinating insight into the geographies of nineteenth-century natural history participation. There is a preponderance of northern towns and cities in this list, and it is difficult to determine the reason for this. There was certainly a notable concentration of natural history activity in

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<sup>55</sup> *Intelligencer*, 3 (1857-58), p. 7.

<sup>56</sup> *Intelligencer*, 4 (1858), pp. 1-8.

<sup>57</sup> *Ibid.*, p. 2.

the northern counties, particularly Lancashire and Yorkshire (the latter became home to the first union of natural history societies in 1861), both of which regions have received attention respectively from Anne Secord and Samuel Alberti.<sup>58</sup> Here is not the place to speculate at length on the causes of this, but it could partly be attributed to the nature of employment found in these locations, at least in the first half of the nineteenth century, which afforded the working classes greater opportunity to engage in such pursuits. The varying patterns of leisure for different trades are likely to be a determining factor in how much free time a worker had to practice natural history, with economic fluctuations impacting significantly upon on this. Closely related to this consideration are the opportunities certain types of employment afforded for the pursuit of knowledge. Jonathan Rose notes that 'in all parts of the kingdom, weavers were legendary for their habit of reading at the loom', which may go some way to explaining why Lancashire in particular was a hotbed of autodidacticism.<sup>59</sup>

Book-learning and natural history are not necessarily related directly, as collecting an insect or plant does not require literacy, but nevertheless a tradition of self-culture and active curiosity is more likely to be engendered when there is a chance for intellectual stimulation. An experienced, competent handloom weaver could operate the loom with their hands and feet in an automatic, mechanical way, leaving their eyes and minds free to dwell on other things. Elizabeth Gaskell describes in her novel *Mary Barton* (1848) how Newton's *Principia* 'lies open on the loom, to be snatched at in work hours', and continues:

It is perhaps less astonishing that the more popularly interesting branches of natural history have their warm and devoted followers among this class. [...] There are entomologists, who may be seen with a rude-looking net, ready to catch any winged insect, or a kind of dredge, with which they rake the green and slimy pools; practical, shrewd, hard-working men, who pore over every new specimen with real scientific delight.<sup>60</sup>

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<sup>58</sup> Anne Secord, 'Science in the Pub: Artisan Botanists in Early Nineteenth-Century Lancashire', *History of Science*, 32 (1994), 269-315; —, 'Corresponding Interests'; Samuel Alberti, 'Amateurs and Professionals in One County: Biology and Natural History in Late Victorian Yorkshire', *Journal of the History of Biology*, 34 (2001), 115-147, —, 'Natural History and the Philosophical Societies of Late Victorian Yorkshire', *Archives of Natural History*, 30 (2003), 342-358.

<sup>59</sup> Jonathan Rose, *The Intellectual Life of the British Working Classes* (New Haven: Yale University Press, 2001), pp. 16-17.

<sup>60</sup> Elizabeth Gaskell, *Mary Barton* (Oxford: Oxford University Press, 2006), p. 90.

Although we should be wary of taking Gaskell's fiction as evidence of a widespread taste for entomology among the Manchester factory workers, it is nevertheless a recurring trope in nineteenth-century writing, with weavers in particular often singled out as notable practitioners in this field. The clergymen-poet George Crabbe, himself a keen entomologist, wrote of an insect-collecting weaver in *The Borough* (1810): 'Eager he looks; and soon, to glad his eyes, [...] Bright troops of virgin Moths and fresh-born Butterflies'.<sup>61</sup> This was later quoted by William Kirby and William Spence in their *Introduction to Entomology* (1815-26), who noted with approval that 'some of the Spitalfields weavers occupy their leisure hours searching for the *Adonis* butterfly [...] instead of spending them in playing skittles or in an ale house'.<sup>62</sup> This paternalistic tone is characteristic of middle and upper-class attitudes to working-class scientific endeavour for much of the century, revealing more about the former than the latter. Given that the public house served as the site of much artisan science, this also betrays an ignorance on the part of the authors.<sup>63</sup>

It can be seen that those who practiced natural history in the nineteenth century were diverse, both in terms of geography and social class. The *Intelligencer* and other periodicals became important media through which these practitioners cohered into a community. We should be wary of suggesting that this made natural history a classless endeavour, but nevertheless it offers us an opportunity to recover the ways in which working-class naturalists participated in the circulation of scientific knowledge, and how this participation was negotiated.

### **An Imagined Scientific Community**

Benedict Anderson's seminal work on nationalism has relevance to the way scientific communities are constructed through periodicals. Just as 'members of even the smallest nation will never know most of their fellow-members, meet them, or even hear of them', a periodical's readership are for the most part unknown to each other, yet 'in the minds of each lives the image of their communion'.<sup>64</sup> The readership of the *Intelligencer*, or any scientific periodical, were unified by reading the same text. Whatever their disparity

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<sup>61</sup> George Crabbe, *The Borough* (London, 1810), p. 109.

<sup>62</sup> William Kirby and William Spence, *An Introduction to Entomology: or Elements of the Natural History of Insects*, 4 vols (London: Longman et al, 1815-26), I, p. 42.

<sup>63</sup> A. Secord, 'Science in the Pub'.

<sup>64</sup> Benedict Anderson, *Imagined Communities: Reflections on the Origins and Spread of Nationalism* (London: Verso, 1983; rev. edn, 2016), p. 6.

in class or geographical location, they nevertheless had an interest in common. In the same way that a newspaper can transcend such differences and bring about a wider consciousness of a nation state amongst its citizens, a community can come into being through a scientific periodical. Anderson's observations on print-capitalism and the emergence of the modern nation are highly pertinent here. Just as the 'convergence of capitalism and print technology on the fatal diversity of human language created the possibility of a new form of imagined community', setting 'the stage for the modern nation', similar forces at work in the nineteenth century created a new, modern form of scientific community.<sup>65</sup>

Entomologists with such extensive networks as Stainton were relatively rare, and those located outside of major metropolitan areas were particularly unlikely to cultivate a wide range of entomological acquaintances. Without this sense of an interest shared with a wide range of individuals, there could be no consciousness of how their individual activities contributed to a greater project. Anne Secord has argued that private correspondence between two individuals should be considered as participation in a community, but the industrialised form of correspondence facilitated by the periodical expanded this perception considerably.<sup>66</sup> Furthermore, it was seen as necessary to create such a community in order to further the advance of science. As Stainton observed, 'the knowledge attained by an *individual*, unless rendered available to others, may be no gain to science: at his death all his thoughts perish, and all his knowledge is lost for ever'. Stainton went on to implore his readers, 'we look upon it as the bounded duty of all who acquire information at once to render it available to others'.<sup>67</sup> This statement shows a recognition that scientific knowledge only becomes so at the point when it is communicated, and an understanding that this knowledge is not produced by individuals acting in isolation within highly localised contexts. Lightman has pointed to this new, mid-nineteenth-century conception of the scientific practitioner as an individual who communicated openly rather than hiding themselves away in the manner of a medieval alchemist.<sup>68</sup>

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<sup>65</sup> Ibid., p. 46.

<sup>66</sup> A. Secord, 'Corresponding Interests', p. 400.

<sup>67</sup> *Intelligencer*, 1 (1856), pp. 121-122.

<sup>68</sup> Bernard Lightman, 'Popularizers, Participation and the Transformations of Nineteenth-Century Publishing: From the 1860s to the 1880s', *Notes and Records*, 70 (2016), 343-359 (p. 355).

In an address to the Entomological Society of London entitled 'How may the onward progress of the study of entomology be best furthered?', Stainton outlined his communal vision of science using a particularly apt analogy:

The bee rifles the flower of its honey not for its own immediate pleasure and enjoyment, but in order that it may be carried home and added to the common store for the use of the community: [...] so must it be with the scientific student.<sup>69</sup>

The comparison of human society with that of bees (also wasps and ants) is one with a rich tradition, stretching back to antiquity. It was a prevalent trope in nineteenth-century Britain, with the long reign of Queen Victoria over an industrious nation of workers making it seem particularly apposite.<sup>70</sup> Stainton here self-consciously conceives of entomologists as part of a community.

On looking through Mr [Frederick] Smith's *Monograph of the British Bees*, we find that it condenses not merely his own observations during twenty years, but also a mass of extraneous observations made by others, themselves unaware of their value, but which, being communicated to Mr Smith, were at once recognised by him as supplying some important link in the chain of information he was collecting.<sup>71</sup>

The *Intelligencer*, therefore, served to accumulate these 'extraneous observations'. The periodical itself, then, should be seen as a site that further promoted this communal endeavour, as the information was no longer shared with a single individual but with an entire community.

Stainton observed that the 'publication of each other's movements reacts favourably upon entomologists', as 'it produces the sympathy of a crowd'. 'Each finding himself no longer isolated, and working only for his own amusement', but instead in a 'higher and more unselfish position', contributing to the 'amusement and instruction of others as well as his own'.<sup>72</sup> This was an imagined community that the periodical itself helped to create, as the circulation reached a peak of 600 across the country. This may seem

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<sup>69</sup> *Transactions of the Entomological Society of London*, 4 (series 2: 1856-58), p. 39.

<sup>70</sup> J. F. M. Clarke, *Bugs and the Victorians* (New Haven: Yale University Press, 2009), pp. 54-79.

<sup>71</sup> *Transactions of the Entomological Society of London*, 4 (series 2: 1856-58), p. 40.

<sup>72</sup> *Entomologist's Annual* (1857), p. 7.

relatively small, but the largest entomological community that had previously existed, the Entomological Society of London, had fewer than 200 members at this time, and these were primarily concentrated in the capital.<sup>73</sup> It gained sufficient notoriety to be mentioned in Charles Dickens' weekly journal *All the Year Round*, in an article on the subject of spiders, which remarked:

The insect hunters are sufficiently numerous to supply six hundred subscribers to their penny weekly newspaper - the *Entomologist's Weekly Intelligencer* - and an army of zealous collectors have been hunting for many years, day and night, running with their nets in the fields, and sugaring the trees in the woods, yet new species are, it is said, caught and recorded every month.<sup>74</sup>

The circulation of 600 only refers to physical copies of the *Intelligencer*, but there was the strong possibility that a single issue would be read by numerous individuals. If it formed part of a library of a club or natural history society, it was likely to have gained an even wider readership.

### **'Sympathetic Communion'**

Before Stainton began the *Intelligencer*, the *Entomologist's Annual* served the purpose of making collectors aware of each other's presence. In the 1856 edition of the *Annual*, Stainton began publishing a list of all entomologists who made their address known to him. He noted that 'of late years the number of Entomologists has increased in a rapid ratio', however, 'EACH WORKS ALONE, yet are there scattered throughout the country many more experienced Entomologists, who would be glad to assist beginners if they knew who were, in that capacity, in want of assistance'. Stainton went on to provide a template letter by which a budding collector could apply to his senior for help:

'Dear Sir,

'Understanding you are willing to assist Entomologists who are only beginners, I should be very glad if you could inform me \*\*\*\*\* Could you oblige me with a sight of your collection, I fancy I might derive from it some useful hints.

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<sup>73</sup> See list of members in *Transactions of the Entomological Society of London*, 4 (new series: 1856-58), pp. xvii-xxiv.

<sup>74</sup> *All the Year Round*, 4 (1862), p. 352.

'Believe me, dear Sir,  
'Yours very truly'.<sup>75</sup>

Correspondence was considered a practice inherent to natural history. Working in isolation, outside of a community, was not a productive endeavour.

The *Annual's* list was first proposed by a correspondent, whose letter was reproduced by Stainton in the preface to the second edition of the 1855 issue:

Would it not be a good plan to have a catalogue of collectors as well as insects. Every known collector in a district probably knows of several collectors, among the lower classes; and though many through jealousy would be unwilling to give up their names, I hope there are enough liberally minded collectors to counterbalance any such feeling.<sup>76</sup>

Responding to this, the Northamptonshire-based Reverend Hamlet Clarke wrote to Stainton to state his own personal interest in such a list:

I have just received your 2nd edition of the *Annual* from my bookseller. It is *quite worth* my speculation of giving my copy of the 1st edition away, and obtaining a copy of the second. [...] I am just now very desirous of finding a coleopterist in Devonshire, in Norfolk, and in Argyle who might work certain localities in their counties for [illegible] which are exceedingly local. I cannot find any, and hence may possibly be at the expense of visiting one or two myself. Now if your proposed list was on my table, I might be able to save this trouble & expense by mentioning any wants to some one who is comparatively on the spot.<sup>77</sup>

Hamlet Clarke was a better travelled entomologist than most, having visited Spain, Algeria, and Brazil earlier in his life.<sup>78</sup> However, it was far more efficient to utilise the localised knowledge of collectors to acquire specimens at a distance, and the *Annual* provided such an opportunity. The *Intelligencer* later refined this process even further,

<sup>75</sup> *Entomologist's Annual* (1856), p. 11.

<sup>76</sup> *Entomologist's Annual* (1855, 2nd edition), pp. vi-vii.

<sup>77</sup> Hamlet Clarke to H. T. Stainton, 6th June 1855, STAIN 23:118.

<sup>78</sup> Hamlet Clarke, *Letters Home from Spain, Algeria, and Brazil during Past Entomological Rambles* (London; John Van Voorst, 1867).

providing a forum through which specimen exchange could be mediated (as will be discussed in the next chapter). The *Annual's* list of entomologists grew from just over ten pages in its first iteration to 47 pages by 1860, containing over 1,200 names. Stainton claimed that he continued to receive letters from new correspondents on an almost daily basis, and expressed regret that he was not 'sufficiently proficient in the art of Mesmerism to be able to hold sympathetic communion with our unknown readers'.<sup>79</sup> It was considered necessary to print the list twice - once in alphabetical order by surname, and secondly arranged geographically by county.<sup>80</sup> By 1861, Stainton chose to exclude it, as it took up too much space to republish every year.<sup>81</sup>

It is, of course, much harder to gauge the extent to which this fostered correspondence between entomologists beyond the pages of the *Annual* and the *Intelligencer*, but an anecdote in the 1857 *Annual* provides some evidence that the list proved useful in bringing people together:

An amusing result of last year's list has become known to us. Two gentlemen were on visiting terms and had known one another for some years, but neither had any idea that the other collected insects, till one of them finds his friend in our 'List of Entomologists'; thereupon the next time they meet there ensues the following conversation: - A. says to B., 'I had no idea you collected insects'. B., 'Oh! yes; I have been collecting many years; have you any taste that way?' A., 'Yes; and I have often wanted to meet with a kindred spirit, and little thought that you were one'.<sup>82</sup>

Endersby has written on the importance of friendship, a 'crucial affective dimension', in binding informal networks of collectors together.<sup>83</sup> Again, the periodical shifts this dynamic, making the process more impersonal. However, this belies the motivations of many of those engaging with the *Intelligencer*, who did so through the same sense of isolation and loneliness that Endersby identifies among his colonial botanists. This seclusion could as often be a result of class as it was the accident of geography. The practice of association and forming societies will be dealt with in chapter four, but the social side of correspondence must also be considered here. There were obvious

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<sup>79</sup> *Entomologist's Annual* (1860), p. iii.

<sup>80</sup> *Ibid.*, pp. 1-65.

<sup>81</sup> *Entomologist's Annual* (1861), p. iii.

<sup>82</sup> *Entomologist's Annual* (1857), p. 13.

<sup>83</sup> Endersby, *Imperial Nature*, p. 85.

material benefits to cultivating such networks, particularly the opportunity to exchange specimens and further your own knowledge, but the strongest impulse for many was the very basic desire to converse with others who shared their enthusiasm.

Stainton's correspondence archive contains many letters in which correspondents remark on the scarcity of fellow entomologists in their locality, and their wish to find someone to converse with either remotely or in person. Many of these letters follow a similar template to the one outlined by Stainton in the *Annual*. Furthermore, many were sent with specimens as a token of goodwill and perhaps as a demonstration of competence. An excellent and particularly far-flung example being that of Geoff Briant, of Hobart Town in Jamaica. Having acquired a copy of the *Annual*, he made contact with Stainton in 1870, beginning 'I have very much pleasure in writing a few lines to you and although we are strangers to each other, I am engaged in doing so from reading the *Entomologist's Annual*'. Noting that Stainton collects the 'Tineina of the whole world', he offers his services as a collector, 'perhaps you like some from this far off island of the sea'. In exchange, he requests information regarding how to kill, set, and pack specimens, expressing regret at his lack of suitable pins for the smaller moths, 'I should feel thankful if you would let me know the proper size to get'.<sup>84</sup>

The case of Thomas Blackburn (1844-1912) demonstrates how correspondence through a periodical could form the basis for a productive and long-lasting collaboration. Blackburn, a merchant's apprentice from Cheshire, first wrote to Stainton whilst in his mid-teens.<sup>85</sup> It was an enthusiastic and slightly precocious letter co-authored with his brother John Bickerton Blackburn (fig. 1.3). The letter began 'seeing your kind invitation in the *Annual & Intelligencer*', leaving no doubt as to why they wrote to Stainton.<sup>86</sup> It detailed the fruits of their youthful collecting endeavours, which they hoped would prove of sufficient interest to be published in the *Intelligencer*. It was not, but this did not deter Blackburn from corresponding further with Stainton. When the *Intelligencer* was discontinued, it was the Blackburn brothers (still in their teens) who sought to replace it with their own *Weekly Entomologist*. Printed in their hometown of Altrincham, Cheshire, this ambitious and ultimately doomed endeavour was initially supported (both morally and materially) by Stainton, who gave four quarterly payments

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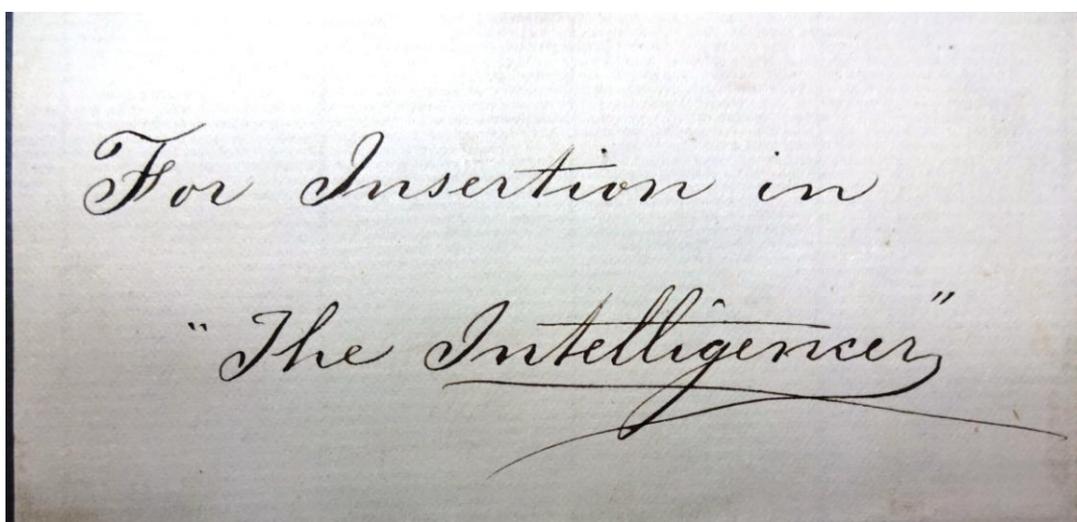
<sup>84</sup> Geoff Briant to Stainton, 31st December 1870, STAIN T 14:118.

<sup>85</sup> *Census Returns of England and Wales, 1861*, 2589, folio 28, p. 50.

<sup>86</sup> Thomas Blackburn and J. B. Blackburn to H. T. Stainton, 9th January 1860, STAIN T 11:118.

of £5 to the upkeep of the periodical. However, the weekly failed to gather a sufficient readership to sustain itself. Stainton withdrew his financial support after the first year, giving no reason, but presumably (and understandably) lacking faith in its viability.<sup>87</sup> Without the personal fortune that had permitted their wealthy patron to bankroll the *Intelligencer*, the *Weekly Entomologist* soon folded. Undeterred, Blackburn's next step was to apply to Stainton again with a proposal for a monthly periodical edited by a board of entomologists, himself and Stainton among them, each with different areas of expertise.<sup>88</sup> Stainton agreed, and it was through their joint efforts that the *Entomologist's Monthly Magazine* was established in 1864 and continues to be published to the present (albeit in a very different guise and no longer on a monthly basis, despite its title).

Correspondence was therefore an important way in which individuals established themselves within the entomological community. The periodical offered an individual such as Blackburn a way in, and although he was never published in the *Intelligencer*, it nevertheless allowed him to develop a fruitful relationship with Stainton. It is unclear at what point the two met in person, though Blackburn wrote on the 14th August 1861 that 'I expect to be in London next week, & should not like to leave without making your



**Figure 1.3** Thomas Blackburn and J. B. Blackburn to H. T. Stainton, 9th January 1860, London, Natural History Museum, H. T. Stainton Correspondence from British Entomologists (MSS STA E 118:118), STAINT 11:118. 'For Insertion in the *Intelligencer*'.

<sup>87</sup> Thomas Blackburn to Stainton, 5th August 1863, STAINT: 11:118. In this letter, Blackburn requests the fourth instalment of Stainton's promised payment. In a note written at the bottom of the page, Stainton states that he encloses the final £5, and informs Blackburn that he does not intend to provide any more money.

<sup>88</sup> Blackburn to Stainton, 5th March 1864, STAINT: 11:118.

acquaintance', so it is reasonable to assume that a meeting occurred at around this time.<sup>89</sup> Blackburn would go on to pursue a career in the Church, an occupation that would take him to the Hawaiian Islands and Australia, where he would continue his entomological pursuits in areas hitherto little-explored by European naturalists. He specialised in Coleoptera (beetles), amassing an extensive collection, with much of the material now being held by the Natural History Museum in London.<sup>90</sup> It may be too grand a claim to state that Blackburn could not have achieved any of this without his early engagement with the *Intelligencer*, but the centrality of periodicals to his development as a man of science cannot be denied.

### **The Razor Grinder**

The role of the periodical in widening participation in the making of scientific knowledge is exemplified by the case of James Batty, a razor grinder from Sheffield. Batty earned his living within the thriving cutlery industry of nineteenth-century Sheffield, an occupation that Frederick Engels described in the *Condition of the Working Class in England* (1845) as being particularly injurious to the worker's health, with many grinders lucky to reach the age of 40.<sup>91</sup> This does not seem to have been the case for Batty, who was born c.1831 and lived into his sixties, despite remaining in the same profession all his life.<sup>92</sup>

Despite the disadvantages of his situation, James Batty acquired sufficient education to read and write. Furthermore, in his leisure time, he took to the study of Lepidoptera. He was a member of the Sheffield Entomological Society and, more significantly, struck up a lively correspondence through the pages of the *Intelligencer*. Batty's letters demonstrate the range of his entomological skill and knowledge, and reveal much about the practices in which he engaged. These notes are written in a large but careful hand, on small, cheap pieces of paper that contrast with much of the personalised stationery employed by Stainton's more affluent correspondents (fig. 1.4). Batty's first published letter was in the issue for Saturday 20th June 1857, announcing to the world his

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<sup>89</sup> Blackburn to Stainton, 14th August 1861, STAIN 11.118.

<sup>90</sup> *E. M. M.*, 48 (1912), p. 219; 'Coleoptera Collections', *Natural History Museum*, <http://www.nhm.ac.uk/our-science/collections/entomology-collections/coleoptera-collections.html> [accessed 29th September 2016].

<sup>91</sup> Frederick Engels, *The Condition of the Working Class in England* (Oxford: Oxford University Press, 1999), pp. 211-112.

<sup>92</sup> *Census Returns of England and Wales, 1861*, 3492, folio 39, p. 8; *Census Returns of England and Wales, 1891*, 3820, folio 43, p. 35.

pleasure upon finding a 'fine female specimen of *Ceropacha fluctuosa*' in his 'breeding-cage'.<sup>93</sup> The breeding cage was a small, box-like structure with the sides covered in a fine gauze that prevented the insects within from escaping, but allowed them to breathe. It was usually kept in a darkened space in order to simulate the underground conditions in which many Lepidoptera species pupate, transforming from a caterpillar into a butterfly or moth. This was a mode of acquiring specimens very unlike pursuing them in the wild, and required a different kind of expertise and dexterity, as not all species responded well to this treatment. Being the first to successfully breed a particularly difficult species ensured renown among the entomological community. Batty's second notice finds him out in the field, noting that he had come across the species *Margaritia augustalis* 'in a meadow near Maltby Woods'.<sup>94</sup> Around a month later, in early August, Batty entered into the process of specimen exchange, advertising his willingness to part with a few 'fine specimens' of the aforementioned *Ceropacha fluctuosa* in return for species that he listed in the advertisement.<sup>95</sup> Through the periodical, we see that Batty was involved in a wide variety of scientific practices: corresponding, associating, collecting in the field, and breeding insects at home.

Through Batty's letters to the *Intelligencer*, we gain real insight into the fieldwork practices of working-class naturalists. A notable published narrative gives an intriguing account of how Batty went about acquiring his specimens:

On the 4th inst. [of June 1858] I and a friend, Mr Moore, being provided with a two-yards-square sheet, took the route for Maltby Woods, where we arrived at 9am. We put the sheet together, and began to beat some large elms, oaks, &c. [...] We then wrapped up the sheet, and took our nets and worked hard till three in the afternoon [...] We returned home quite satisfied with our journey.<sup>96</sup>

Two distinct collecting methods were utilised here. The first was a 'beating sheet', a large piece of cloth spread beneath a tree to catch whatever falls as the vegetation is vigorously beaten by the collector(s). In this instance, it proved fruitful, with '100 larvae' of one particular butterfly species among the results. The second method is more

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<sup>93</sup> *Intelligencer*, 2 (1857), p. 91.

<sup>94</sup> *Ibid.*, p. 100.

<sup>95</sup> *Ibid.*, p. 151.

<sup>96</sup> *Intelligencer*, 4 (1858), p. 85.

traditionally associated with entomology, that being the use of hand-held nets to capture imago insects that were presumably active and relatively abundant during the summer months. The identity of 'Mr Moore' must remain enigmatic, though it is quite possible that he was B. J. Moore, another (less frequent) correspondent to the *Intelligencer*.<sup>97</sup> A resident of York, B. J. Moore was the only other individual of that surname who featured in the *Intelligencer*. That Batty was able to refer to his friend simply as 'Mr Moore' suggests that he was someone already known within the community, adding weight to the possibility that these two Moores are the same individual. If this is indeed the case, it raises the interesting question of how the two men, one living in Sheffield and the other in York, became acquainted. It is quite possible that the *Intelligencer* facilitated their friendship, but this must remain largely a matter of speculation.

Maltby Woods are located over ten miles to the north-east of Sheffield, near to the town of Maltby, and were a favoured hunting ground for Batty. Due to its geology and the species occurring there, it was an area much frequented by individual naturalists and society excursions during the nineteenth century. The woods remain to the present, with the nearby Maltby Low Common being a nature reserve which continues to attract local enthusiasts.<sup>98</sup> Although it was not explicitly stated by Batty, the 'route to Maltby Woods' must have been a journey made by train, as the distance could not otherwise have been travelled in such a short time. This account gives some indication of the range a naturalist could cover, and an excellent example of how the railways impacted on their collecting practices. Furthermore, it epitomises the kind of localised information the *Intelligencer* was effective in transmitting, particularly during the height of the collecting season when others could profit from up-to-date news of which species were occurring in localities around the country.

Anne Secord has shown how the social differences between artisan and gentlemen botanists were negotiated through correspondence. She contends that whilst it is tempting to suggest that correspondence acted as a democratising medium, permitting working-class naturalists to converse with their 'elite' counterparts on a more egalitarian basis, epistolary behaviour enforced the same class distinctions by raising questions of trust and authenticity. In assessing the character - and therefore the veracity - of artisan

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<sup>97</sup> His one contribution in 1858: *Intelligencer*, 4 (1858), p. 139.

<sup>98</sup> 'Maltby Low Common Nature Reserve', *Yorkshire Wildlife Trust*, <http://www.ywt.org.uk/reserves/maltby-low-common-nature-reserve> [accessed 9th January 2017]

correspondents, gentlemen often 'had no more to go on than the same piece of paper that faces the historian'.<sup>99</sup> Periodicals complicated this, as published correspondence was no longer a private mode of communication, but rather a public act. Furthermore, the materiality of the letter was transformed, with the original piece of paper replaced by the standardised printed page of the periodical.

The role of Stainton as editor was of great importance, as he acted as an intermediary between the correspondents and the *Intelligencer's* readers. Effectively, Stainton's status as an entomologist lent to all those whom he published a degree of supposed reliability, operating in much the same way that a private correspondence network relied on personal introductions and testimony regarding an individual's trustworthiness. The deference that characterised the letters written by artisan naturalists to those of higher social status is still evident in how Stainton himself was addressed, but notices intended for publication are freed from this necessity. No longer intended for a specific recipient, each letter was afforded verisimilitude by virtue of its appearance in print.

In the case of Batty, there was no indication of his social status, with his name and address the only information provided as to his identity. His skill and expertise as an entomologist was displayed through the *Intelligencer*, clearly illustrated by the ability to capture, breed, and identify numerous species of Lepidoptera. Batty's messages become more detailed and self-confident, giving meticulous descriptions of the appearance and habits of larvae, using more specialised terminology: 'larva rigid rugose [...]; head slightly bifid [...]'.<sup>100</sup> Writing a letter for publication in a periodical was a public, performative act, as opposed to the more private practice of corresponding with an individual. Batty's skill and knowledge was questioned by another Sheffield collector, William Thomas, who disputed the razor grinder's claim to have bred *Acidalia inornata* - a small brown moth now known as *Idaea straminata*, or the 'Plain Wave'. Batty had found that this species was proving particularly difficult to cultivate, and had enquired of the other readers as to its occurrence and feeding habits.<sup>101</sup> In answer, Thomas - a fellow working man listed in the 1861 census as a 'Furnace Builder' - asserted that 'I and several of my correspondents have bred the above-named species this year', encountering none of the great difficulties Batty had complained of aside from a 'rather

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<sup>99</sup> A. Secord, 'Corresponding Interests', p. 407.

<sup>100</sup> *Intelligencer*, 8 (1860), p. 172.

<sup>101</sup> *Intelligencer*, 10 (1861), p. 84.

tedious' ten-month wait for the larvae to pupate. Acknowledging that this moth was frequently confused with the very similar *Acidalia aversata*, or 'Ribband Wave', Thomas magnanimously noted that it was Batty who 'first pointed out the differences of the two species to myself', revealing that the two men knew each other (it is likely they met at meetings of the Sheffield Entomological Society, though it has not been possible to verify this).<sup>102</sup> Thomas' reference to his 'correspondents' gives an indication that such men already operated within networks of their own outside of the periodical, but this was likely to have been on a more limited scale.

Batty's response to Thomas, sent to Stainton but never published in the *Intelligencer*, suggested that 'Mr T. wants to make his self appear very large'. Batty went on to remark, 'I should think if Mr T. had bred a *Inornata* he would have been in a great hurry to publish it to have the first claim but I think he's not yet on the throne'.<sup>103</sup> That this dispute was carried out in the public forum of a nationally-distributed periodical, rather than privately between two individuals who were already acquainted and living in close proximity, suggests that the publication came to play an important role in the self-identification of these two men. Choosing to publicly dispute a claim was a provocative act, calculated to call into question another naturalist's aptitude, and Batty's ire is palpable in his reply. It may have been a matter of space that influenced Stainton's decision not to print the rebuttal, or quite possibly a distaste for such disputes, which could be perceived as having much more to do with ego than the interests of science. While Thomas' letter may have disputed Batty's assertion, it nevertheless contained pertinent information regarding the breeding of the *Inornata*, while Batty's response was simply one of wounded pride. Stainton seemed to care more about knowledge itself rather than those who were first to discover it, and this perhaps points to divergent conceptions of science and skills between working-class and gentleman naturalists as described by Anne Secord.<sup>104</sup>

Batty died in 1893, less than a year after Stainton's own death. The razor grinder had clearly gained enough repute within the entomological community that his obituary was published in at least four periodicals, including the *Entomologist's Monthly Magazine*. The short notice, written by his friend A. E. Hall and replicated verbatim in each

<sup>102</sup> Ibid., p. 92; *Census Returns of England and Wales, 1861, 3494*, folio 105, p. 18.

<sup>103</sup> James Batty to H. T. Stainton, 25th June 1861, STAINT 4:118.

<sup>104</sup> A. Secord, 'Science in the Pub'.

publication, described Batty as 'a useful worker', and 'an excellent type of the working man lepidopterist':

Batty had an excellent knowledge of larvae, and was the discoverer of the larvae of *Tapinostola elymi* and *Celæna haworthii*. He was a regular correspondent of the late Mr Wm. Buckler and the late Rev. Joseph Hellins, and used to keep them well supplied with material for description.<sup>105</sup>

Here we have Batty cast in the mould of a self-made, working-class scientific hero, a trope enshrined in the biographical works of Samuel Smiles.<sup>106</sup> The razor-grinder was 'useful' in providing specimens to others, but it is notable that although he 'discovered' the larvae of *Tapinostola elymi* (a moth known as a Lyme Grass), he was not the one who described it. As noted above, he sent the specimen on to the noted entomological illustrator William Buckler, who wrote a full scientific notice of it in the *Entomologist's Monthly Magazine*. Buckler thanked Batty in print, remarking that the latter 'took a long journey during inclement weather, that he might search for the larva of this species'.<sup>107</sup> Once again, Batty was portrayed in heroic terms, battling the elements for the greater good of science. It was not mentioned exactly where Batty had travelled to, but it is reasonable to assume some distance from Sheffield. The larvae of this particular moth feed exclusively upon *Leymus arenarius*, a type of grass that only occurs on the eastern coast of Britain, though this need not have necessitated travelling outside of Yorkshire. Presumably his specimens of *Celæna haworthii* (Haworth's Minor) were collected a little closer to home, as this moth occurs most commonly in wild moorland of the kind abundant in Batty's native county. These larvae were also sent to Buckler, who undertook their description.<sup>108</sup>

Through the periodical, Batty participated in a correspondence network far larger than any he could have cultivated on an individual basis. Like some of the correspondents cited earlier in this chapter, he also experienced the unexpected deluge of letters in response to an advertisement of specimens:

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<sup>105</sup> *E. M. M.*, 29 (1893), pp. 287-288. See also: *British Naturalist*, 3 (1893-94), p. 248; *Naturalist*, 18 (1893); p. 355; *Entomologist*, 26 (1893), p. 368.

<sup>106</sup> Anne Secord, "'Be What You Would Seem To Be": Samuel Smiles, Thomas Edward and the Making of a Working-Class Scientific Hero', *Science in Context*, 16 (2003), 147-173.

<sup>107</sup> *E. M. M.*, 8 (1871), pp. 68-69.

<sup>108</sup> *E. M. M.*, 10 (1873), pp. 195-196.

Sheffield March 31 1857  
 Capture of Lepidoptera  
 I have this past week  
 captured sixteen fine  
*Anisopteryx aescularia*  
 on trunks of Elms and all  
 males not a single female  
 amongst them  
 near Sheffield  
 James Batty  
 Sheffield

**Figure 1.4** James Batty to H. T. Stainton, 31st March 1857, London, Natural History Museum, H. T. Stainton Correspondence from British Entomologists, MSS STA E 118:118, STAIN 4:118. This is a note announcing the 'Capture of Lepidoptera', presumably intended for inclusion in the *Intelligencer*, but not published. It reads: 'I have this past week captured sixteen fine *Anisopteryx aescularia* on trunks of elms and all males not a single female is amongst them'.

I have received so many applications for *L[iparis]. dispar, &c.*, in consequence of the notice of my duplicates in the *Intelligencer*, that I cannot possibly answer all; those who do not hear from me must therefore conclude that my stock of duplicates is exhausted.<sup>109</sup>

Batty should not be dismissed as simply a provider of specimens to others, but seen instead as an entomologist in his own right, taking an active part in the making of scientific knowledge. Although he was perhaps one of the more exceptional working-class men of this kind, he was by no means alone in his pursuit, as demonstrated by his bricklaying acquaintance William Thomas. Individuals such as these played an important function within a loosely defined scientific community of practitioners, and an approach grounded in communicative practices reveals their role in greater detail.

### **Entomologists in Fustian**

Stainton was particularly committed to encouraging entomology amongst those less socially fortunate than himself, boldly stating that 'entomologists are not drawn from the wealthy, but rather from the working classes'.<sup>110</sup> This is a claim that is difficult to verify, but the existence of correspondents such as James Batty prove that this was not an entirely idealised conception. As remarked upon earlier, there was a distinct association of certain trades with the pursuit of natural history. Stainton remarked upon this, stating: 'the Spitalfield weavers, the Sheffield cutlers and the Manchester cotton-spinners are amongst the most successful collectors of insects, as well as great amateurs of birds and flowers'.<sup>111</sup> Stainton may not have envisioned science as entirely classless, but he acknowledged the worth of such individuals to the project of natural history:

An Entomologist is none the less one because he wears fustian, and 'labours, working with his hands'; and in very many of this class the innate love of these beautiful objects of creation, the Butterflies and Moths, supplies them with one of their purest pleasures. Should not such tastes and such pursuits be encouraged? An observation, if new, is as important by whomsoever made; and a Spitalfields weaver may supply some important gap in our

<sup>109</sup> *Intelligencer*, 3 (1857), pp. 46-47.

<sup>110</sup> *Entomologist's Annual* (1855), p. 3.

<sup>111</sup> *Intelligencer*, 5 (1858-59), p. 183.

knowledge, which Oxford and Cambridge put together would fail to elucidate.<sup>112</sup>

Although Stainton was always eager to recruit beginners into entomology, his work should not be considered simply as 'popularisation'. He was fully aware that various kinds of natural history were being done amongst the working classes, and his efforts through the *Intelligencer* are therefore an attempt to acknowledge this fact and to recruit these workers towards the useful purpose of advancing entomological knowledge. Although he points to the moral benefits of such pursuits amongst working men, this does not appear to be his primary motivation in cultivating natural history as rational recreation. Earlier in the century, in the face of Chartist agitation and the threat of radical print, natural history (when presented or interpreted correctly) was considered a 'safe' form of knowledge, calculated to defuse potential revolution by occupying the minds of discontented labourers.<sup>113</sup> This anxiety had waned somewhat by the 1850s, as demonstrated by the repeal of the taxes on knowledge. Stainton was a staunch Liberal, who apparently only differed from the party-line on the vexed subject of Ireland. He was very likely, therefore, to have been in favour of franchise reform that was debated in the 1850s and 1860s, which acknowledged that the working classes were worthy of participating in democracy as well as science.

Stainton was by no means alone in taking this position, as an ideology of participation permeated many periodicals of the period. Newman stated in the introductory address of the *Zoologist* 'every one who subscribes a single fact is welcome - nay, more than that - has a direct claim to be admitted as a contributor'.<sup>114</sup> Likewise, the *Phytologist* sought 'FACTS, OBSERVATIONS and OPINIONS' which would be considered 'too trifling' for those of 'high scientific pretensions'. Rather, it concerned itself with the 'field-botanists - these observers - these labourers in the delightful fields of botanical enquiry'.<sup>115</sup> At the heart of both these periodicals lay the centrality of fieldwork to the accumulation of knowledge in natural history. A similar rhetoric is apparent in the *Geologist*, edited by S. J. Mackie, who stated in 1858:

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<sup>112</sup> *Entomologist's Annual* (1855), p. 3.

<sup>113</sup> James Secord, *Victorian Sensation: The Extraordinary Publication, Reception, and Secret Authorship of Vestiges of the Natural History of Creation* (Chicago: University of Chicago Press, 2001), pp. 40-76.

<sup>114</sup> *Zoologist*, 1 (1843), p. vi.

<sup>115</sup> *Phytologist*, 1 (1844), p. v.

I desire again to express a hope that the humblest geologist in this or any other land will never hesitate to communicate anything that he thinks a new fact or discovery. No one at my hands will ever meet with a rebuff for his want of knowledge or skill.<sup>116</sup>

While few periodicals took this to such an extreme as the *Intelligencer*, a host of publications relied on the observations of their correspondents for their content. *Hardwicke's Science-Gossip* (1865-93) is another such example, its friendly title inviting those at all levels of knowledge to make a contribution, no matter how small or seemingly insignificant.

We make no great pretensions, our desire being to gossip with our readers, as a man chats to his friend, of passing events in which we are interested, to ask and answer queries, and pass a pleasant half-hour in talking scientific subjects in the language of the fireside, and not as *savans*.<sup>117</sup>

This emphasis on 'gossip', emphasised by the very title of the periodical, is in many ways similar to the efforts of Stainton and Newman to produce periodicals that were not overly 'scientific', but nevertheless allowed a diverse community of readers to make a small contribution to knowledge. Unlike the *Intelligencer*, however, the motives of Robert Hardwicke, a successful entrepreneurial publisher, were likely to have been influenced considerably more by a commercial impulse and the desire to attract free copy for the magazine.

It is important not to consider working-class participants as simply providers of specimens from which the gentlemen of science produced the 'high' science of description and systematising. If we are to understand how scientific knowledge was produced in this period, we must consider the periodical as a significant site for participation. Although the democratising influence of the periodical medium must not be overstated (as will be examined further in subsequent chapters), it nevertheless nurtured thriving communities of practitioners that did not preclude those such as James Batty from taking part. The practice of scientific correspondence was key to this, as the periodical took an established form and applied to it the new-found industrial efficiency of the nineteenth century. In doing so, it altered the ways in which practitioners

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<sup>116</sup> *Geologist*, 1 (1858), p. i.

<sup>117</sup> *Hardwicke's Science-Gossip*, 2 (1866), p. 1.

interacted and brought about new opportunities for both gentlemanly naturalists such as Stainton and his more humble counterparts.

### **Conclusion**

In December 1866, a Mr William Gray was arrested in Londonderry and charged with 'coming down Pump Street and knocking at every house'. Hauled before the town's mayor, it transpired that the prisoner was, in fact, a naturalist in search of a Mr Greer, with whom he had made contact through the pages of the periodical *Hardwicke's Science-Gossip*, and struck up a correspondence. Gray had hoped to personally deliver a sample of 'diatomaceous earth', but an unfortunate confusion over the correct address had led to his alleged crime. Upon examination of his papers and the testimony of Mr Greer, Mr Gray was eventually set at liberty, much to the annoyance of the police constable, who had observed with growing consternation as the two men, hitherto strangers, had fallen into animated conversation about their 'favourite pursuits' of natural history. The officer was heard to remark, 'it was d-d quare [*sic*] that fellows that never knew each other should have so many acquaintances'. An account of this incident was later published in pages of *Science-Gossip* as an amusing aside for its readers.<sup>118</sup>

This episode is taken from another periodical, and at a later date than the *Intelligencer*, but nevertheless nicely illustrates how periodicals served to facilitate correspondence between naturalists, permitting 'fellows that never knew each other' to cultivate a wide circle of 'acquaintances'. When the *Intelligencer* is situated within the context of both natural history and the print culture of the mid-nineteenth century, it is revealed as the outcome of a number of developments, both technological and cultural. It applied the new industrial methods of production to the already established method of scientific correspondence, rendering it both more efficient and effective. Through this intercommunication, a scientific community emerged on a scale that had not hitherto been possible. The disparate, localised clusters of practitioners were brought into communion with a far wider network, allowing them to exchange both information and specimens. This community consisted of individuals from across the social spectrum, allowing working-class naturalists the opportunity to engage with a far larger number of correspondents. This was an aim self-consciously pursued by Stainton and a host of other periodical editors, who wished to recruit these practitioners in the process of

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<sup>118</sup> *Hardwicke's Science-Gossip*, 3 (1867), p. 15-16.

collating observations that incrementally added to the store of knowledge. Their emphasis on the practical aspects of natural history, and a willingness to 'gossip' rather than employ forbidding scientific language, was a strategy that sought to welcome into the fold collectors such as James Batty. Study of the periodical therefore allows us to recover the practices of these naturalists, and the periodical itself became integral to the ways in which natural history was carried out.

According to Susan Sheets-Pyenson, the participatory ideology of popular natural history periodicals in this period can be characterised as 'low science', but this presupposes a fixed definition of 'high science'.<sup>119</sup> For entomology, and natural history more generally, it is not possible to draw such a distinction in the mid-nineteenth century. Even if we assume that 'high science' is represented by the metropolitan elite of the Royal and Linnean Societies, or the Entomological Society of London, we immediately run into difficulties. A figure such as Edward Newman, who Sheets-Pyenson presents as typical of this 'low' scientific culture, held a respected position within these 'high' scientific circles. Although never admitted into the Royal Society (very few entomologists were), Newman was a founding member of the Entomological Society, and a Fellow of the Linnean Society. He produced original research, and wrote works of taxonomic classification that are generally associated with the 'high' science of this period. Consequently, he can hardly be considered an outsider in relation to the scientific establishment (if such an amorphous network of associations can be labelled as such), even if his relationship with fellow entomologists was by no means an untroubled one (see chapter three). Furthermore, any elision between gentleman naturalists and the scientific elite is misleading, not least because the very concept of the 'gentleman' itself was undergoing significant refashioning in this period (as will be discussed further in chapter two). The whole project of natural history rested upon such a complex grouping of varied individuals that any notion of high and low is of dubious value as a mode of analysis. Rather, we must be more sensitive to the often competing ways in which the actors themselves conceived of their practices.

Challenging the distinction between high and low science in natural history, at least with reference to the first half of the nineteenth century, should not be taken to suggest that it was a classless endeavour, or that there were no serious economic and social obstacles confronting many in their pursuit of science. On the contrary, it acknowledges

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<sup>119</sup> Sheets-Pyenson, 'Popular Science Periodicals'.

this, and thereby enables a far more nuanced analysis of the ways in which these scientific communities were created through acts of self-fashioning by their constituent members, a self-fashioning in which the new means of communication and interaction provided by periodicals were crucial. The next chapter will make a closer study of the practices of collecting and exchanging specimens through the *Intelligencer* in order to demonstrate how the boundaries of this newly formed scientific community were negotiated.

## CHAPTER TWO

### Collecting

'What do you catch 'em for? Are they good to eat?' was a question often posed to Henry Tibbats Stainton by bemused bystanders to his pursuit of moths.<sup>1</sup> Collecting was a nineteenth-century passion. The study of natural history in particular was predicated on the act of going into the field and acquiring specimens of nature, which could be displayed, circulated, and studied at leisure. Writing in the *Entomologist's Annual* for 1856, John Lubbock described the obsession:

The present has been called the age of insects; this century at least might be called the age of collections of insects, and not of insects only, for we have collections of almost everything, of shells and stuffed birds, of ferns and flowers, of grasses and coins, of autographs and old china, of Assyrian marbles and even postage stamps. Mr Darwin once expressed to me his surprise that he had never met with any one who collected odd-shaped biscuits; and though the idea seems at first sight quite ludicrous, yet a collection of the biscuits of different nations would possess many more points of interest than can be found in postage stamps.

Lubbock believed that a collection should serve some purpose, as 'a collection of insects which is not studied is of as little real use as books which are not read'.<sup>2</sup> Collecting, therefore, was considered to be a vital practice through which scientific knowledge was circulated. Its importance to the understanding of the history of natural history has become increasingly recognised of late, attracting the attention of a number of historians.<sup>3</sup> However, not all collecting was scientific, as Stainton noted in the preface to the previous year's *Annual*:

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<sup>1</sup> *Entomologist's Annual* (1858), p. iii.

<sup>2</sup> *Entomologist's Annual* (1856), p. 115.

<sup>3</sup> Jim Endersby, *Imperial Nature: Joseph Hooker and the Practices of Victorian Science* (Chicago: University of Chicago Press, 2008); Anne Secord, 'Corresponding Interests: Artisans and Gentlemen in Nineteenth-Century Natural History', *British Journal for the History of Science*, 27 (1994), 383-408; —, 'Pressed Into Service', in David Livingstone and Charles Withers (eds), *Geographies of Nineteenth-Century Science* (Chicago: University of Chicago Press, 2011), pp. 283-310; Anne Larsen, 'Not Since Noah: The English Scientific Zoologists and the Craft of Collecting, 1800–1840' (unpublished doctoral thesis, Princetown University, 1993).

Indeed, as there are anglers who look only to the pot, so there are a numerous set of collecting Entomologists, who look only to the pocket, and have hardly a spark of true love of science in their composition.<sup>4</sup>

The views of Lubbock and Stainton were shared by many who practised natural history in the nineteenth century.

Specimens are central to the practice of natural history, serving as 'the interface between the naturalist and the natural world in all its variety'.<sup>5</sup> Non-living specimens are not natural objects, however, but rather 'artificial things designed and constructed by naturalists to answer various scientific needs'.<sup>6</sup> To collect and prepare a scientifically useful specimen requires 'a combination of craft skills, local knowledge, and book knowledge'.<sup>7</sup> With reference to early nineteenth-century botany, Anne Secord observes that specimens gave individuals, including working men, the ability to engage with science, 'not only by being material objects of exchange, but also because they displayed the attainment of the requisite observational skills to participate in science'.<sup>8</sup> A study of collecting practices, as mediated through the periodical, can therefore serve as a way to examine how the boundaries of this community were negotiated, determining who should be included and excluded. We have already seen in the previous chapter how angrily James Batty reacted to any suggestion that he was insufficiently skilled to identify and breed certain moth species, and this is understandable if we consider evidence of such proficiency as being the requisite criteria for participation in the community of the *Entomologist's Weekly Intelligencer*. This was fundamentally a question of trust, and by extension, a debate over exactly what was admissible as 'science'. This chapter will demonstrate that this issue was confronted through the mid-nineteenth-century language of class and character.

### **'Erroneous Announcements'**

The second edition of the *Entomologist's Annual* for 1855 included extensive instructions on collecting various types of insect. Stainton gave detailed advice for the capture and preservation of Lepidoptera, and Thomas Vernon Wollaston provided a

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<sup>4</sup> *Entomologists Annual*, 2nd edn (1855), p. vi.

<sup>5</sup> Anne Larsen, 'Equipment for the Field', in Nicolas Jardine, James Secord, and Emma Spary (eds), *Cultures of Natural History* (Cambridge: Cambridge University Press, 1996), pp. 358-377 (p. 377).

<sup>6</sup> *Ibid.*, p. 358.

<sup>7</sup> Endersby, *Imperial Nature*, p. 81.

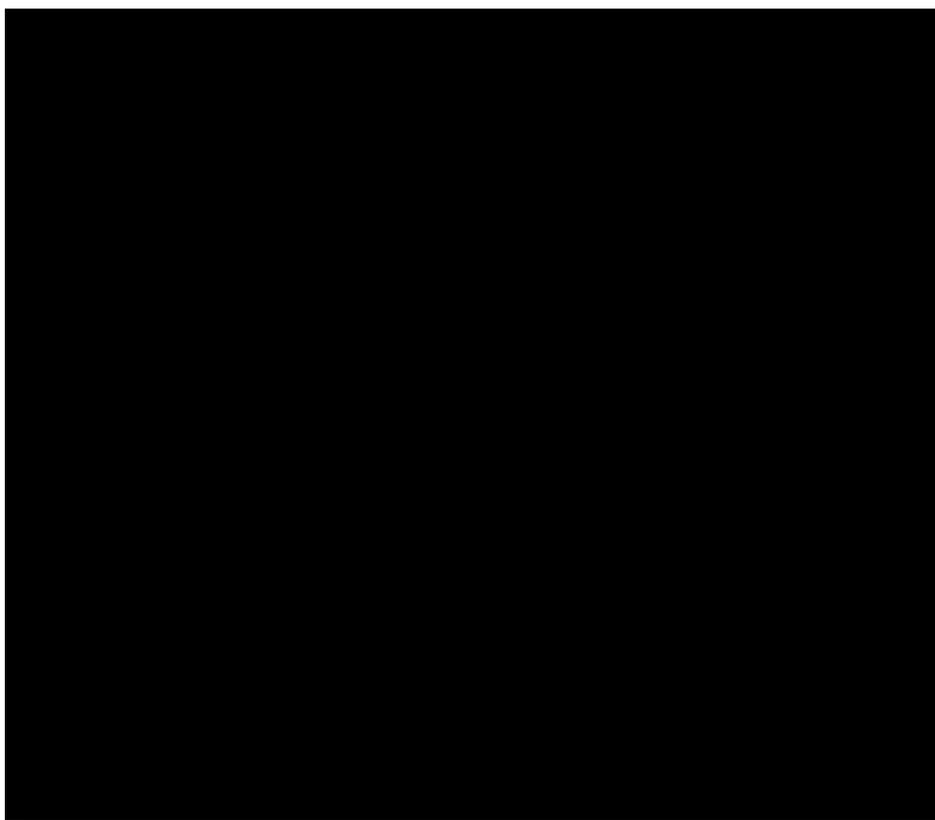
<sup>8</sup> A. Secord, 'Pressed into Service', p. 307.

similar piece on Coleoptera. These pieces were added to the second edition of the *Annual* after the first proved surprisingly successful. The *Annual* cost half a crown and was produced in a size that could easily fit in a pocket. Rather than being a weighty reference tome to be kept at home, it could quite feasibly be carried into the field on collecting trips. This is something Stainton had earlier considered when publishing his *Entomologist's Companion* in 1852, a single-volume guide to insect collecting produced in duodecimo size (roughly equivalent to a modern mass market paperback), 'its small size enabling the Collector to take [it] with him on all excursions', and to study 'when proceeding to his destination by railroad'.<sup>9</sup> The *Intelligencer* was also of similar dimensions for the very same reason. Print and fieldwork were inextricably linked in Stainton's view, each informing the other. In aiming to further the progress of entomology through the publication of books and periodicals, he wished to ensure that collecting was carried out according to specific methods and practices that would ensure any observations were sufficiently accurate and verifiable. Anne Secord has observed with regards to early nineteenth-century botany that 'collectors had not only to possess the ability to accurately identify familiar plants in order to spot rarities, but also to be aware that a prized rarity in one area might be extremely common elsewhere and thus of local interest only'. She contends that 'the key issue in understanding the process which collectors could contribute to the production of botanical knowledge is less the techniques by which knowledge circulated [...] but the practices that enabled collectors to judge which knowledge was worthy of circulation'.<sup>10</sup> This argument is applicable to natural history more generally. In the second half of the century, specialist periodicals such as the *Intelligencer* fulfilled this essential role of making individual practitioners aware of the collecting activities of others. As a result, it not only served as a way by which they could engage in science, but gave them a broader understanding of how their own work fitted into a greater whole.

The *Intelligencer* rarely featured illustrations as these would have raised production costs considerably, and we have seen how Stainton was eager to maintain the periodical as a cheap publication. The few images employed by Stainton are therefore worthy of remark, as they were clearly intended to serve a very specific purpose that could not be fulfilled by words alone. On Saturday 10th July 1858, readers of the *Intelligencer* were treated to a delicate woodcut of a 'Tiger Moth' (*Arctia caja*), printed on the front page

<sup>9</sup> Henry Tibbats Stainton, *Entomologist's Companion* (London: John Van Voorst, 1852), p. iii.

<sup>10</sup> A. Secord, 'Pressed into Service', p. 291.



**Figure 2.1** *Entomologist's Weekly Intelligencer*, 4 (1858), p. 113. Woodcut of the Tiger Moth (*Arctia caja*).

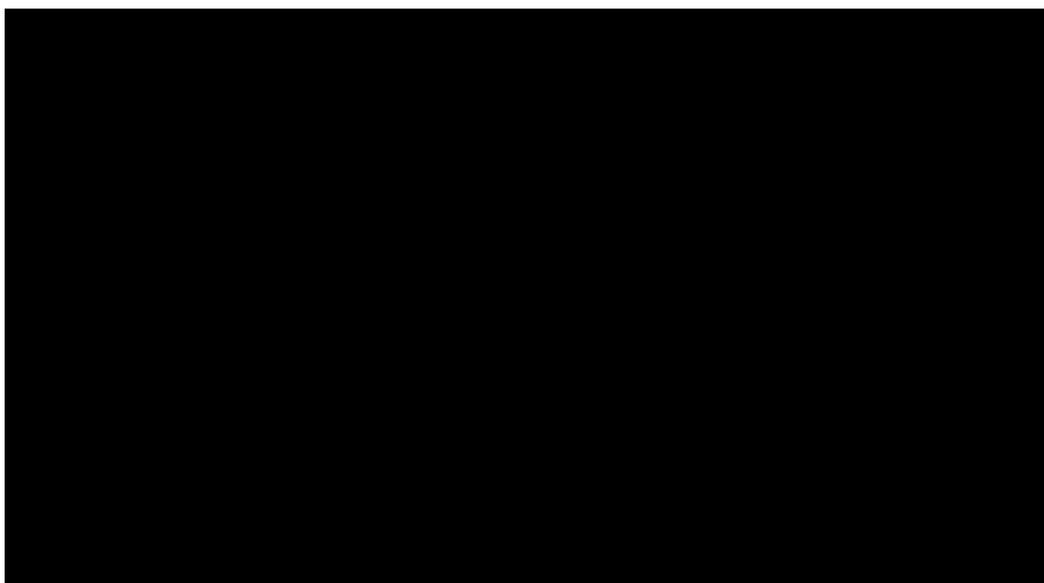
between the periodical's title and Stainton's editorial (see fig 2.1). Although this image is black and white, and cannot convey the bright and distinctive red colouration of the moth's hind wings, it nevertheless displays the characteristic patterning that would aid in identification. In a note on the following page, Stainton comments:

Our woodcut this week represents a very beautiful, though abundant, species, and will be useful in preventing premature announcement of a capture of *Hebe*. We believe *Hebe* alluded to in our columns last year (*Int.* ii. p. 125), was neither more nor less than our *very old* friend *Arctia caja*.<sup>11</sup>

The '*Hebe*' referred to is the Hebe Tiger Moth, a species that has some resemblance to the *Arctia caja*, but does not occur in Britain. The discovery of an insect that had hitherto not been found in the country was a notable occurrence, and considered of scientific importance, but very often announcements of this kind were later proven to be a case of misidentification, and occasionally deliberate misinformation. Stainton's purpose in publishing the illustration was to clarify a misunderstanding, and to aid his

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<sup>11</sup> *Entomologist's Weekly Intelligencer*, 4 (1858), p. 114.



**Figure 2.2** John Obadiah Westwood, *Entomologist's Text Book; An Introduction to the Natural History, Structure, Physiology, and Classification of Insects* (London: William Orr and Co., 1838), p. 29. The flap-net is for catching insects in flight, while the sweeping net is used in water or undergrowth. The gauze forceps allow insects to be handled delicately to minimise damage, and the breeding cage (essentially a box with gauze sides) is for rearing larvae from the egg.

readers in verifying their specimens before writing potentially inaccurate notices for the *Intelligencer*. The previous year, a woodcut of the butterfly *Argynnis lathonia* (Queen of Spain Fritillary) was included 'with a view to preventing further erroneous announcements of the capture of this rarity', helpfully pointing to the silver spots on the hind wings that 'should enable the "merest tyro" to recognise it'.<sup>12</sup>

The periodical was only useful if the information it circulated therein could be relied upon, so it makes sense that Stainton would wish to train the observational skills of his readers to ensure this. However, identifying an insect was only one element in the process of producing specimens. Although this chapter is not intended to provide an exhaustive account of natural history collecting methods, it is necessary to give some indication of how specimens were created, as this demonstrates the complex range of techniques and considerations that were involved.

### 'Common Practice'

David Allen writes 'of all the branches of natural history [entomology is] the one most cluttered with unavoidable equipment'.<sup>13</sup> At a push, some improvisation would suffice, as in the case of the 'poor man' who captured a *Sphinx convolvuli* 'with his hat' at Herne

<sup>12</sup> *Intelligencer*, 3 (1857-58), p. 43.

<sup>13</sup> David Elliston Allen, *The Naturalist in Britain: A Social History* (London: Allen Lane, 1976), p. 150.

Bay, recorded by E. D. Butler of Brompton Square, South Kensington.<sup>14</sup> It was not specified as to whether this impromptu method was required due to the captor's impecunious state, or simply because he had left his net at home. Top hats remained *de rigueur* headgear for entomologists long after they had passed out of wider fashion, as they served as convenient receptacles for pinned insects when lined with cork.<sup>15</sup> Much of the more specialised apparatus employed by entomologists in the mid-nineteenth century was largely unchanged from that used by their eighteenth-century antecedents. A woodcut from the *Entomologist's Text Book* (1838, fig. 2.2), by John Obadiah Westwood, gives an excellent example of the most common equipment used by entomologists in this period.

There is the question of where collecting actually took place. The terms 'field' and 'fieldwork' are invoked somewhat anachronistically here, as these words were not used by Stainton and his contemporaries within the pages of the *Intelligencer*. The term 'field naturalist' was coined in the 1830s, but 'field science' only came into parlance from the 1870s onwards, as laboratories became increasingly ubiquitous across all scientific disciplines (rather than the strict preserve of chemists), necessitating a distinction to be drawn between markedly different sites of practice.<sup>16</sup> Nevertheless, 'the field' remains a useful, catch-all category for the myriad places and spaces in which specimens were collected. Insects can occur anywhere, but the richest hunting grounds were generally wooded areas, hedgerows, and heaths or moorland. It was often recommended that a single collector 'confine his attention to one piece of ground, trying it every way'.<sup>17</sup> This again points to the highly localised nature of entomological practice, with practitioners often possessing deep knowledge of a specific area. As described in the last chapter, the Sheffield razor grinder James Batty's favoured hunting ground were the woods near Maltby. Stainton related how he was pestered by correspondents asking 'whether such and such localities are good', to which he responded 'it is *the person* and not *the place* that makes a good locality'. The Hammersmith Marshes had a great reputation, but only due to the 'continuous exertions of Mr [James Francis] Stephens', likewise 'if Mr [Henry] Doubleday had not lived at Epping we should never have heard of Epping as a

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<sup>14</sup> *Intelligencer*, 6 (1859), p. 179.

<sup>15</sup> Allen, *Naturalist in Britain*, p. 153.

<sup>16</sup> Robert E. Koehler and Jeremy Vetter, 'The Field', in *A Companion to the History of Science*, ed. by Bernard Lightman (Chichester: John Wiley, 2016), pp. 340-355 (p. 340).

<sup>17</sup> Stainton, *Companion*, p. 5.

locality for insects'.<sup>18</sup> This demonstrates the embeddedness of localised knowledge and skill in the practice of entomology. One correspondent recorded a particularly productive visit to Sherwood Forest, recommending both the 'Jug and Glass' inn, and also 'a gentleman living here (Mr Tudsbury) who takes an interest in showing the different localities in the Forest'.<sup>19</sup>

As demonstrated by the mystified onlookers described by Stainton at the beginning of this chapter, many who engaged in insect collecting (or indeed natural history collecting of any sort) were often met with by confusion, if not outright hostility. As a consequence of the 1831 Game Act, which remains in force to the present in an amended form, there are numerous accounts of naturalists being mistaken for poachers and even fired upon by zealous gamekeepers. J. W. Douglas, a character to whom this chapter will return, recalled an altercation with one such 'feudal retainer', who warned him that 'trespassers would be prosecuted, and all dogs would be shot', leaving the insect-hunter 'dreadfully alarmed, not knowing which of the two punishments was to be my fate'.<sup>20</sup> Richard Weaver, a Birmingham shoemaker who became a well-known collector, noted in 1856 that there was 'a poor chance of finding larvae of *Gastropacha ilicifolia* on Cannoch Chase', owing to the chase-keeper hounding anyone from among the bilberries preserved for game.<sup>21</sup> Those in pursuit of nocturnal insects, particularly moths, placed themselves in the greatest danger of misunderstandings, as this necessitated spending the hours of darkness roaming suspiciously through the trees and undergrowth. The *Intelligencer* records one such instance, reproduced from the *Sussex Advertiser*. Mark Richards, a 'keeper in the service of Mr Lewis Lloyd', was charged with the assault of David Thomas Button 'a decorative painter at Peckham Rye, and also an entomologist'. Button had been passing through 'Addington Wood [...] on the evening of the 14th of April. He had a lantern in one hand and a stick in the other, being in search of insects'. On cross-examination, Button described how 'he had a white handkerchief on the top of a stick he was carrying that evening, for the purpose of catching insects flying in the air, a very common practice'. It appears that he had strayed (unwittingly or otherwise) from the estate owned by the Archbishop of Canterbury, where he was permitted to be, and onto the land of Lloyd, who 'did not want persons to

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<sup>18</sup> *Intelligencer*, 6 (1859), p. 98.

<sup>19</sup> *Intelligencer*, 10 (1861), p. 188.

<sup>20</sup> *Intelligencer*, 6 (1859), p. 62.

<sup>21</sup> *Intelligencer*, 1 (1856), p. 187.

study insects on his ground'. Observing this, Richards challenged Button, and a scuffle ensued, though it is impossible to verify exactly what occurred. There were two other witnesses - an ivory-turner named Alfred Harper and 'a naturalist' called William Shrosbree - both of whom were probably friends of Button, as their testimonies were not favourable to Richards. The gamekeeper was found guilty and fined accordingly, though Button was reprimanded for trespassing. In his defence, Button argued 'it was most important for the successful study of insects that he should watch their habits at night'.<sup>22</sup> This anecdote gives some idea of the very basic equipment utilised by some collectors - a stick and a handkerchief serving as a net - which Button characterised as a 'common practice'. Furthermore, it illustrates that fieldwork in the nineteenth-century British countryside could be complicated and potentially dangerous. In accessing the natural world, collectors could not necessarily escape the bounds of class.

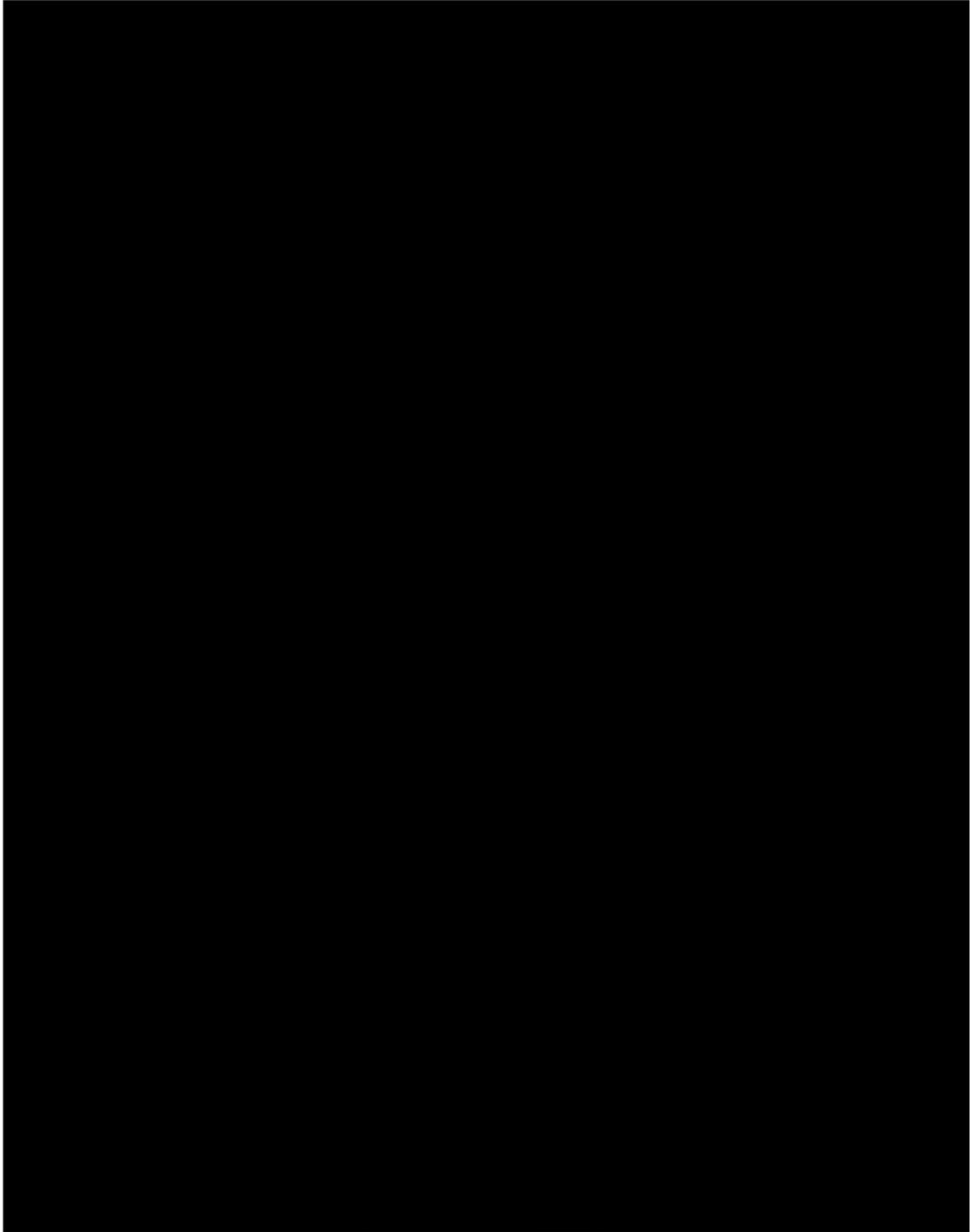
### **'Contentious Sugarers'**

The methods of capturing an insect are almost as varied as the creatures themselves. As observed by William Kirby, an early nineteenth-century doyen of entomology, 'some will be *reposing*; others *feeding*; others *walking* or *running*; others *flying*; others *swimming*; others *lurking* in various places of concealment, and in *different* states of existence'. The diligent entomologist must therefore 'be prepared with means of coming at and capturing them under all these circumstances'.<sup>23</sup> Capturing a butterfly, for example, requires a very different set of skills to catching a beetle. To further complicate matters, the lifecycle of an insect involves distinct phases in which their appearance and habits are entirely dissimilar, each necessitating a different approach by those searching for them. In the case of Lepidoptera, collectors were interested in examples of all three stages: the larvae (i.e. caterpillars), the pupae (undergoing metamorphosis), and the imago (the fully mature butterfly or moth). Capturing an imago insect, particularly Lepidoptera, generally involved the use of a net, as can be seen in a plate (figure 2.3) taken from the anonymously authored *History of Insects* (1839), published by the Religious Tract Society. Alternatively, a technique known as 'sugaring' could be used, in which a tree trunk was smeared with a mixture of treacle, brown sugar, and alcohol to lure unsuspecting moths. This was a method first developed

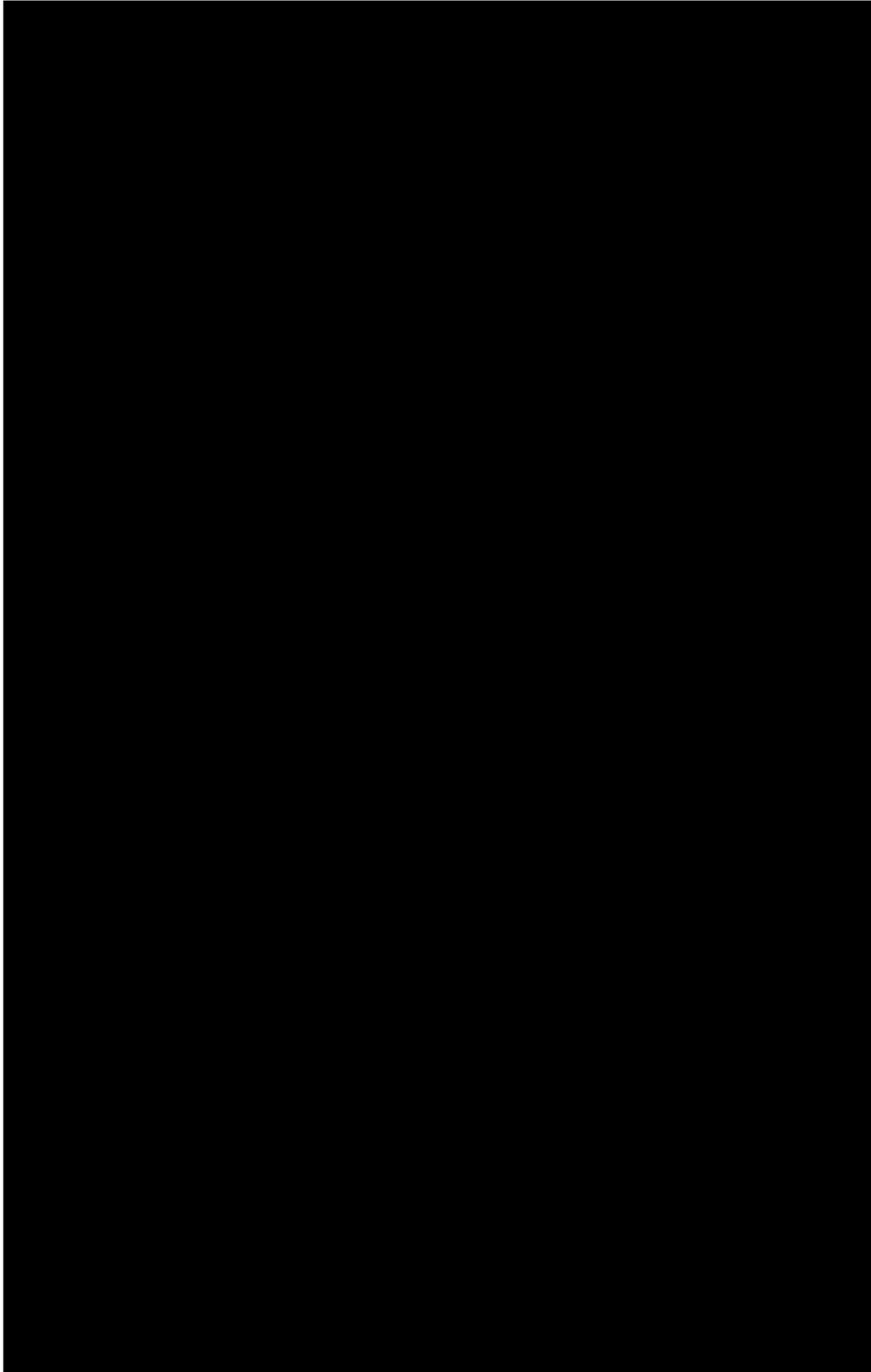
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<sup>22</sup> *Intelligencer*, 10 (1861), pp. 38-39.

<sup>23</sup> William Kirby and William Spence, *An Introduction to Entomology, or, Elements of the Natural History of Insects*, 4 volumes (London: Longman et al, 1818-26), IV (1826), p. 515.



**Figure 2.3** 'Capturing Insects', *History of Insects* (London: Religious Tract Society, 1839), frontispiece. The man in the top hat is using a flap-net to catch a butterfly in flight, while the boy at his feet uses a sweeping net in the water. On the left, you can see some gauze forceps and boxes of captured insects.



**Figure 2.4** Abel Inghen, *Instructions for Collecting, Rearing, and Preserving British and Foreign Insects* (London: William Smith, 1839), plate 1. This shows various insects in the process of 'setting', a vital step in preparing specimens. The wings and legs are held in place by a combination of pins and card until the insect has dried and set into position. They are then ready to be mounted for display.

by two brothers, the Quaker grocers Henry and Edward Doubleday, the latter bringing it to the attention of the wider insect collecting community through a short and seemingly innocuous notice published by the *Entomological Magazine* in 1832. They described their technique as follows:

It is simply to lay a sugar-hogshead, which has just been emptied, and to which of course some small quantity of sugar will still adhere, in an open space near a garden or field. In the course of the night or two it will be visited by numbers of Noctuae, amongst which will not unfrequently be found some of the rarer species.<sup>24</sup>

In the words of Stainton, this caused a 'revolution' in the cabinets of entomologists, as species previously considered rarities were found to be in abundance.<sup>25</sup> Since this initial notice, other entomologists continued to develop and refine their practice of sugaring, with many individuals concocting their own unique recipe in the hope of attracting greater numbers or different species of moth. It was apparently in such widespread use by 1860 that a correspondent to the *Intelligencer* begged Stainton to lay down some 'Laws of Sugaring', in order to avoid disputes amongst entomologists. In the North of England, 'near our manufacturing towns, trees are scarce and entomologists are plentiful; the first comer sugars a whole row of trees, *the only row for miles*', thereby leaving all those who come after him devoid of suitable sugaring spots. Stainton's only advice for 'contentious sugarers' was to 'cultivate more friendly feelings to one another and not become selfish'.<sup>26</sup>

Once an insect had been caught and conveyed to the collector's home, there remained the business of killing and 'setting', which completed the transition from living creature to specimen. Stainton's favoured method for killing Lepidoptera involved bruised laurel leaves in a sealed jar, poisoning the insect with prussic acid and leaving it intact. Others used alternative chemicals, as one correspondent described a chance meeting with an entomological 'brother' in a druggist's shop, where the latter had entered with a copy of the *Intelligencer* under his arm and enquired after methylated chloroform.<sup>27</sup> Many less squeamish collectors used a red-hot pin driven through the thorax. Once the insect was

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<sup>24</sup> *Entomological Magazine*, 1 (1833), p. 310.

<sup>25</sup> Henry Tibbats Stainton, *Manual of British Butterflies and Moths*, 2 vols (London: John Van Voorst, 1856-59), I, p. 169.

<sup>26</sup> *Intelligencer*, 8 (1860), pp. 153-154.

<sup>27</sup> *Ibid.*, p. 29.

dead, the process of 'setting' involved laying out Lepidoptera or other insects to dry and become rigid. This was a tricky and important part of the process, as it was vital to set the specimen in such a way that preserved it for future examination. A plate from Abel Inghen's *Instructions for Collecting, Rearing, and Preserving British and Foreign Insects* (1839, fig. 2.4) nicely illustrates the variety of ways that different types of insect were laid out using pins and cardboard to ensure they attained the correct form once the process was complete. Stainton noted in the 1855 *Annual* that 'the variety of apparatus that has been invented for this purpose would be rather puzzling to a beginner'.<sup>28</sup> In the case of Lepidoptera, a number of different 'setting boards' could be used to manipulate and hold the wings in place, with the choice informed by the individual collector's tastes and motives. There were some who preferred to curve the wings, giving the insect 'a graceful and pleasing appearance, but surely not a natural one'. A flat board was employed by European entomologists, and Stainton points out that this was 'absolutely essential' for many genera, 'or the collector must despair of having his specimens named, as the characters frequently lie in the very tip of the cilia [fine hairs along the edge of the wing]'.<sup>29</sup> This exposes the tension between aesthetics and the necessities of science, which also came into consideration when arranging specimens for display. A collector hoping to create a visually impressive collection may be tempted to arrange by size and colour, regardless of species or other considerations. A more scientifically inclined collector, however, would wish to carefully label each of his specimens and arrange them more systematically. Once a collector had amassed his specimens, the work continued, as preserving specimens from the depredations of pests such as mites required vigilance, judicious use of camphor crystals, and specialist cabinets for those who could afford them.

Butterflies and moths were not only of interest in their full adult form, as the conscientious entomologist would wish to observe each species in all stages of its lifecycle. Furthermore, allowing a larva to develop into a butterfly or moth was a simple way to ensure perfect, unharmed specimens, as it avoids any damage that may occur in pursuing and capturing fully mature insects in the field. During the winter months, when many Lepidoptera pupated underground beneath trees and other hedgerows, 'pupa digging' was a way many collectors employed themselves when other insects were scarce. Breeding Lepidoptera from the egg required an entirely different set of skills and

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<sup>28</sup> *Entomologist's Annual* (1855), p. 23.

<sup>29</sup> *Ibid.*, p. 23.

practices, often varying greatly from species to species. It was delicate and skilful work, requiring close attention and perseverance, as small fluctuations in temperature or any number of other variables could mean the difference between success and failure. In an editorial entitled 'Eggs', Stainton explained the value of such work. 'The importance of eggs can scarcely be overrated', as through this process 'many species have been reared of which the larvae were previously unobtainable and unknown'. 'To obtain fertilised eggs of a scarce insect is the great object of many of our most successful breeders. Once let them obtain the means of rearing ad infinitum any rarity, and it is a rarity no longer'. More importantly (at least in Stainton's view), it furthered scientific understanding by offering an opportunity to 'study [the larva's] habits and record its appearances'.<sup>30</sup>

Through the efforts of his readers, Stainton hoped that many more unknown larvae could be discovered and recorded. He noted:

We have lately received from Mr Wilkinson, of Scarborough, larvae of *Lithocolletis amyotella* and of *Butalis incongruella*, reared from the egg, and we expect shortly to receive other hitherto unknown larvae from the same quarter.

We think it would be highly desirable if Mr Wilkinson would publish some account of his modus operandi in obtaining eggs of these Micros; we presume some attention must be devoted to keeping the eggs moist, for with regard to those species of which the food is unsuspected the treatment of the infantine larvae must be rather puzzling.<sup>31</sup>

In the example of Mr Wilkinson, we have a demonstration of how scientific knowledge was being produced through the *Intelligencer*. A single entomologist, through experimentation (and possibly a little luck), had succeeded in developing a method by which to produce specimens that could then be circulated. The technique by which he produced these specimens was also important information that Stainton wished to make public through the periodical. Given the potential value of rare specimens raised from the egg, Stainton was of course assuming that Wilkinson's devotion to science was greater than his desire for financial gain. G. H. Wilkinson was secretary for the

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<sup>30</sup> *Intelligencer*, 8 (1860), p. 185.

<sup>31</sup> *Ibid.*, pp. 185-186.

Northern Entomological Society, sending reports of their meetings to the *Intelligencer*, so it is reasonable to assume he had some dedication to the study of insects.<sup>32</sup>

One of the most successful breeders of Lepidoptera from the egg was Emma Hutchinson (born Emma Gill, 1820-1905), who became renowned for her skill at rearing insects from the egg. She bred successive generations of a moth known as the Pinion-spotted Pug (*Euthecia insigniata*) for thirty-one years, from 1874 to her death.<sup>33</sup> Despite corresponding with Stainton and other eminent entomologists such as Edward Newman and Henry Doubleday, she unfortunately published very little. The value of Hutchinson's work can be seen in the weighty nine-volume reference book, *Larvae of the British Butterflies and Moths*, by the entomological artist William Buckler (1814-84). This was published posthumously from 1886 to 1901, edited by Stainton until his death in 1892 and subsequently by George Taylor Porritt. As the title implies, it was intended as an exhaustive and fully illustrated textbook on the larvae of all species in Britain. Hutchinson was referenced throughout as the provider of many of the eggs and larvae from which Buckler made his observations, along with much supplementary information regarding the habits of each species.<sup>34</sup> This demonstrates that the lack of women evident in many periodicals should not be taken as representative of entomology and natural history as a whole, even if it is more difficult to recover the practices of these individuals as a result.

### **Division of Labour**

The collaborative process through which exhaustive entomological lists and textbooks were produced was a long-established method. The very first time Charles Darwin's name was featured in print, it was as the captor of a beetle in James Francis Stephens's *Illustrations of British Entomology* (1828-46).<sup>35</sup> However, Stainton's innovation was to utilise the periodical as a medium through which to recruit observers and collectors that could provide him with the evidence required for his own work, the *Natural History of the Tineina* (1855-73). This highly specialised work aimed to be an authoritative account on a specific taxonomic section of the Lepidoptera, giving precise descriptions

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<sup>32</sup> *Intelligencer*, 10 (1861), pp. 29-30 and 172-173.

<sup>33</sup> *Entomologist's Monthly Magazine*, 42 (1906), p. 43.

<sup>34</sup> William Buckler, *Larvae of the British Butterflies and Moths*, 9 vols (London: Printed for the Ray Society, 1886-1901). For examples in volume one, see: pp. 30, 57, 182, and 184.

<sup>35</sup> James Francis Stephens, *Illustrations of British Entomology*, 10 vols (London: Baldwin & Cradock, 1828-46), [Mandibulata] III (1830), p. 266.

of their appearance, habits, and lifecycle. Stainton had been delayed in completing it, 'owing to a paucity of discoveries of the transformations of species [i.e. the change from an egg, to larva, to moth]'. To remedy this, he placed a notice in the very first issue of the *Intelligencer*, listing the species whose 'preparatory states' he was 'entirely unacquainted' with. To encourage his readers, he promised:

Any one who shall first discover and communicate to me the transformations of twenty such species, will be entitled to receive *gratis* a copy of the entire series of the *Natural History of the Tineina*.<sup>36</sup>

Despite all his resources, Stainton would have been physically unable to devote the time and energy to collecting and breeding all these larvae by himself. Like any established gentleman of science, his network of correspondents was extensive, and not limited to Britain. His detailed and methodical notebooks record that he received vast numbers of specimens from European entomologists.<sup>37</sup> However, this had clearly proved insufficient for such a large undertaking as the *Tineina*, requiring him to cast his net wider. In exchange, he was offering something of considerable value, with a complete set of the *Natural History* eventually running to thirteen volumes, with the first two costing 12s. 6d. each (the equivalent of 150 issues of the *Intelligencer* at 1d each).<sup>38</sup>

This clearly proved to be successful, as Stainton continued to publish such notices in the *Intelligencer* throughout its entire run. He gave yearly updates on progress through the *Entomologist's Annual*, devising a scoring system through which he kept count. Stainton listed the 'three distinct steps the discoverer has to make':

The first, and most important, is the discovery of the larva.

The second is the *sending* of the larva to me, in order that it may be duly figured and described.

The third is the *rearing* of such larva through its transformations, so as to ascertain the perfect insect produced from it.<sup>39</sup>

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<sup>36</sup> *Intelligencer*, 1 (1856), p. 4.

<sup>37</sup> Henry Tibbats Stainton, Notebooks and Registers of Specimens (1848-90), London, Natural History Museum, MSS STA 15-18:20.

<sup>38</sup> *Intelligencer*, 3 (1857-58), p. 64.

<sup>39</sup> *Entomologist's Annual* (1857), p. 160.

Very often, each of these stages would be achieved by a different individual. The list of those who contributed gives us an opportunity to see how effective Stainton's tactics were. It is notable that the greatest amount of assistance he received came from abroad, though this is understandable, given that there was a far greater number of European species which were unknown to him. However, Stainton remarked of his first list that 'it is very gratifying to observe that the assistance in this country [Britain], which used to be exclusively confined to three or four Entomologists, is not gradually diffusing itself among a greater number'.<sup>40</sup> The number of contributors continued to grow, albeit slowly. In a later update, Stainton emphasised the need for '*new observers in new localities*'.<sup>41</sup> He was aware of the extent to which localised knowledge was vital in acquiring comprehensive coverage, and establishing a network in such a way as this was vital to collate this knowledge into a unified whole.

The periodical proved to be a particularly effective site through which this collective process was mediated. To illustrate this point, Stainton employed a metaphor based on the manufacture of pins, which were a vital tool utilised by all those who collected insects. He begins with a quote from Andrew Ure's *Dictionary of Arts, Manufactures, and Mines* (1839):

'The pin manufacture is one of the greatest prodigies of the division of labour; it furnishes 12,000 articles for the sum of three shillings, which have required the united diligence of fourteen skilful operatives.' In like manner we frequently find that it takes the collective observation of several entomologists to discover the habits, &c., of one larva. One finds the larva, another discovers its food, and a third rears it.<sup>42</sup>

Here, Stainton explicitly compares the industrial processes that had revolutionised society with the process of producing scientific knowledge, suggesting that division of labour was the most effective way in both cases. When read in the light of Stainton's attempts to encourage entomology among the working classes, this metaphor takes on an additional resonance - as these were the very people who had first-hand experience of this alteration in labour.

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<sup>40</sup> Ibid., p. 162.

<sup>41</sup> *Entomologist's Annual* (1859), p. 165.

<sup>42</sup> *Intelligencer*, 8 (1860), p. 193.

This observation had been prompted by the recent discovery of a particularly remarkable larva, bearing a portable protective case, that had been remarked upon in an early issue of the *Intelligencer*. It had first been observed by Professor Philip Zeller, who had spotted it whilst sat eating his lunch on an entomological perambulation. Stainton had issued a challenge, 'can any of our readers find such a thing?'.<sup>43</sup> Four years later, a Mr Scott had done so, but the larva in question remained unidentified in terms of species and genus. However, through the efforts of a European correspondent 'Herr Hofmann' and Mr Wilkinson, the larvae were acquired and reared, allowing Mr Scott to supply 'the last missing link in the chain of evidence'. The larva was recognized as belonging to a moth with the specific name *Incongruella*, a reference to the unusual nature of the adult, which was 'discordant from everything else'.<sup>44</sup> This moth is now known as *Amphisbatis incongruella*, but was originally named *Butalis incongruella* by Stainton himself in 1849. The larva builds a portable case out of grass or other vegetation, and it was this particular feature that had captured the attention of Professor Zeller during his meal. The juvenile form of this species had remained unknown until the collective efforts of the *Intelligencer's* readers combined to solve the mystery.

The periodical, therefore, became a central part of Stainton's scientific practice as an entomologist, allowing him to extend the reach of his collecting net. However, he was not the only one to benefit from this enlarged network of collectors, as the periodical afforded its readers the opportunity to participate in the circulation of specimens for their own benefit as well the editor's.

### **Caterpillars in the Penny Post**

'Caterpillars [...], if well packed in trustworthy boxes, will pass safely enough through the tender mercies of the Post Office'. This was the advice Stainton gave to one of the *Intelligencer's* correspondents, who had received the following notice:

A *Packet* addressed to *you* containing *Caterpillars* [*sic*], has this day been destroyed in the Returned Letter Branch of this Department, it being contrary to regulations to allow such matter to circulate through the Post Office.

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<sup>43</sup> *Intelligencer*, 1 (1856), p. 113.

<sup>44</sup> *Intelligencer*, 8 (1860), p. 194.

This came in the form of a ready-printed note with the handwritten addition of the words marked in italics. Stainton suggested that the caterpillars were not destroyed because they were sent by post, but rather 'because being so sent they got loose, and of course it would never do to have caterpillars at large in the letter-bags'. Careless packaging of specimens was seemingly common, as he often received 'squashed chip-boxes from *ignoramus*'. Furthermore, Stainton speculated that if the larvae of this particular species (*Lasiocampa rubi*) were 'incautiously handled', they may irritate 'the sensitive skin of some of the letter-sorters'.<sup>45</sup> Understandably, the indignation of the Post Office and destruction of the caterpillars would be the inevitable result.

An insight into the reasons Stainton embarked upon producing the *Intelligencer* is provided by a letter he published in the *Zoologist* in December 1855, around four months before he began his own periodical:

I have several years been in the habit of sending lists of my duplicates to my correspondents, which I have found a long, tedious and sometimes thankless operation (on one occasion an eminent entomologist abusing me for sending him a list of my duplicates), and it will be a great convenience to me if my list appears in print this year in the pages of the *Zoologist*.

In much the same way that periodicals could be said to industrialise the practice of correspondence, this demonstrates that a similar process could be applied to the exchange of specimens, by which collectors could trade their surplus specimens ('duplicates') with those of other practitioners. Rather than the laborious task of conducting these transactions via personal correspondence, the periodical rendered this task more efficient. The timing of this letter by Stainton is highly suggestive, and it seems likely a desire for such a system was the one of his primary motivations for establishing the *Intelligencer*.

Nineteenth-century entomologists were frequent customers of the Post Office. Stainton once remarked that 'scarcely a day passes during the season that the post does not bring me living larvae of some sort or other'.<sup>46</sup> Reading through any volume of the *Intelligencer*, it becomes apparent that a considerable number of specimens (both living and dead) passed through the mail each year. Stainton's notebooks and specimen

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<sup>45</sup> *Intelligencer*, 9 (1860-61), p. 49.

<sup>46</sup> *Zoologist*, 14 (1856), p. 4954.

registers record the vast number of European specimens received through the post from entomologists on the Continent.<sup>47</sup> Unfortunately, his extensive and meticulous records do not provide any similar information regarding specimens received from British correspondents. Stainton was luckier than most, however, in that he could afford the time and expense of frequent collecting trips beyond the environs of his home. The collecting activities of many others were more limited. The ability to exchange specimens with other British entomologists was, therefore, of great value, as Stainton explained in the *Entomologist's Annual*:

The Entomologist who lives in Sussex will never meet with *Erebia blandina*, though he collect for fifty years; the Entomologist located in Argyllshire may be equally certain he will never there meet with *Limenitis sibilla*. Now if the one collector meet with more *Sibilla* than he can use, he may as well give them away; and if the Argyllshire Entomologist meet with more *Blandina* than he wants, he will, in like manner, be no poorer from parting with what is a superfluity with him - yet each will be a gainer by the exchange.<sup>48</sup>

An anonymous correspondent to the *Intelligencer* expressed feelings that were undoubtedly shared by many who availed themselves 'of the means your pages offer for obtaining - honourably obtaining - species we never can expect to get in any other way'. He continued, 'this may be of little importance to those who can travel when and whither they list', but it was of far greater significance

To those who by great diligence and patience can procure only the species common in their neighbourhood, perhaps a village or heath, and who have always thought that what they have captured and prepared by great painstaking is a fair exchange for species caught under similar circumstances by others in distant places.<sup>49</sup>

Stainton envisaged periodicals such as the *Annual* and later the *Intelligencer* as facilitators of this network of exchange. The *Intelligencer* in particular was suited to this, as it allowed for correspondents to advertise items in their collections that they were willing to trade. Typically, these would be duplicates within their collection, and

<sup>47</sup> Stainton, Notebooks, MSS STA 15-18:20.

<sup>48</sup> *Entomologists Annual* (1856), p. 12.

<sup>49</sup> *Intelligencer*, 10 (1861), p. 181.

advertisements would very often include lists of 'Desiderata', essentially a wish list of desired species. This was the form followed by the 12-year-old Edwin Ray Lankester, the future zoologist and director of the Natural History Museum, who wrote a letter to the *Intelligencer* in October 1859:

Having caught a few specimens of *Colias Edusa* and two or three of the variety *Helice*, while at Ventnor, in the Isle of Wight, during this summer, I take the opportunity afforded by your columns to express my wish to exchange them with any of your subscribers who may be in want of them. Being a beginner, my wants are very numerous.

This was followed by a considerable list of desired species, with the added caveat that 'although I am a beginner I should wish the insects sent to me to be well set'.<sup>50</sup> The Savile Row address may have suggested this was a correspondent of a certain class, though there is nothing to indicate this letter was written by a precocious schoolboy. His desire for the specimens to be 'well set' was something echoed by many collectors in the pages of the *Intelligencer* and other periodicals, pointing to the standards that were expected amongst the community and the value of such skills. Exchange became intrinsically linked with the periodical, as an 1892 article on Stainton in the *British Naturalist* noted that the 'dear old' *Intelligencer* 'helped, if indeed it did not make, the system of exchange, and gave a wonderful impetus to the study [of entomology]'.<sup>51</sup>

After the completion of the *Intelligencer's* first volume in September 1856, Stainton ceased publication until March of the following year. Over these winter months, when insect populations plummeted and the collecting activities of most entomologists were therefore slowed or entirely halted, he did not consider it necessary to continue the recording of captures. However, into the *Intelligencer's* place stepped the *Substitute; or Entomological Exchange Facilitator, and Fire-side Companion*, conducted and edited with Stainton's blessing by his friend J. W. Douglas. As its title suggests, the *Substitute* offered a replacement in the absence of the *Intelligencer*, and afforded entomologists a forum through which specimens could be exchanged. This again demonstrates the close relationship between publications and fieldwork, with the periodical being contingent on the seasonality of collecting. In subsequent years, the growing success of the *Intelligencer* led Stainton to continue its publication throughout the winter months

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<sup>50</sup> *Intelligencer*, 7 (1859), p. 13.

<sup>51</sup> *British Naturalist*, 2 (1892), p. 44.

without the need for a *Substitute*, as sufficient material was afforded through exchanges and the different kinds of collecting that still occurred during this time (confined mainly to the capture of hibernating pupae). With space at a premium within these periodicals, and entomologists presumably eager to minimise the cost of their adverts, a shorthand developed. Correspondents would refer to the Appendix of Stainton's *Manual of British Butterflies and Moths*, in which species were listed and assigned a number. Taxonomy remained a thorny issue at this time, but this ensured a certain degree of standardisation by ensuring that collectors were acquainted with Stainton's work and the system he favoured.

Collecting was part of 'a complex process' through which the standards for specimens were 'simultaneously set and enforced'.<sup>52</sup> In order for a collector to participate in the exchange of specimens, they were required to learn the conventions of specimen preparation. Anyone who was unable to correctly identify, set, or preserve specimens was at risk of exposure in the columns of a periodical, thereby forfeiting the possibility of further transactions. The desire for specimens in the best possible condition was a primary motivating factor for Stainton's wish to receive caterpillars (rather than imagos) by post, as he explained:

The advantages attending the transmission of insects by post whilst in the larva or pupa state is obvious; they travel more safely, and by breeding and setting the perfect insects I can frequently obtain finer specimens than by trusting these processes to the tender manipulations of less-practised micro-lepidopterists.<sup>53</sup>

The preparation of specimens was a delicate task, particularly with regards to the microscopic moths Stainton was most concerned with. Any mistake in preparing the insect for display could destroy or obscure vital features that are used to determine the species, and thereby render the resultant specimen useless from a scientific perspective.

Even among eminent entomologists, the differences in techniques could cause friction. A correspondent to the *Intelligencer*, 'One Who Wishes To Please', called for some consensus in the uniformity of setting insects, having received conflicting guidance from a number of collectors he considered to be highly esteemed. He

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<sup>52</sup> Endersby, *Imperial Nature*, p. 55.

<sup>53</sup> *Zoologist*, 14 (1856), p. 4954.

complained that having sent 'A.' a box of insects, he immediately received a letter in reply criticising his methods and informing him that his unfortunate specimen had been thrown on the fire in disgust. Having thanked A. for his warning, he sent another specimen to 'B.', following A.'s advice. B. in turn replied that he was dissatisfied with the pinning, and consigned the specimens to the slop-basin ('as I was at breakfast'). Further correspondents, 'C.', 'D.', and 'E.', all proved equally unhappy.<sup>54</sup> In another letter, a Mr W. H. Latchford issued the following warning to the 'clumsy and careless':

I lately had a box of insects sent me from the country, upon opening which I found, to my disgust, that it contained some thousands of mites instead of the insects I had been so anxiously expecting. What was I to do with them? Why I burnt them, box and all, and made a note in my book of correspondence, so that I may guard against such careless collectors another time, - I call them 'collectors', for I cannot reckon them amongst entomologists.<sup>55</sup>

Here, Latchford draws a distinction between 'collectors' and 'entomologists', his derisive tone making it clear that he considered the former to be inferior. This was a judgement based upon an apparent lack of skill and expertise on the part of the collector, who was unable to preserve and package specimens correctly, and was consequently excluded from further correspondence. In order to attain the higher status of 'entomologist', at least in the eyes of Latchford, a collector had to demonstrate a certain level of competence. There was, therefore, a direct link drawn between the attainment of the craft aspects of specimen collecting and scientific credibility. This apparent divide between entomologists and 'mere' collectors is one we shall return to in the next chapter.

Rather than cultivating an extensive network of correspondents, exchange columns allowed collectors to broadcast their finds in a far quicker and more convenient way, greatly increasing the likelihood of a beneficial transaction taking place. As with the correspondence discussed in the previous chapter, exchange on this scale only became possible in the mid-nineteenth century thanks to the introduction of the Uniform Penny Post in 1840. The charge of one penny applied to all items under half an ounce in weight. As the weight doubled, so did the price (i.e. twopence for one ounce, fourpence for two ounces, etc). As insects are very small and light, sending them via post would

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<sup>54</sup> *Intelligencer*, 9 (1860), pp. 108-109.

<sup>55</sup> *Intelligencer*, 5 (1858), p. 46.

have been relatively inexpensive. Furthermore, in the case of live specimens such as caterpillars, speed was of the essence if they were to arrive in their recipient's hands before they underwent the next stage of their transformation (or even worse, died in transit). Stainton gave the following advice on preparing parcels for the vicissitudes of the nineteenth-century post:

With larvae the matter is very simply, as all that is necessary is to place them in a small tin box, with some of the proper food, and wrap up the box in paper and direct it; perfect insects, however, require to be handled with more caution - and in the first place they should be carefully pinned into a small, *light, yet strong* corked wooden box, and those which had large bodies should have them carefully pinned down by two or more pins going crossways over the body; the box should then be carefully wrapped up in several thicknesses of cotton-wool, and then enclosed in paper; the object of the cotton-wool is to prevent any jar to the insects when the box is being stamped in the post-office, as without the precaution the first stamp it received would probably dislodge several bodies, which would then amuse themselves with knocking off the legs and antennae during the remainder of the journey. Sometimes, with all our care the box arrives at its destination squashed, and then it affords a capital opportunity of testing the serenity of our correspondent's temper, and his equanimity under trying circumstances, and if he writes a very fierce remonstrant letter the answer naturally suggest itself, 'Absurde facis, qui angas te animi [You act absurdly in distressing yourself in mind]'.<sup>56</sup>

The impact of the penny post upon the practice of natural history was immediately apparent to contemporaries. The earliest historian of the postal service, William Lewins, recorded the following testimony by John Steven Henslow, the distinguished professor of botany who had mentored Charles Darwin at the University of Cambridge.

To the importance of the penny postage to those who cultivate science, I can bear most unequivocal testimony, as I am continually receiving and transmitting a variety of specimens by post. Among them, you will laugh to

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<sup>56</sup> *Entomologist's Annual* (1855), pp. 14-15.

hear that I have received three living carnivorous slugs, which arrived safely in a pill-box!<sup>57</sup>

Examining this exchange of natural history specimens serves a number of purposes. It demonstrates how periodicals played an active role in this scientific practice, giving voice to the many insect collectors who participated in the circulation of scientific knowledge during this period. Furthermore, the practice of collecting raises important questions regarding membership of the community represented in the *Intelligencer*. As the previous chapter has shown, it is wrong to ascribe fixed concepts of 'high' and 'low' science to natural history in this period, and the practices of collecting and exchange cut across any such distinction. However, this is not to say that the community did not attempt to define acceptable practice, thereby negotiating who could participate and who should be excluded. On the contrary, the *Intelligencer* raised significant questions regarding how entomology should be conducted, and this was fundamentally a question of trust. Studying how correspondents tackled this concern gives us an insight into how these practitioners fashioned their identities, both individually and collectively.

### **The Tale of Young Barnes**

The tale of 'Young Barnes' was a piece of fiction written by Stainton and serialised over several numbers of the *Intelligencer*, taking the place of a leading article in each. This may seem incongruous in a periodical otherwise devoted to natural history, but reflects the ways in which many of his readers would have been accustomed to reading stories and poetry alongside factual articles in the general magazines of the period. Stainton himself was an active consumer of the latest novels, often referencing the works of Charles Dickens in his editorials. Writing in the 1856 *Entomologist's Annual*, for instance, he noted:

It is difficult to take up any work of our greatest literary characters, without finding some allusion either to Entomology or Entomological pursuits; even in the first number of *Little Dorrit*, Mr Meagles states in reference to his dread of the plague while in quarantine at Marseilles, - 'Why, I'd as soon have a spit through me, and be stuck upon a card in a collection of beetles,

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<sup>57</sup> William Lewins, *Her Majesty's Mails: An Historical and Descriptive Account of the British Post-Office* (London: Sampson Low, Son, and Marston, 1864), pp. 135-136.

as lead the life I have been leading here'; and Bulwer-Lytton, in the *Caxtons*, devotes a whole chapter to the earwig.

Stainton could not restrain himself from playfully correcting Dickens, noting that beetles that are pinned are not mounted on cards (and *vice versa*), though he allows for the fact that 'in Mr Meagles' time it may have been different'.<sup>58</sup>

Stainton's first (and only) attempt at writing fiction of his own told the story of the thoroughly unpleasant eponymous character, 'a greedy boy', who 'never saw any one else with anything nice but immediately wanted to have it himself'.<sup>59</sup> At first, Barnes swindles his schoolfellows out of penknives and pencil cases, before an interest in entomology leads him to covet the rarer specimens collected by others. In order to attain a 'Green Hair Streak' (the only green-coloured butterfly that occurs in Britain) captured by another boy, he manufactures a supposedly unknown (and therefore valuable) specimen by altering the wings of a more common species with a pair of scissors.<sup>60</sup> He compounds this felony by selfishly hoarding the duplicates in his collection, only letting them pass out of his hands when it ensures the greatest benefit to himself.

As Barnes grows to manhood, he retains both his interest in insect collecting and his covetous nature. Whilst on an excursion, he makes acquaintance with a number of other entomologists, and upon viewing their impressive collections, he is struck by the number of specimens that could only have been obtained from many different parts of the country, including Wales and Scotland. 'He at first concluded that these entomologists must have travelled much', and was surprised when informed that 'neither of them had ever been more than fifty miles from London'. He was intrigued to learn that 'they obtained many things from correspondents whom they had never seen, and whom they had only found out from their communications in the *Zoologist*'.<sup>61</sup> Barnes becomes a regular reader of the *Zoologist*, and writes letters to any entomologists who publish notices of rare captures. His desire for specimens outgrows the capacity of the *Zoologist*, and he is delighted when a new periodical dedicated exclusively to entomology begins, a thinly fictionalised version of the *Intelligencer* entitled the 'Butterfly Collector's Saturday Messenger'.<sup>62</sup> Barnes is thereby able to acquire a large

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<sup>58</sup> *Entomologists Annual* (1856), p. viii.

<sup>59</sup> *Intelligencer*, 2 (1857), p. 129.

<sup>60</sup> *Ibid.*, pp. 137-138; p. 145.

<sup>61</sup> *Ibid.*, pp. 153-154.

<sup>62</sup> *Ibid.*, p. 177.

and impressive collection, the vast majority attained by misleading letters, taking advantage of far better-natured collectors. However, as the entomological community gradually grow wise to his nefarious ways, Barnes is increasingly excluded, as older and wiser entomologists advise more gullible beginners 'not to correspond with Barnes'. He falls into difficulties, is unable to pay his rent, and his collection is seized and sold along with the rest of his goods.<sup>63</sup> This concludes the tale of 'Young Barnes', a stark warning to the readers of the *Intelligencer*.

The story is, of course, an exaggerated and unsubtle parable. However, it draws attention to the impact and implications of periodicals for the practice of specimen exchange. Barnes has no interest in the study of entomology as a science, as his only desire is to possess a large and impressive collection. The specimens are nothing to him except material possessions. In publishing this fiction, Stainton hoped to encourage fair play and good practice amongst his readers. It is notable that Barnes' specimens are poorly preserved, eaten by mites and altogether useless for scientific purposes. He is the very antithesis of the community of careful and selfless entomologists that Stainton was trying to cultivate through his periodicals. Barnes became a byword among the *Intelligencer's* readers for any of their number who were perceived to have acted in a selfish or otherwise questionable way. One Frederick Allgreen wrote to say,

I have been unfortunate enough to 'turn up' a rare moth in some numbers, and have done my best to supply all applicants. Of course Young Barnes victimised me last year, and I bore it as well as I could; but, like Oliver Twist, he wants more, and I have this day received a parcel from him.<sup>64</sup>

Having once been bitten, it seems Allgreen was twice shy. Another reference to the work of Dickens suggests that Barnes had come to inhabit the same imaginative space as Oliver Twist for many of the *Intelligencer's* readers. Browsing through the periodical and Stainton's correspondence, the name of Barnes crops up repeatedly in relation to dubious exchanges.

The story of Barnes can be considered a fable warning of the dangers of ungentlemanly conduct. It was published when the definition of gentility was being debated in nineteenth-century society, with novels of this period by writers such as

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<sup>63</sup> Ibid. pp. 185-186.

<sup>64</sup> *Intelligencer*, 4 (1858), p. 23.

Charles Dickens and William Makepeace Thackeray posing the question of what it meant to be a gentleman at a time of increased social mobility.<sup>65</sup> No longer could inherited wealth or rank be the guaranteed mark of a gentleman, as it had become a matter of character, embodying proscribed codes of morality and correct behaviour. Exactly what or who conformed to these standards remained subject to dispute. The relative anonymity granted by the periodical medium served to heighten this anxiety among its correspondents. Other than a name and address, there was no way to determine the character of a letter-writer until it was too late. In this way, the periodical did not differ greatly from personal correspondence, as Anne Secord has demonstrated that the same problems afflicted the dealings between gentlemen and artisan botanists.<sup>66</sup> However, whereas a degree of control could be exercised by individuals over their personal network, the story of Barnes demonstrates how the periodical increased the difficulty of judging one's correspondents, simply by dramatically increasing the audience for any letter published therein. As will become apparent, it was the language of gentility that was invoked in order to articulate this concern.

The tale of young Barnes poses interesting questions as to how Stainton conceived his audience in the *Intelligencer*, and how he chose to relate to them. The story takes the form of a didactic children's novel, which may be considered odd if it is assumed that the bulk of his readership were adults. Stainton was eager to inspire a love of entomology amongst young men, and there is enough evidence from his correspondence to suggest that the *Intelligencer* enjoyed some popularity amongst boys in their teens.<sup>67</sup> Insect collecting was popular amongst schoolboys like Barnes and his classmates, so it perhaps makes sense that Stainton chose this mode of writing to inspire honesty amongst his younger readers. Although never explicitly stated, the portrait of Barnes' early career is suggestive of a public school (though such institutions were not described as such until the 1860s). There was a strong association between such establishments and the perpetuation of the gentlemanly ideal, with this status conferred upon their pupils by virtue of their education. It is significant that the first *Entomologist's Annual* (1855) contains 'An Address to Young Entomologists at Eton, Harrow, Winchester, Rugby', with the words 'and all other schools' printed considerably smaller than the rest

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<sup>65</sup> Robin Gilmour, *The Idea of the Gentleman in the Victorian Novel* (London: Allen & Unwin, 1981).

<sup>66</sup> A. Secord, 'Corresponding Interests'.

<sup>67</sup> Notable examples are E. Ray Lankester and Thomas Blackburn, both of whom wrote to Stainton regarding the *Intelligencer*.

of this title.<sup>68</sup> Stainton cited the belief of Thomas Arnold, the influential headmaster of Rugby school, that a separation can be observed amongst schoolboys into 'the idlers and the workers of a community'. An active interest in entomology, Stainton contended, will place any young man 'among the latter class'. It provided useful employment for his hours of leisure, and had the added benefit of combining 'the healthful exercise of the sportsman with no small amount of headwork at home'.<sup>69</sup> Again, this relates the practices of natural history with the mid-nineteenth-century preoccupations regarding character and the formation of gentlemanly values.

### **'Gentlemen Entomologists'**

Young Barnes may have been fictional, but the story demonstrates some of the problems and anxieties generated by the periodical. The exchange column of the *Intelligencer* was by far the most contentious aspect, generating a number of noteworthy controversies. It even gave rise to a legal case in 1860, when Peter Bouchard and Henry John Harding appeared before the Court of Queen's Bench at Westminster. Bouchard's occupation is listed in the 1861 census as a 'naturalist and tobacconist', suggesting that he earned his living at least partially through natural history collecting.<sup>70</sup> A number of notices throughout the *Intelligencer* and almost every other natural history periodical of the time reveal him to be a skilled and prolific collector who supplied the cabinets of a great many entomologists - at a price. The nature of the court case confirms this, as Bouchard wished to 'recover damages for the loss which the plaintiff had sustained owing to a communication headed "Caution" which the defendant had published in the *Intelligencer*'. The jury gave a verdict in favour of Bouchard, who received damages of £30. Stainton and Edward Newman were both summoned as witnesses, and requested to bring with them 'a certain manuscript called "The Entomologist's Weekly Intelligencer" number 181 and dated March 17th 1860' and a 'manuscript of an advertisement published at page 197 [...] purporting to be signed by H. J. Harding'.<sup>71</sup> As the editor and printer, Stainton and Newman were also held accountable for this 'great infamy'

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<sup>68</sup> *Entomologist's Annual*, 2nd ed (1855), p. 4.

<sup>69</sup> *Ibid.*, p. 7

<sup>70</sup> *Census Returns of England and Wales, 1861*, 418, folio 147, p. 20.

<sup>71</sup> Stainton's summons to court, 7th May 1860, London, Natural History Museum, H. T. Stainton Correspondence from British Entomologists (MSS STA E 118:118), STAIN T 12:118.

perpetrated against Bouchard, and made settlement out of court through Bouchard's solicitor, A. F. Sheppard, of 38 Moorgate Street in London.<sup>72</sup>

Harding was the President of the Haggerstone Entomological Society, one of the most active and notable of such clubs in London, and his notice claimed he had lent 'various sums of money to Peter Bouchard, of Marling Pit Cottage, Sutton, Surrey, for collecting purposes', of which 'not one penny' had been returned. Harding therefore warned 'all parties against trusting said Peter Bouchard in any way'. The original manuscript contains an addition to this last sentence, which is crossed out: 'as they may expect to get, what I have got - lies and abuse instead of their money'.<sup>73</sup> It is not clear if Harding himself edited the letter in this way, or whether Stainton did so in preparation for printing the advertisement, wishing for a degree of moderation. Before the case went to trial, Stainton published a response from Bouchard in the 'Exchange' column of the *Intelligencer*. Bouchard claimed that in 1845 he had borrowed £3 from Harding, and left in security 'ten cabinet drawers, some of them corked, and containing insects'. Two years later, upon offering to repay the loan in return for the drawers, Harding allegedly refused to part with these items, 'as more drawers had been made and a case, so as to form a nice cabinet'. Bouchard therefore declined to part with his money.<sup>74</sup> If this testimony is to be believed, it seems the original dispute was more financial than strictly entomological, but Bouchard's success in claiming damages suggests that the periodical was capable of both making or breaking the reputation of individuals within the community.

Bouchard's case was exceptional in the degree to which it escalated, but others regularly employed the *Intelligencer* to publicly decry those who they perceived to have wronged them in matters of exchange, as evinced by the following:

Cocking. - A Correspondent writes that he sent a box of insects and a letter, in August, to a gentleman(?) of this name, and has since sent other three or four letters to the same person, but has received no answer and no box. An explanation will oblige.<sup>75</sup>

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<sup>72</sup> A. F. Sheppard to Stainton, 19th June 1860, STAINT 12:118; —, 21st June 1860, STAINT 12:118.

<sup>73</sup> *Intelligencer*, 7 (1859-60), p. 197; H. J. Harding to Stainton, undated, STAINT 12:118.

<sup>74</sup> *Intelligencer*, 7 (1859-60), p. 208.

<sup>75</sup> *Intelligencer*, 5 (1858), p. 36.

The question mark after the word 'gentleman' casts doubt upon the moral character of Mr Cocking, and signifies how the language of class was closely tied to such concerns. When engaging in an exchange with a stranger, it was difficult to judge their social status, or the honesty of their intentions, as the periodical provided little information beyond a name and address. In a later issue, Cocking felt compelled to respond to this slight against his name, claiming that he had received 'upwards of thirty letters from correspondents expressing the greatest satisfaction at the insects they have received from me'. Upon placing his initial offer of exchange in the *Intelligencer*, he had received 'about eighty applications for specimens', including 'boxes and insects, most of which any schoolboy might take with his cap, - and indeed, from their condition, this seems to have been the case'. Given the poor quality and sheer quantity of the boxes received, Cocking was in the process of returning each of them to their original senders, and one correspondent who had previously complained of Cocking's behaviour informed the *Intelligencer* that he was now 'perfectly satisfied', thereby publicly absolving Cocking of any imputation of wrongdoing.<sup>76</sup> The Cocking controversy opened up a wider debate on the subject of exchanges, with two anonymous correspondents bringing into question the process itself.

A gentleman should be above such venal motives as profit. Writing on the history of truth in science, Steven Shapin has demonstrated that gentlemen were traditionally associated with trustworthiness, as their assured social status supposedly gave them no reason to mislead for the purposes of personal gain.<sup>77</sup> This association continued into the nineteenth century, and is evident in the way some men of science sought to self-fashion their identities. Jim Endersby has drawn attention to how certain practitioners were at pains to establish themselves as 'philosophical' naturalists, a label which conveyed a similar notion of reliability and civility. Joseph Hooker, for example, earned his living as a botanist, but nevertheless sought to distance himself from the suspect connotations of being a 'professional'. Instead, Hooker wished to be seen as one who cultivated science for its own sake, and therefore sought to emulate gentlemanly naturalists such as Darwin and Lubbock whose scientific work was untainted by any pecuniary concerns.<sup>78</sup>

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<sup>76</sup> Ibid., pp. 54-55.

<sup>77</sup> Steven Shapin, *A Social History of Truth: Civility and Science in Seventeenth-Century England* (Chicago: University of Chicago Press, 1994).

<sup>78</sup> Endersby, *Imperial Nature*, p. 321

Stainton, as a 'gentleman' of science, could afford to advocate a disinterested approach to specimen exchange, in which seasoned collectors bestowed their duplicates on beginners with no other motive than the promotion of entomology. As J. W. Douglas noted in the preface to the *Substitute*, 'although every one should make whatever return he can for specimens sent, yet the proper spirit is not to expect any return at all [...] We hate the quid pro quo system'.<sup>79</sup> However, the Reverend Joseph Greene disagreed with this sentiment, once again employing similar terms:

I will content myself with remarking, 1st, - That I am always ready to assist (if in my power), without stipulating any return, *bonâ fide beginners*, when gentlemen, i.e. gentlemen in their conduct and dealings. 2ndly, - If I send good insects to collectors of my own standing, I *do* expect a return. 3rdly, - If I find a correspondent trying to get the 'weather-gauge' of me, in self-defence I must make a *bargain*, or decline the honour of his correspondence. I wish this latter class numbered fewer followers. As honourable exceptions I mention, of my own knowledge, Mr Stainton in the 'Micros', and Mr H. Doubleday in the 'Macros'; the liberality (using the word in its most extended sense) shown to me by the latter gentleman, when I was a beginner, I shall not soon forget.<sup>80</sup>

The 'micros and 'macros' referred to are micro and macro Lepidoptera, small and large moths and butterflies respectively, with Stainton specialising in the former and Henry Doubleday in the latter. Greene claims to judge each correspondent on the basis of skill and experience, though his language remains inflected with class-based assumptions. Rather than considering gentility an inherent virtue of wealth or social standing, he explicitly links the status of 'gentleman' to an individual's deportment - their 'conduct and dealings'. Henry Doubleday ran a grocery business with his brother in Epping, yet Greene considered him a true gentleman because of his 'liberality' in gifting specimens. Stainton was praised likewise, regardless of his wealth. Many working-class naturalists of more limited means and opportunities were perhaps less likely to have such a surplus of insects to give away with no expectation of return, though we should be careful of always assuming such an imbalance. The exchange of specimens was fraught with

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<sup>79</sup> *Substitute*, (1856-57), p. 1.

<sup>80</sup> *Ibid.*, pp. 102-103.

'complicated power relations', and Greene's letter indicates the array of factors under consideration by participants.<sup>81</sup>

John Hawley, of Doncaster, 'read with satisfaction' Stainton's words against those who 'call themselves entomologists', yet conducted themselves in a manner 'inconsistent' with 'that generous and gentlemanly spirit in which all scientific pursuits should be carried on'. However, Hawley continued:

I must be distinctly understood to make no allusion to those who openly and honestly make a business of Natural History; with such we deal on recognized principles as honourable tradesmen.<sup>82</sup>

John Riley Hawley (1815-83) was recorded in the 1861 census as a 'painter and decorator', and later became an active member of the Yorkshire Naturalist's Union (formed that same year).<sup>83</sup> His invocation of the 'gentlemanly spirit' is interesting in light of his profession, as it was far from being a trade traditionally associated with gentlemanliness. However, it was not the work through which he earned a living that was required to be gentlemanly, but rather the manner in which he practiced entomology. It was important to him that he did not have any pecuniary interest in the latter, allowing him to conduct exchanges in an honourable fashion. A tradesman was exempt from such considerations, as the relationship was clear, being that of customer and seller. By contrast, Hawley decried that 'genus of collectors' who were 'mere pot-hunters', meaning those who pursued profit at all costs. 'Such is their greedy anxiety to obtain for themselves, and more especially prevent others from obtaining, local or saleable species', these unscrupulous collectors would purposefully exhaust a locality, hunting species to extermination in that particular area.<sup>84</sup>

Hawley's letter sparked a prolonged discussion in the *Intelligencer* regarding the subject of such unprincipled collectors, who were dubbed to be 'amateur dealers', by which it was meant those who sold specimens, but were not those such as Peter Bouchard who made a profession of it. The distinction was important. At this time, a 'professional' naturalist was an individual who earned a living through the collection of

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<sup>81</sup> A. Secord, 'Corresponding Interests', p. 404.

<sup>82</sup> *Intelligencer*, 10 (1861), p. 143.

<sup>83</sup> *Census Returns of England and Wales, 1861, 3518*, folio 62, p. 6; Hawley became the leader of the Entomological Section of the Yorkshire Naturalist's Union, see: *Naturalist*, 5 (1879), pp. 31-32.

<sup>84</sup> *Intelligencer*, 10 (1861), p. 143.

natural history specimens with the express intention to sell. Collecting trips would often be funded by subscriptions, and many dealers had established relationships with wealthy patrons. These collectors were generally considered trustworthy, presumably as dishonest individuals very quickly lost business. The lengths Bouchard pursued to clear his name of any misdemeanour is testament to the importance that was placed upon reliability by these 'professionals'. By contrast, so-called 'amateur' dealers appear to have been opportunists who often resorted to underhand methods in order to attain the highest prices for their insects. Exactly why such men were considered 'amateurs' was never explicitly explained by any of the correspondents who adopted the term, though it is possible this was a simple way to distinguish them from the more reputable professional dealers. As demonstrated by the ensuing debate, the distinction was not necessarily clear-cut, and usefully illustrates the ways in which the community of the *Intelligencer* sought to define itself.

As usual, Stainton published varying opinions on this subject in a fairly even-handed manner, giving a representative view of a cross-section of the periodical community. The next letter published on the subject came from C. S. Gregson, who claimed that amateur dealing had become common among both 'clerical and lay dealers', often making it 'next to impossible to obtain a species, once it gets into their hands, without submitting to their terms of exchange'. However, in the same letter, he chose to single out a particular individual as a perpetrator of this nefarious practice, accusing Edwin Birchall of employing a small army of children to collect specimens. Gregson visited a locality, shared by Birchall in the *Zoologist*, and discovered 'more than thirty' children collecting *Nyissia zonaria* 'at one penny per dozen for males'. He was approached by 'one young urchin' who offered to sell Gregson thirty-five dozen, held in a pickle bottle, if he gave 'th' same price as th' mon e' specteckells tow'd 'em he'd give for o' they cud fend'.<sup>85</sup> This was improper for a number of reasons, as it meant that certain localities were stripped of all insects, leaving none for other collectors. Secondly, and perhaps even worse, his supposed aim in employing this sweat-shop style labour was in order to furnish him with an abundance of specimens that could then be sold for a profit.

Charles Stuart Gregson (1817-99) was an infamously cantankerous Lancashire entomologist who began life as a ship painter in Liverpool, but went on to become a plumber and glazier. By 1861, his occupation is listed vaguely as a 'proprietor of

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<sup>85</sup> Ibid., p. 151.

houses', suggesting he derived his income from renting out property. He became pre-eminent among the collectors of the northern counties, and according to one obituary:

It was the keen rivalry between the observant field-naturalists that Lancashire produced in the 'fifties' and those belonging to our Southern counties, of whom Stainton was the acknowledged leader, that brought about such rapid extension of our knowledge at that period, and resulted in an accumulation of material that has never since been equalled.<sup>86</sup>

Gregson was eccentric, even by the standards of nineteenth-century naturalists, keeping a tame African eagle that served as watchdog for his home, and was 'accustomed to relate how, on one occasion, being out after rabbits and without a net, he *shot* a *Colias edusa* [clouded yellow butterfly]'. He was notoriously tight-lipped when it came to advertising where he had captured his specimens, and the *Entomologist's Monthly Magazine* recalled upon his death in 1899, that he 'had in him all the requirements for a scientific entomologist, but perverted by educational deficiencies in the first instance, combined with an excess of egotism'.<sup>87</sup> This suggests that it was a flaw in Gregson's character, rather than his skill and knowledge as a practitioner, that was a major impediment to him becoming a 'scientific' entomologist. The next chapter will look in more detail at the *Entomologist's Monthly Magazine*, and will make clear why such a claim is significant.

The man accused of wrongdoing by Gregson, Edwin Birchall (c.1819-84), was another northerner (at least by birth), the son of a wealthy Leeds businessmen. 'A born naturalist, an enthusiastic collector, and of an extremely genial and buoyant disposition', he also 'enjoyed a controversy in print' and 'was a constant contributor on Entomological subjects to the various periodicals'. In 1861, his occupation was recorded as a 'carrier's agent' (managing the shipment of goods), but by 1881 he had left this behind to become 'a scientific writer (author) principally on natural history'. The pursuit of insects would ultimately cost Birchall his health, as he never fully recovered from falling down a cliff whilst out collecting.<sup>88</sup> He and Gregson had clashed in the pages of the *Intelligencer* earlier in 1861, with Birchall questioning Gregson's claim (allegedly

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<sup>86</sup> *Entomologist's Record and Journal of Variation*, 11 (1899), p. 81; *Census Returns of England and Wales, 1851*, 2192, folio 668, p. 32; *Census Returns of England and Wales, 1861*, 2736, folio 24, p. 42.

<sup>87</sup> *E. M. M.*, 35 (1899), p. 97.

<sup>88</sup> *E. M. M.*, 21 (1884-85), p. 23; *Census Returns of England and Wales, 1861*, 2643, folio 39, p. 1; *Census Returns of England and Wales, 1881*, 5605, folio 53, p. 15.

made in a paper read before the Historic Society of Lancashire and reported by the *Liverpool Mercury*) regarding a certain species 'captured on the coast of Cumberland'. Gregson's reply spanned over four pages of a subsequent issue, accusing Birchall of stealing his 'good name', and heavily implied that Birchall was 'pseudo-scientific'.<sup>89</sup> The vehemence of Gregson's reply demonstrates the importance placed upon maintaining one's reputation within the pages of a periodical such as the *Intelligencer*, in much the same way as James Batty's unpublished rebuttal in the previous chapter. Any suggestion that your statements lacked veracity had to be immediately quelled, lest you risk all your future epistles being considered as suspect. Cast in this light, the subsequent dispute between Gregson and Birchall was as much a case of personal enmity as a strictly scientific issue, but nevertheless the terms in which they sought to attack each other are of significance.

Another correspondent, Charles G. Barrett (1836-1904), weighed in on the issue of 'amateur dealers'.

With regard to exchange or 'selling', as Mr Gregson calls it, he appears to be strangely ignorant of the fact that such a thing is hardly recognised among gentlemen entomologists. As far as my knowledge extends, the rule is to give away duplicates, without regard to the return that might be made - always reserving the right to refuse specimens to those who do not observe the same liberal principle. In this way every one does the best he can for his friends.<sup>90</sup>

Barrett, aged around 25 when he wrote this, was a civil servant who would later form part of the editorial team for the *Entomologist's Monthly Magazine*, and the author of the important *Lepidoptera of the British Islands* (1893-1907). The son of an Inland Revenue officer, he originally trained as an engineer at an ironworks before following in his father's bureaucratic footsteps, eventually attaining 'nearly the highest rank in his Department'. His obituary stands in direct contrast with the faint praise that damned Gregson, with Barrett lauded for his 'candour and generosity', a 'genial, energetic and hearty manner', and 'unstinted liberality in supplying our collections with rare and interesting species'.<sup>91</sup> In the pages of the *Intelligencer*, Barrett personally vouched for

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<sup>89</sup> *Intelligencer*, 10 (1861), pp. 109-110, 133-136.

<sup>90</sup> *Ibid.*, p. 159.

<sup>91</sup> *E. M. M.*, 41 (1905), pp. 25-27.

the character of Birchall, his friend, against Gregson's accusations. Likewise, the Reverend Francis Orpen Morris (1810-93), also added his voice to the testimony of Barrett, claiming of Birchall 'I have never known a gentleman of a more generous and liberal spirit in all matters entomological'.<sup>92</sup> Although the periodical went some way towards disrupting the traditional model of 'gentlemanly science', in which the exchange of information and specimens was confined within a carefully managed network of personal correspondence, it seems this was transposed into print to some extent. Barrett's wish that he could do 'the best he can for his friends' smacks of cliquishness. Furthermore, his assertion that Gregson was ignorant of the conduct of 'gentleman entomologists' can be seen as a pointed remark against the Lancashire collector's conduct in calling Birchall into question, a distinctly ungentlemanly course of action. Gregson's pugnacious manner, combined with his working-class background, could not have endeared him to many.

### **'Ten Shillings a Specimen'**

The increasingly contentious nature of such debates in the *Intelligencer* may have been the result of its rapid publication. The same point has been made by Melinda Baldwin regarding *Nature*, which was also issued weekly. While a monthly or quarterly gave correspondents time to choose their words more carefully, or allowed the heat of the moment to pass, a periodical published every week demanded an equally quick response from its readers.<sup>93</sup> When this combined with personal rivalries and conflicting egos, as in the *Intelligencer*, the result was a considerable degree of rancour.

In further disputes regarding exchanges, the terms 'gentleman' and 'gentlemanly' were regularly invoked. A correspondent who identified himself as 'No Pothunter' railed against the practices of 'Amateur Dealers', who hunted specimens for the sole aim of turning a profit:

Another insect which is unique in my cabinet for many years (it was figured in Curtis's work) has been taken, by a gentleman, in some abundance, but it is not to be obtained from him by the usual gentlemanly practice of exchange, but by purchase at ten shillings a specimen.

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<sup>92</sup> *Intelligencer*, 10 (1861), p. 181.

<sup>93</sup> Melinda Baldwin, *Making Nature: The History of a Scientific Journal* (Chicago: University of Chicago Press, 2015), p. 64.

Let dealers get as much as they possibly can, but I think it *infra dig* [beneath one's dignity] for gentlemen to follow their example.<sup>94</sup>

Once again, the distinction was drawn between professional dealers - tradesmen who were therefore exempt from the implications of ungentlemanly behaviour - and 'amateurs' who attempted to fleece their fellow collectors. However, this correspondent apparently had no problem with exchange *per se*, nor did he consider it to be unbecoming of a gentleman. The next respondent upon this issue was Hawley, the initial instigator of the discussion, who responded to Barrett's message thus:

I hope that Mr Barrett does not wish to insinuate that only those who abstain from what Mr Gregson called 'selling' their specimens are 'gentlemen'; because, if so, judging from the notices under the head of 'Exchange' in the *Intelligencer*, the 'gentlemen entomologists' are in a most lamentable minority.<sup>95</sup>

The dialogue continued, though increasingly it seems to have become a case of friends stepping in to defend each other. George Gascoyne, a merchant's clerk from Newark in Nottinghamshire, described Hawley as an 'old friend and collecting companion through many a sunny day and dewy night'. His opinion was as follows:

Much has been said about exchange; it appears to me to be of two kinds, but which have been confounded by some correspondents. If a friend writes to me for insects which he knows I possess in duplicate, and requests I will in return mention some that would be acceptable to me, that he may not have to send back my box empty, I hold that we make gentlemanly exchange. On the other hand, mere collectors and dealers pursue the practice now carried on through the pages of the *Intelligencer*, and which is best conveyed by the term barter, a word not found in the vocabulary of the naturalist.<sup>96</sup>

Gascoyne identified the impersonal nature of the periodical as at the root of the problem, seemingly suggesting that 'gentlemanly exchange' was only possible between those who are already acquainted.

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<sup>94</sup> *Intelligencer*, 10 (1861), p. 168.

<sup>95</sup> *Ibid.*, p. 175.

<sup>96</sup> *Ibid.*, p. 190; *Census Returns of England and Wales, 1861, 2480, folio 34, p. 20.*

This cut against the spirit in which the *Intelligencer* was established, and such a course of action would have effectively precluded a great number of its readers from participating in this practice. Gascoyne's admission that he and Hawley knew each other again suggests that the community continued to function along the lines of personal acquaintance, rather than entirely between strangers, which is unsurprising. Not all of the correspondents agreed with this definition of 'gentlemanly exchange', as there were many who had greatly benefitted from the new system instigated by the *Intelligencer*. William Thomas, the Sheffield furnace builder seen clashing with James Batty in the previous chapter, offered his opinion on exchange:

I see a Dublin correspondent [Barrett] does not consider it gentlemanly to exchange: I think it quite as gentlemanly and as honest to ask outspokenly in your columns as it is to ask for them otherwise. Perhaps gentlemen can afford to go to their different localities and take them; I, as a working man, cannot afford to do so, and if I wait until gentlemen send them to me I fear I shall see blank places in my drawers for a long time yet. In conclusion, I may say I cannot afford to buy (I would not if I could), I will not sell, and I think I have as great a desire to possess species I have not got as any gentleman that I know of.<sup>97</sup>

Thomas' remarks encapsulate both the opportunities and dilemmas faced by many working-class naturalists who wished to expand their collection, but lacked the means with which to do so beyond the confines of their immediate neighbourhood. The repeated emphasis on the word 'gentleman' and his self-identification as a 'working man' are not deferential in this case. Thomas asserted his right to attain the desiderata of his private collection as equal to that of any 'gentleman' who might have considered it beneath them to engage in exchange through the *Intelligencer*.

Amidst all this discussion of gentlemanly behaviour, it is remarkable that none of the disputants described above can be considered to conform to the traditional idea of a gentleman in nineteenth-century society. Even Barrett's position as a civil servant was not a *de facto* guarantor of this status, particularly considering his 'ungentlemanly' past as an engineering apprentice. Gregson, the fractious plumber, disqualified himself both by his employment and conduct. However, the occupations of these letter writers would

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<sup>97</sup> *Intelligencer*, 10 (1861), p. 172.

not have been apparent to the readers of the *Intelligencer*. The insistence on gentlemanly behaviour, therefore, can be seen as a way of self-fashioning, with correspondents seeking to represent themselves through the periodical as adhering to the same high ideals and moral rectitude considered to be the hallmark of a true gentlemen, even if they lacked the societal status associated with that lofty attainment. It is significant that this debate took place in 1861, at a time when the nineteenth-century politics of character had reached a height. Over thirty years after the First Reform Act of 1832, the question of electoral reform was once again mooted, leading to the Second Reform Act of 1867. In much the same way that the correspondents of the *Intelligencer* discussed who should be considered part of the scientific community (or not), politicians and those who held the vote argued over who could be permitted to participate in the nation's democratic process. The language employed in both cases hinged largely on the subject of moral character, and the potentially questionable motives of those who wished to engage in science or politics. As Stefan Collini notes, 'it is an indication of the hold of the language of character that so much discussion in 1867 was not about the respectable workman's rights but about his habits'.<sup>98</sup> Could such men be trusted not to use the vote in a selfish way, looking rather to the greater good of the community? Likewise, the mercenary habits of so-called 'amateur dealers' were very much the antithesis of the selfless ideal envisioned by those who wished to build a scientific community based on trust and generosity of spirit.

### **'Infinite Bartering'**

Further evils of the trading system are illustrated by a notice in the *Substitute*, which claims that a lot of 'foreign *Phlogophora empyrea* have been imported into Brighton for distribution as British specimens'. This was followed by a warning that any individuals caught in such an act would be named and shamed in the periodical.<sup>99</sup> An anonymous letter writer, identified only as 'M.T.', begged the editor to do anything within his power to 'reduce this unscientific system of exchange, which can do nothing to advance Science'.

How can a person expect to learn anything of insects by merely receiving them per post? If I see a good insect in my friend's cabinet, and, thinking to

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<sup>98</sup> Stefan Collini, *Public Moralists: Political Thought and Intellectual Life in Britain, 1850-1930* (Oxford: Clarendon Press, 1991), p. 112.

<sup>99</sup> *Substitute* (1856-57), p. 2.

gain some information as to the locality whence it was taken, I ask him the oft-repeated question, 'Where did you take that?' I learn little by his replying, 'From a box sent to me by a correspondent'.<sup>100</sup>

According to M.T., the process of exchange rendered a specimen scientifically worthless, reducing it to a commodity to be traded. Divorcing it from the localised knowledge that provided it with context, it no longer served any purpose other than filling in the gaps of a collector's cabinet. Another correspondent, 'Anti-Barter', whilst acknowledging Stainton's undoubted contributions to the field of entomology, felt that he had 'at the same time lowered it as a Science by being the unintentional cause of infinite bartering'.<sup>101</sup> A further letter published in the same issue proposed a solution to this, suggesting that entomology should emulate botany by establishing an 'Exchange Club' to mediate these interactions.<sup>102</sup> This sentiment was echoed by a correspondent in the next issue, who signed himself as 'A Lover of Honesty in Science'.<sup>103</sup>

The concerns over the provenance of certain specimens was more than just a question of avoiding unscrupulous dealers, but as much a matter of scientific veracity and integrity. In 1857, almost a year after the inception of the *Intelligencer*, two leading members of the entomological community, the Reverend Joseph Greene and Charles Robert Bree, felt the need to intervene through the *Zoologist*. The timing is significant, as both their letters refer to the *Substitute* (the *Intelligencer* having paused for the winter), signifying that it was the advent of the weekly periodicals that had precipitated this crisis regarding the corrupt practices of certain collectors and their nefarious methods of exchange. Greene and Bree were regular contributors to both the *Zoologist* and the *Intelligencer*, so it is significant that they made a conscious decision to go with Edward Newman's publication rather than Stainton's. Perhaps they felt that more sympathy would be gained from the established community of the *Zoologist*, rather than the *Intelligencer*'s newly formed readership, many of whom would quite probably resent such an attack on the practice of exchange. Greene (1824-1906) was a parish priest, at the time based in Playford, Ipswich. He had recently published his influential paper 'On Pupa Digging' (again, in the *Zoologist*), regarding this particular collecting practice which he mastered and popularised, and upon his death his name was considered 'a

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<sup>100</sup> *Intelligencer*, 5 (1858), pp. 71-72.

<sup>101</sup> *Intelligencer*, 9 (1860), p. 85.

<sup>102</sup> *Ibid.*, pp. 86-87.

<sup>103</sup> *Ibid.*, pp. 79-80.

household word' among lepidopterists.<sup>104</sup> For Greene, it was not simply a question of personal morals that were at risk from deceitful collectors. Rather, it was the science of entomology itself that was at stake.

It is a very sad thing to know that there are men who will prostitute the honour and dignity of Science, and degrade the very name of Entomology, by having recourse to dishonest conduct. Talking to a valued friend last year, in my garden, I was almost horrified by being told that such is the low moral standing among entomologists that, were a new insect to be discovered, there are vast numbers of collectors who would at once doubt the genuineness of the discovery!

Periodicals such as the *Intelligencer* and the *Zoologist* could only function effectively if their readers could trust what was printed therein. The system of exchange was degrading this, and Greene imagined with horror 'the possibility of some vulgar brute getting up in some Society's meetings, and doubting the genuineness of the [...] last discovery!'.<sup>105</sup>

C. R. Bree (1811-86), as he invariably signed his correspondence to periodicals, was a physician living in Stowmarket (not a great distance from Greene in Ipswich). His most notable legacy is a book with the self-explanatory title, *An Exposition of Fallacies in the Hypothesis of Mr Darwin* (1872).<sup>106</sup> He suggested that 'the Science would get on a great deal better' without 'mere collectors', who (he added) 'might find consolation in taking to pigeons or postage-stamps instead'. He insisted on a radical remedy to the systemic problem of dishonest dealers:

If we cannot have a republic, let us have an oligarchy. Let the tempter and the tempted - the men with great means, who corrupt the men with small ones, and the men with small means and no honesty - be equally avoided. Let them be tabooed as men who degrade Science into the lowest form of barter. The greatest half of the dishonesty which is staining the fair name of

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<sup>104</sup> *E. M. M.*, 42 (1906), p. 66-67.

<sup>105</sup> *Zoologist*, 15 (1857), p. 5535.

<sup>106</sup> C. R. Bree, *An Exposition of Fallacies in the Hypothesis of Mr Darwin* (London: Longmans, Green, & Co., 1872).

this country exists in men who wear good coats and condone the rascality which is corroding the best principles of the world around us.<sup>107</sup>

The dubious origin of many so-called 'British' specimens in collections remained an issue, as Edwin Birchall himself would draw attention to in 1877. Writing in the *Entomologist's Monthly Magazine* about a recent trip to London, during which he had viewed a number of private collections of Lepidoptera, Birchall was surprised at the great number of certain species that he considered only to be British by 'tradition or chance immigration than as truly native'. At first he attributed this to some failing on his part as a collector, however, 'I saw that to many of these rarities written histories were attached, that it was deemed needful as it were to apologise for their possession', and only in 'very, very few cases' could the owner claim to have caught the insect themselves. Birchall lamented:

Besides examining the condition of the specimen, enquiry seemed needful into the moral character of the seller and each previous holder of the insect, making the formation of a British collection an occupation more suited to a police officer than a naturalist.<sup>108</sup>

It seems that dishonesty was an inherent problem in entomology throughout the nineteenth century and, just as the periodical facilitated the exchange of specimens, it correspondingly increased the opportunities for unscrupulous individuals to take advantage of their peers' desire for a complete collection.

## Conclusion

A periodical contemporary to the *Intelligencer*, the *Naturalist* (1851-58, one of several to go by this name during the nineteenth century), published a short book review in 1857. The volume under consideration was not a work of natural history, but rather a guide to etiquette, entitled *Blunders in Behaviour* (second edition, 1857). William Orpen Morris, editor of the *Naturalist*, observed:

A naturalist it must be taken for granted, is, and must be, at all events one of 'Nature's gentlemen'. It is not therefore for me, as their guide in the fashions of nature, to suppose but that every one of my good readers is perfect in

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<sup>107</sup> *Zoologist*, 15 (1857), p. 5536.

<sup>108</sup> *E. M. M.*, 13 (1876-77), p. 279.

politeness [...]. Nevertheless, perhaps some of their acquaintance, if themselves do not, may require as few 'Hints on Etiquette', [...] and for their behoof I bring under their notice the work whose title is prefixed.<sup>109</sup>

There is very little disguising the heavy-handed hint that Morris wished to drop here. The book he reviewed was one among many similar titles produced in this period, catering for a growing audience of readers who were eager to ensure their behaviour was consistent with that expected by 'genteel' society. As one of 'Nature's gentlemen', a naturalist was held to such standards, but Morris' review clearly indicates a problem that was endemic among those who pursued natural history. The *Naturalist* described itself as a 'popular' magazine, suggesting that it attempted to reach a broad community of collectors drawn from various social backgrounds. This perhaps explains why it encountered the same issues faced by the *Intelligencer*, and its editor felt it necessary to intervene.

Studying the practices of collecting and exchange among entomologists gives us a number of significant insights. Any community, scientific communities included, must have shared values (even if there is ongoing debate as to just what those values are). Collecting and specimen exchange was the common currency between individuals engaged in natural history, and therefore we must pay close attention to the ways in which these practices functioned in the construction of identities and communities. The periodical served as a space through which the standards of collecting were described, debated, and disseminated. Furthermore, the practice of exchange through the medium of the periodical gave individuals an opportunity to actively participate in the circulation of knowledge, providing they were able to master the skills and etiquette required. The mid-nineteenth-century preoccupation with character proved to be a way in which many chose to identify themselves and others within and without these communities, as this carried with it gentlemanly associations of disinterestedness, and therefore of trustworthiness. The very process of creating a community through a periodical necessitated a discussion about how that community should be defined. This is not to say that these issues were unique to periodicals, as similar negotiations of class were carried out through private correspondence. However, the periodical brought such problems into sharper focus by engendering a greater sense of a community than was possible through letter writing. As demonstrated in the previous chapter, the

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<sup>109</sup> *Naturalist*, 7 (1857), p. 92.

*Intelligencer* brought together a far greater number and range of individuals than any other previous entomological community, and thereby allowed for the articulation of a collective identity.

The example of the *Intelligencer* thereby complicates notions of 'high' and 'low' science, as the very lack of a stable, discernible boundary is what engendered the debates that are evident within the periodical. Practitioners felt the need to find other ways of differentiating who was within and without the limits of acceptable practice, and these discussions reflected concerns apparent in society more broadly. Doing entomology, and being an entomologist, required more than identifying a butterfly or capturing a moth, but also mastering the form in which this information should be communicated. As the next chapter will discuss, the distinction between 'mere collectors' and scientific entomologists became increasingly significant from the 1860s onwards.

## CHAPTER THREE

### Classifying

Loyal readers of the *Entomologist's Weekly Intelligencer* received an unpleasant shock on Saturday 24th August, 1861. All appeared to be normal as they picked up their copy of the periodical's latest issue, but upon reading through the customary editorial, it became quickly apparent that something was amiss. Henry Tibbats Stainton, having 'duly considered the subject in all its bearings', announced that he would discontinue the *Intelligencer* after the close of the present volume. The reason he gave for this was 'the increasing evil of periodicals'.

Their number is continually increasing, and that alone is a great evil; but a periodical viewed scientifically, is at any rate an evil: it is an evil *because* it is a periodical.

This seems to be a drastic change of heart from a man who had devoted so much time and energy to producing such publications, but Stainton claimed 'some means ought to be devised of decreasing the number of existing periodicals', as 'there are too many of them'. He argued that filling the pages of these journals necessitated many contributors to 'write not that they have anything to say, but because *something* is wanted to be written'. Conscientious readers must therefore devour 'much chaff with their corn, and the chaff must frequently be taken into the mouth and well chewed before the discovery is made that it is really *not* corn'.<sup>1</sup>

Stainton's reasons for bringing the *Intelligencer* to an end are no doubt more complex than the explanation he offered his readers. It is likely that the strain of almost single-handedly editing and assembling a periodical on a weekly basis - for the past five years - was not sustainable for a man who did not enjoy the most robust health. Disenchantment with the entomological community seems also to have played a part, as his once playful editorials become increasingly ill-tempered or lugubrious in tone. Furthermore, in answer to the outpouring of regret from numerous correspondents at the demise of the periodical, Stainton stated that 'entomology in England is passing through a phase of depression' in reaction to the 'unnaturally buoyant' years when the *Intelligencer* first began. The number of practitioners was decreasing, which Stainton

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<sup>1</sup> *Entomologist's Weekly Intelligencer*, 10 (1861), pp. 161-162.

believed was a consequence of the growing 'volunteer movement', a newly established force of part-time soldiers and forerunner of the present-day British Territorial Army. The Crimean War had exposed the shortcomings in the British military's manpower, with the Regular Army stretched thinly across the Empire, leaving Britain itself vulnerable to invasion. This was a prospect that seemed far from remote, as tensions with France were once again running high at this time. In response, the Volunteer Force was formed in 1859, and according to Stainton, this diverted the attention of many men who might otherwise have spent their spare time collecting and studying insects. To make matters worse, those who chose to ignore the call to arms in favour of entomological pursuits were apparently 'suffering from listlessness and languor'. As a result, 'the bulk of the readers of the *Intelligencer* were apathetic as to its continuance, and hence it ceases to appear'.<sup>2</sup>

Almost thirty years after the *Intelligencer's* last issue, in 1890, and a few years before Stainton himself died at the age of 70, another periodical commenced entitled the *Entomologist's Record and Journal of Variation*. It was established and edited by a schoolmaster, James William Tutt (1858-1911), born a few years after the inception of the *Intelligencer*, and only around three years old when it ceased. He was therefore of a very different generation to Stainton, growing up in a world in which the study of natural history was undergoing transformation, and the *Entomologist's Record* reflects many of the changes that had occurred in the intervening thirty years. Most obviously, post-1859, is the advent of Darwin's *Origin of Species* and the theory of natural selection. While this was largely ignored by the *Intelligencer*, and the scant notice it received was not favourable, the *Record's* self-declared purpose as a *Journal of Variation* signified a considerable shift in opinion. Furthermore, a number of other significant differences are apparent, and periodicals serve as an excellent lens through which to examine these changes, as it was through such publications that they were debated and represented. While the previous two chapters have taken a more fine-grained approach to a specific periodical within a short timeframe, this chapter will take a broader view by considering these thirty years subsequent to the *Intelligencer's* demise through a study of its successors. As before, a key practice of natural history - that of classification - will act as a point of comparison between these publications. As will become apparent, much of the discussion is less concerned with how classification was

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<sup>2</sup> Ibid., pp. 185-186.

carried out, but rather the question of who actually engaged in the practice of classification (and who did not), and how this defined them as an entomologist (or not).

### **Amateurs and Professionals**

Before proceeding further, it is necessary to refer briefly to the historiography of professionalisation in the British life sciences, as this chapter touches upon a number of vexed issues within established scholarship. A dominant narrative in accounts of the nineteenth century's latter half is the rise to prominence of biology, which is often juxtaposed with the more antiquated mode of natural history. Championed by the bullish T. H. Huxley, the biological approach to the study of living forms is often associated with an attendant shift towards professionalisation and a focus on the laboratory rather than the field as the primary site of scientific practice. Through a study of the periodicals that followed the demise of the *Intelligencer*, this chapter will interrogate this narrative and offer a more nuanced account. As demonstrated by the previous two chapters, 'amateur' was a term used infrequently by contributors to the *Intelligencer*, and not in a sense that contrasted with professional practitioners. In this context, a 'professional' naturalist was someone who collected specimens in order to sell them, rather than a salaried expert or researcher. This began to change in the thirty years subsequent to the *Intelligencer*'s final issue, with a growth in the number of men (and even a few women) who held paid positions as practitioners of science. However, many leading figures were still very much non-professional, pursuing natural history independent of any such pecuniary considerations. It would therefore be misleading to suggest that the life sciences underwent a comprehensive professionalisation in this period. Furthermore, professionalisation should not be considered as an overarching narrative, but rather as a set of strategies adopted by particular groups of practitioners in an attempt to consolidate their scientific authority.<sup>3</sup>

As practitioners sought new ways of fashioning their identities from the 1860s onwards, we see the terms 'professional' and 'amateur' being used more frequently to distinguish between individuals who held paid positions as men of science and those who did not. That notwithstanding, using the word 'amateur' as a blanket term by which to refer to these individuals can be misleading, as it belies a whole range of distinctions that were of greater importance to the actors themselves. It would elide the huge gulf in

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<sup>3</sup> Samuel Alberti, 'Amateurs and Professionals in One County: Biology and Natural History in Late Victorian Yorkshire', *Journal of the History of Biology*, 34 (2001), 115-147.

experience between Stainton, a man of independent means, and the Sheffield razor grinder James Batty, who collected moths in the time he could spare from the more pressing need to earn a living. Furthermore, while Stainton's wealth may have afforded him a great number of social advantages, he was the son of a fraudulent businessmen, not a member of the respectable minor gentry like Charles Darwin. The division may seem like a trifling one in retrospect, but as the traditional boundaries of mid-nineteenth-century society broke down, such gradations could take on greater significance. A number of studies regarding the status of the 'man of science' during the nineteenth century have made it increasingly apparent that there are a host of other factors that must be considered alongside that of the amateur-professional dichotomy.<sup>4</sup>

J. F. M. Clarke has charted the emergence of professional entomology in the nineteenth and early twentieth century, driven by the demands of empire and thereby necessitating a cadre of paid experts who sought to understand the insects that posed a serious threat to crops or the human body.<sup>5</sup> Whilst admitting there is much truth in this, Jim Endersby has critiqued Clarke's account for its teleology, as it seems to take a 'tacit assumption that the eventual shape of scientific careers was a goal consciously pursued by the men of science'.<sup>6</sup> What this chapter will argue is that the leading practitioners of entomology during the second half of the nineteenth century - Stainton among them - were more concerned with establishing their research as thoroughly scientific, distancing themselves from the 'mere collectors' who read the *Intelligencer*. This was done through the medium of a new periodical, the *Entomologist's Monthly Magazine*, which was established to replace Stainton's previous periodical, and intended to create a very different kind of scientific community. This was not an attempt to professionalise, as none of these individuals were professional entomologists, nor were they outspoken advocates of establishing such positions.

Whilst remaining wary of the unproblematic use of 'amateur' to denote any non-professional naturalist of this period, it is nevertheless useful to compare the strategies employed by these entomologists to the rhetoric of 'amatuerisation' outlined by Samuel

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<sup>4</sup> Jim Endersby, *Imperial Nature: Joseph Hooker and the Practices of Victorian Science* (Chicago: University of Chicago Press, 2008); Paul White, *Thomas Huxley: Making the 'Man of Science'* (Cambridge: Cambridge University Press, 2003); Ruth Barton, 'Men of Science': Language, Identity, and Professionalization in the Mid-Victorian Scientific Community', *History of Science*, 41 (2003), 73-119.

<sup>5</sup> J. F. M. Clarke, *Bugs and the Victorians* (New Haven: Yale University Press, 2009), pp. 187-215.

<sup>6</sup> Jim Endersby, Review of *Bugs and the Victorians* by J. F. M. Clarke, *Reviews in History* (2010), <http://www.history.ac.uk/reviews/review/924> [accessed 26 May 2017].

Alberti in his study of the life sciences in late nineteenth-century Yorkshire. Alberti himself acknowledges the 'variety of amateur practices', with definitions being 'culturally and locally contingent'. He contends that just as laboratory-based biologists sought to establish a professional community, many 'amateurs' attempted to refashion their role in the production of scientific knowledge through a rhetoric of 'amateurisation'.<sup>7</sup> This is characterised as a conscious attempt by a select number of non-professional naturalists to distance themselves, and the communities in which they operated, from the more recreational aspects of natural history, instead emphasising their scientific credentials in an attempt to assert authority as field-based researchers. These individuals would mostly not have described themselves as amateurs, of course, but nevertheless, a large part of their identity as men of science was informed (and contingent upon) their lack of professional or institutional status.

### **Classifying Entomologists**

John Obadiah Westwood (1805-93), who would go on to become the first Hope Professor of Zoology (essentially entomology) at Oxford in 1860, wrote that 'entomologists, like the objects of their research, may be classified'.

First, there is the amateur, whose sole object is the procuring, either by capture or by purchase, of a collection of handsome insects, to be placed in drawers without any arrangement than that of beauty and colour or size, or in glazed picture-frames to be hung in his room.

The above was written in 1838, with the term 'amateur' used to denote a dilettante or hobbyist, who dabbles in 'entomology' without any pretensions towards science. Westwood considered such individuals to be the 'lowest class of entomologists', a phrase indicating that his 'classification' was informed by social as much as scientific considerations. These 'amateurs' he contrasts with 'the systematic entomologist, who is not content with merely collecting insects, but who is intent in classing his collections, arranging each in its proper place and under its proper name'.<sup>8</sup> This division is, of course, an over-simplification, but it does nod towards the broad spectrum of motives and activities that fall under the loose definition of natural history during the nineteenth century, and persist to this day. Classification - that is defining, naming, and grouping

<sup>7</sup> Alberti, 'Amateurs and Professionals', pp. 132-136.

<sup>8</sup> John Obadiah Westwood, *Entomologist's Text Book; An Introduction to the Natural History, Structure, Physiology, and Classification of Insects* (London: William Orr and Co., 1838), pp. 28, 31-32.

biological organisms according to shared characteristics - was the primary mode of scientific entomology during the nineteenth century. This is not to say that other aspects of insect-life were entirely neglected, as attention was also paid to the insects' habits, life-cycle, and physiology, but the majority of published research and papers given before societies were concerned with describing newly discovered species, or redefining known species.

This process of classification was based upon the examination of specimens - that is, dead and pinned insects - rather than from the living creature, just as botanists employed the herbarium sheet to achieve the same end. Writing on the progress of entomology in 1901, J. W. Tutt asserted 'there can be no doubt, whatever, that the progress of systematic work will be the feature by which the nineteenth century will be specially known'. By this, Tutt meant the 'easy determination of known, and the detection of unknown species'. By way of demonstration, he noted that 'in 1758, the known number of Lepidoptera in the world was 585', by the end of the eighteenth century this figure had reached 2,400, while 'at the present time the number of described Lepidoptera can be little short of 80,000'. It is interesting that Tutt considered Stainton's *Manual* to be the last and most complete catalogue of British Lepidoptera, and pointed to the *Natural History of the Tineina* as pioneering 'biological work' due to its emphasis on observing and elucidating the life histories of living insects rather than describing from inert specimens.<sup>9</sup> That notwithstanding, the overwhelming focus on classification during this period is best demonstrated by John Lubbock's observation, made in the *Entomologist's Annual* for 1856, that 'in the last four volumes of the *Transactions of Entomological Society [of London]*, 818 pages are devoted solely to descriptions of species and genera', while only 244 pages were given over to other aspects of the science such as 'the habits of insects'.<sup>10</sup>

Jim Endersby has described classification as 'the basic tool of Victorian natural history', as it was 'the key to providing stable names that facilitated scientific communication'. Furthermore, the 'act of conferring (or refusing to confer) a name is, in effect, a pronouncement on one of the most fundamental questions in biology: what, if anything, is a species?'.<sup>11</sup> However, many entomologists of this period were able to

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<sup>9</sup> *Entomologist's Record and Journal of Variation*, 13 (1901), pp. 1-2.

<sup>10</sup> *Entomologist's Annual* (1856), p. 116.

<sup>11</sup> Endersby, *Imperial Nature*, p. 138.

continue their work of classification without any great engagement with perhaps the greatest species-related question, that of evolution and the origin of species. For them, such lofty questions were considered beyond the purview of the working naturalist, whose role was to steadily accumulate facts without indulging in theoretical speculation.

The most basic unit in the hierarchy of classification is the species, with these in turn then grouped into genera, families, orders, classes, phyla, kingdoms and domains. For example, insects are a class and Lepidoptera are an order. There are currently 125 families of Lepidoptera, which are further split into genera and further into thousands of species.<sup>12</sup> To further complicate matters, there is inevitable variation within a species, and it remains a matter of much discussion as to how broadly or narrowly species and varieties can be construed. Nineteenth-century taxonomists are often characterised as either 'lumpers' or 'splitters', with the former favouring a more generalised approach which resulted in fewer, more broadly defined species, while the latter preferred to divide species into ever finer distinctions, often based on minute differences between specimens. While this was true across natural history as a whole, the matter is exacerbated in entomology, as insect species are by far the most numerous on the planet, and a great many discoveries continue to be made. In the nineteenth century, even those species native to Britain were still in the process of being fully identified and described, with Stainton himself at the forefront of such work within his specialism of microlepidoptera. Furthermore, intrepid entomologists such as Henry Walter Bates were gathering insects from the farthest reaches of the British Empire and beyond, pushing the limits of contemporary taxonomy and forcing those back home to revise their classifications.

The practice of collecting and setting insects as specimens played a vital role in determining species, as it permitted the study of their unique, distinguishing characteristics and comparison between each individual example. Classification was integral to the scientific (as opposed to the aesthetic) display of specimens, as this was a way in which similarities or differences could be highlighted. As previous chapters have shown, the ways in which collectors prepared their specimens was highly important, as improper technique or poor preservation could destroy many of the microscopic

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<sup>12</sup> John B. Heppner, 'Butterflies and Moths (Lepidoptera)', in *Encyclopaedia of Entomology*, ed. by John L. Capinera, 2nd edn (London: Springer, 2008), pp. 626-672.

differences that allowed for one species to be delineated from another. In current biology, a 'type' specimen is a specific specimen that is considered representative of the species, serving as the example of its defining features and to which all other specimens may be referred. Stainton's own collection, now held by the Natural History Museum in London, contains a large number of types.

It is clear, therefore, that any entomologist worthy of that name during this period would have had some grounding in the practice of classification, as it was through this means that they were able to identify the subjects of their research. Whilst it may be tempting to assume that periodicals were a medium through which systems of classification were standardised, enforcing a universally accepted scheme to facilitate communication between practitioners, no such process occurred during this period. One of Stainton's final editorials in the wake of his announcement to end the *Intelligencer* was on the subject of 'Arrangement'. However, rather than advocating 'one uniform system universally adopted' by all entomologists, he takes a more relaxed view, accepting that 'the impossibility of inducing all to accept equally the same precise articles of faith is a fact which is self-evident to naturalists in all that appertains to classification and arrangement'. With a flash of impatience that had not previously been evident in his editorials, Stainton dismisses the 'young entomologists' who demanded such a unified system, which he claimed 'proves their own ignorance and their own utter incompetence to legislate on matters they so little understand'.<sup>13</sup> Here, Stainton is assuming a position of scientific authority as a practitioner of classification himself, imputing a lack of knowledge among those who disagree with him.

It cannot be a coincidence that Stainton chose to raise this subject in the remaining days of the *Intelligencer*, and his vituperative tone suggests it is something that had caused a great deal of controversy and personal angst. Whilst it was not the sole reason for Stainton's change in attitude towards periodicals, it is highly probable that such an ongoing disagreement was not conducive to a cohesive and productive community as he had envisioned. Ironically, the very urge for a standardised system of arrangement seemingly brought about a divergence between older and younger entomologists. It was not until the twentieth century that taxonomy became internationally standardised, with entomology one of the last fields to adopt this practice. This is not necessarily due to conservatism on the part of entomologists, but rather the sheer diversity of insect life

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<sup>13</sup> *Intelligencer*, 10 (1861), p. 177.

(when compared to mammals or birds, for example), which hindered the task of amassing the comprehensive collections required for the application of a system.<sup>14</sup>

Although by the time of the *Intelligencer* there was some broad agreement regarding certain aspects of arrangement, it still remained very much a matter of personal taste. This, of course, only gave grist to the mill of controversy among entomologists. As observed by William Sweetland Dallas in his *Elements of Entomology* (1857), which was advertised in the *Intelligencer*, 'the same phenomenon is usually capable of being interpreted in several ways, according to the peculiar views of the observer'. There were a number of 'extraordinary systems' that Dallas regarded as akin to 'those ingenious artists who perform a very bad hornpipe on a tight rope, or on the back of a galloping horse'. The end result being 'undoubtedly curious', yet 'at the same time we feel that so much industry might have been much better employed'.<sup>15</sup> Stainton defended this lack of standardisation using the politically-charged language of reform, in particular alluding to the ongoing debates over enlarging the franchise, which would eventually result in the Second Reform Bill of 1867.

We are just as certain that any arrangement proposed in the coming season cannot be a final one, as we are that the Reform Bill to be passed in the ensuing session will itself ere long undergo modifications.<sup>16</sup>

Systems of classification remained fluid, therefore, despite the impulse towards standardisation from younger entomologists. However, what many more entomologists could agree upon was the necessity of practising classification for an individual to be considered truly scientific.

### **'The Chaff from the Wheat'**

At the commencement of the *Intelligencer's* fourth volume in April 1858, long before disillusionment set in, Stainton's customary leading article began 'there is a perfect rage for *examinations*', and cites the Civil Service, East India Company, and the Society of Arts as groups in which such tests of aptitude were now requisite. Stainton then asks

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<sup>14</sup> Robert E. Koehler, *All Creatures: Naturalists, Collectors, and Biodiversity, 1850-1950* (Princeton: Princeton University Press, 2006), pp. 239-245.

<sup>15</sup> William Sweetland Dallas, *Elements of Entomology: An Outline of the Natural History and Classification of British Insects* (London: John Van Voorst, 1857), pp. 53-54. For an example of the advertisement, see: *Intelligencer*, 3 (1857-58), p. 96.

<sup>16</sup> *Intelligencer*, 5 (1858-59), p. 121.

'would they not be very serviceable for entomology?'.<sup>17</sup> These comments should be set against the context of the 1850s 'mania' for written examinations, which James Elwick has described as an important process of standardisation, replacing the more traditional *viva voce* mode of oral questioning.<sup>18</sup> Naturally, there are a number of questions relating to how an examination could be applied to such a diffuse community of entomological practitioners. In the following issue, Stainton invites the views of 'those who are between seventeen and twenty years of age, and who feel they are studying entomology (and not merely playing at it)', in the hope that 'a sufficient number respond to this appeal' and it would thereby be possible to 'deduce some curious statistical information'.<sup>19</sup> This appeal elicited a range of responses, not all favourable. One correspondent, identified as 'Juvenis', applauded examinations as a 'capital plan' that would 'tend to make entomology studied and taken up more as a science, [...] than as a simple amusement'.<sup>20</sup> However, another letter from 'X.Y.' accused Stainton of wishing to reveal 'the slipshod character of the information possessed by many or most of us'. Despite having collected microlepidoptera for 'some years' and being in possession of a 'tolerable collection', X.Y. confessed that he 'could not describe a single genus so as to separate it from every other', knew 'but little about the antennae, less about the palpi, and nothing at all about the mouths of the different species'. Consequently, this particular 'entomologist' would 'as soon think of going in for an examination on the subject as of swimming across the Thames at London Bridge'.<sup>21</sup>

X. Y. was not an unusual case among the readers of the *Intelligencer*. They explicitly admit their complete ignorance of classification, placing them among the ranks of what J. O. Westwood considered to be the 'lowest form' of entomologist. However, as is made apparent by one correspondent, identified only as 'J. C. B.', an 'entomologist' who collected insects without any desire to study the specimens was not entitled to call themselves such:

In the present state of entomology in this country, something in the way of examinations would certainly be desirable; it would separate the chaff from

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<sup>17</sup> *Intelligencer*, 4 (1858), p. 1.

<sup>18</sup> James Elwick, 'Economies of Scales: Evolutionary Naturalists and the Victorian Examination System', in *Victorian Scientific Naturalism: Community, Identity, Continuity*, ed. by Gowan Dawson and Bernard Lightman (Chicago: University of Chicago Press, 2014), pp. 131-156.

<sup>19</sup> *Intelligencer*, 4 (1858), p. 9.

<sup>20</sup> *Ibid.*, p. 30.

<sup>21</sup> *Ibid.*, pp. 21-22.

the wheat, - it would separate those who *collect* insects from *entomologists*.<sup>22</sup>

While a 'collector' only accumulated specimens, much in the manner of acquiring stamps, an 'entomologist' was a man of science, interested in furthering knowledge of the natural world. Another letter, this time from T. J. Stainton (presumably a relation of the editor), made this clear:

I think examinations in Entomology are imperatively called for. They would do incalculable good, by showing who really *are* entomologists, and who are not; by making Entomology more respected; by improving the character of entomological literature, and by tending to check the puerile mania for *specimens*, which has of late been prevalent. In short, they would greatly benefit Entomology as a *Science*.<sup>23</sup>

As Alberti has observed, 'disentangling the reasons for naturalising proves very difficult, partly because natural history practices shade imperceptibly from science into recreation and leisure'.<sup>24</sup> The strict dichotomy drawn above is likely to be a gross oversimplification, but nevertheless, a great number of those who collected insects during the nineteenth century (and beyond) did not do so with any scientific objective in mind. As the previous chapters have demonstrated, the *Intelligencer* brought together a diverse range of individuals in such a way that could be both fruitful and potentially fraught with tension. The information circulated through its pages, with a focus on the practices of collecting, could be profitably read by those who wished to make a scientific study of insects, but equally by many who simply wished to collect insects for the sake of amassing an aesthetically pleasing collection. The characterisation of natural history as 'stamp collecting', wherein the acquisition of specimens is an object in itself rather than a means to a scientific end, is one that has often been used to denigrate many naturalists in both the nineteenth and twentieth centuries.<sup>25</sup> It is worth noting in passing that there are some striking similarities between natural history periodicals,

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<sup>22</sup> *Intelligencer*, 5 (1858-59), p. 181.

<sup>23</sup> *Ibid.*, p. 79.

<sup>24</sup> Alberti, 'Amateurs and Professionals', p. 123.

<sup>25</sup> Kristin Johnson, 'Natural History as Stamp Collecting: A Brief History', *Archives of Natural History*, 34 (2008), 244-258.

such as the *Intelligencer*, and the magazines devoted to stamp collecting which also first appeared during this period.<sup>26</sup>

It cannot be coincidental that the leading article that immediately followed the two discussing examinations was on the subject of collecting and the purpose thereof. Entitled 'The Study of Plants', Stainton reproduces a lengthy passage from an article by Joseph Dalton Hooker. Within the quotation lies the following statement:

Collecting for the mere sake of having specimens is an unworthy pursuit, in comparison with which collecting for sale is honourable; but a collection made with a view of study, and an herbarium so arranged and kept as to be the depository of the student's knowledge, and the materials for his further study, is of more importance than even books.<sup>27</sup>

This had been quoted a month earlier in an editorial of the *Gardeners' Chronicle*, and it is from here rather than the original that Stainton took the extract.<sup>28</sup> No commentary is offered until the following week, when he addresses the above quote, at which 'half our readers stand aghast!'. Stainton considers that 'collections of plants and collections of insects must stand in the same category', and that 'specimens are means, not ends':

Will such of our readers as are at present collecting 'merely for the sake of having specimens' please to be aware, as we are, of *the pleasure of making a collection*, we can assure those who have not advanced further that there are other and higher pleasures in store, if they will but go - onward, onward.<sup>29</sup>

When considered in the light of the ongoing discussions regarding entomological examinations within the *Intelligencer* at this time, what becomes apparent is that Stainton and many of his peers wished to reform the community. They were aware that a great number of the *Intelligencer's* readers who described themselves as 'entomologists' were, in fact, 'mere collectors' who made no contribution to science. Collecting should be a means to an end - and for the majority of those who considered themselves to be true, scientific entomologists, this meant engaging in the practice of classification.

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<sup>26</sup> For example, the *Stamp-Collector's Magazine* (1863-74) similarly served as a medium through which philatelists corresponded and exchanged with one another.

<sup>27</sup> *Intelligencer*, 4 (1857), p. 18.

<sup>28</sup> *Gardeners' Chronicle and Agricultural Gazette*, 13th March 1858, pp. 189-190.

<sup>29</sup> *Intelligencer*, 4 (1857), p. 25.

Although examinations are generally associated with professional positions, it is worth emphasising that there is no related discussion by Stainton or others advocating for paid positions in entomology. Their status as unsalaried 'amateurs' is never questioned, but only their knowledge and proficiency in the scientific study of insects. Focussing on this debate gives us an insight into the community of the periodical, and specifically how membership of that community was defined and negotiated. As with Ruth Barton's work on language and identity within the mid-Victorian scientific community, it allows us to examine 'the language of self-description' employed by correspondents to natural history periodicals.<sup>30</sup> As Barton and others have established, the distinction between 'professional' and 'amateur' was not considered an important one by nineteenth-century men of science. Instead, it was the distinction between collectors and entomologists that played a significant part in subsequent attempts to establish entomological periodicals, and to thereby shape a scientific community.

### **'We Cannot Do Without'**

Following Stainton's surprise announcement of the *Intelligencer's* discontinuance, W. Gates, a London-based 'entomological apparatus maker' whose business was advertised in the *Intelligencer*, wrote to Stainton expressing his disappointment at the periodical's end (the letter reading a little oddly due to a lack of punctuation):

I for one shall regret the discontinuance of the *Intelligencer* as I believe it has become as much a desiderata as any books upon the subject in fact it has become our weekly newspaper which we cannot do without.<sup>31</sup>

Edward Newman, the printer of the *Intelligencer*, gave notice in its final issue that he would 'be obliged to those gentlemen who have hitherto recorded observations on the economy of insects, or notice of captures, in the *Intelligencer*, to forward the same henceforward for publication in the *Zoologist*'.<sup>32</sup> The *Zoologist*, edited by Newman, was a monthly periodical, and therefore could not fulfil the same function as the weekly *Intelligencer* in terms of the rapid dissemination of correspondence discussed in chapter one. Writing in the *Zoologist*, the Reverend Joseph Greene implored 'some enterprising

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<sup>30</sup> Barton, 'Men of Science', p. 73.

<sup>31</sup> W. Gates to Stainton, undated, London, Natural History Museum, H. T. Stainton Correspondence from British Entomologists (MSS STA E 118:118), STAINT 36:118; the advert for Gates' business is placed in the *Intelligencer*, 10 (1861), p. 206.

<sup>32</sup> *Intelligencer*, 10 (1861), pp. 212.

entomologist' to 'undertake the editing of a weekly periodical of the nature of the late *Intelligencer*'. However, he cautions against such a publication becoming

a medium for either editor or correspondents to indulge in coarse vulgarisms and personalities. It is to this cause, and to this cause alone, that we are to attribute the gradual decay and final extinction of the *Intelligencer*.<sup>33</sup>

Greene is the same pupae-digging clergyman whose opinions on the subject of specimen exchange featured in the last chapter. Although he was a frequent contributor to the *Intelligencer* in its earlier years, he is noticeably absent in later volumes. The 'personalities' alluded to by the Reverend are not specific people as such, but rather the increasingly personal attacks made upon individuals during the acrimonious debates that raged in the pages of the weekly's latter-day issues. The previous chapter has shown how the debates over the propriety of specimen exchange devolved into squabbling and score-settling among entomological rivals, which not only reflected badly upon those who indulged in such behaviour, but also the editor for allowing his periodical to become the medium for such invective. Greene wished for a new periodical to be 'conducted in a gentleman-like and impartial spirit', invoking that same ideal as a standard to which all entomologists should be held. It would seem, therefore, that Greene disagreed with Stainton's editorial policy, and felt the *Intelligencer* was carried out in such a way that privileged a personal agenda dictated by the London entomologist and his coterie.

Stepping into the breach was Thomas Blackburn, 18 years of age, who established the *Weekly Entomologist* with the assistance of his even younger brother, John Bickerton Blackburn (1845-81), and their equally youthful friend, Edmund Martin Geldart (1844-85). An almost exact replication of the *Intelligencer's* format, little more needs to be said regarding its function. Geldart recalls in his self-indulgent autobiography, *A Son of Belial* (1882, published under the practically transparent pseudonym 'Nitram Tradleg'), that he and Thomas Blackburn shared editorial duties, taking it in turns to write the week's leading article. The Blackburn brothers are thinly disguised by Geldart as Tom and John Blackmore - the former apparently dubbed 'Dismal Timothy' by his sibling - and he fondly recalls his days of bug-hunting.<sup>34</sup>

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<sup>33</sup> *Zoologist*, 20 (1862), pp. 7970-7971.

<sup>34</sup> Edmund Martin Geldart (as 'Nitram Tradleg'), *A Son of Belial: Autobiographical Sketches* (London: Trübner & Co., 1882), pp. 99-115.

Geldart went on to work as a teacher, a curate, and a Unitarian minister, before disappearing on a night-time voyage from Newhaven to France, subsequently presumed to have taken his own life.<sup>35</sup>

Just like one of its editors, the *Weekly Entomologist* would come to an untimely end, barely lasting more than a year. This was largely due to lack of funds, a result of an inability to attract anything like the number of subscribers possessed by the *Intelligencer*, and the lack of private income among its editors did not afford them the luxury of running at a loss. Stainton had provided some financial backing, but this was withdrawn once it became clear that the venture was a lost cause. Furthermore, their decision to run the periodical from their home in Bowden, Cheshire, placed them at a disadvantage compared to the London-based *Intelligencer*. It bore the stamp of its provincial origins, and printing errors give it a slipshod character. We need not detain ourselves too long upon this periodical, but some notice is worth giving to a leading article, entitled 'Collectors and Entomologists', that Geldart admits to writing in his memoir, as it has a direct bearing on this chapter. Perhaps aping Stainton's stentorian editorial tone, Geldart asserted that 'a great difference of opinion prevails as to the propriety of designating all collectors of insects entomologists'. For many, Geldart continues,

Their professed object in collecting, is not to study insects, or even to classify them, but simply to make a display for their mantelpieces, to gratify their ideas of the beautiful, or to give them something to do when they have nothing else to employ their time. And yet, this latter class of collectors are often no less ardent in the pursuit of their game, than the most scientific Entomologist.

Employing a similar rhetoric as Stainton and Westwood before him, Geldart accused the 'mere Butterfly-catcher and chimney-piece ornament' of being 'utterly indifferent' to 'anything but the surface-beauty of his insects, and as ignorant as he is regardless of scientific facts'. In conclusion, he calls on 'every mere collector' to 'cease profaning the temple of Nature, by a wanton and aimless sacrifice of insect life, and show himself

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<sup>35</sup> R. K. Webb, 'Geldart, Edmund Martin (1844–1885)', *Oxford Dictionary of National Biography* (Oxford: Oxford University Press, 2004), <http://www.oxforddnb.com/view/article/10505> [accessed 27th June 2017].

deserving of the name of Naturalist'.<sup>36</sup> This article lost the periodical at least one subscriber, as a 'member of the house of Israel' cancelled his payment having understandably taken offence at Geldart's assertion that many 'mere collectors' were 'mercenary as a Jew' in the acquisition of specimens.<sup>37</sup>

Whilst Geldart and the Blackburn brothers clearly considered themselves to be true entomologists in their dedication to the scientific study of insects, it is probable that a large number of those who read the *Weekly* would have been of the 'mere collector' variety, just as with the *Intelligencer*. The common ground upon which this periodical community was based is the shared practice of collecting, but what differentiated the entomologists from collectors (at least in Geldart's eyes) was the practice of classification. This is comparable to the strategy of 'amateurisation' described by Samuel Alberti, through which individuals within communities of (non-professional) naturalists - in this case a periodical - sought to ensure that 'the advancement of scientific knowledge was the primary aim' of that community. However, while some may have endured such lecturing from a respected figure such as Stainton, it would perhaps have been less easy to stomach when coming from a precocious youth like Geldart. It is perhaps not surprising, therefore, that the *Weekly Entomologist* failed to gain much sympathy among those who ostensibly stood to gain from it.

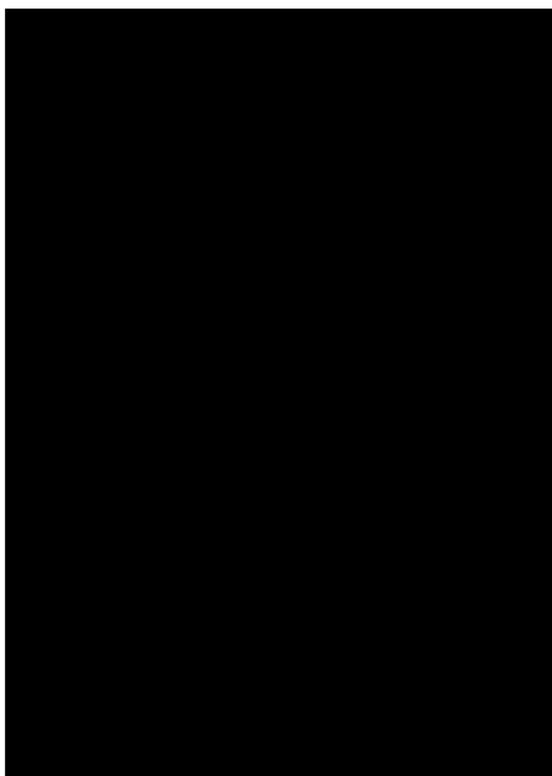
### **'A Firmer Basis'**

On the 5th March 1864, Thomas Blackburn was just short of his twentieth birthday (fig. 3.1 shows him considerably more advanced in years as the Rev. Canon Blackburn). Nevertheless, he was now firmly entrenched within the London entomological community, and after a meeting with the physician-lepidopterist Henry Guard Knaggs, Blackburn wrote to Stainton with a proposal for yet another periodical, a 'new entomological magazine, in the carrying out of which we desire to secure your cooperation'. This was before Blackburn embarked on his ecclesiastical career, but he had moved from his native Cheshire to London and found work as a civil servant, with his letters addressed from the 'Secretaries' Offices, Somerset House', and a subsequent note bears the stamp of the Inland Revenue (based in that London building). Blackburn continued, 'ever since the decease of the *Weekly Entomologist* I have been considering

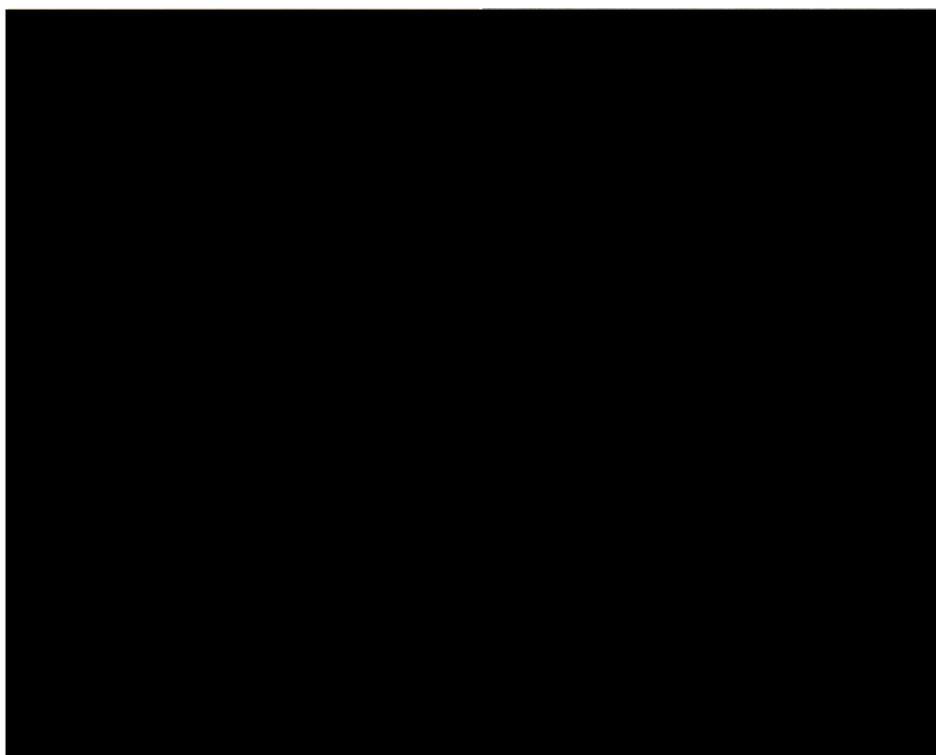
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<sup>36</sup> *Weekly Entomologist*, 1 (1861-63), pp. 25-26.

<sup>37</sup> Geldart, *Son of Belial*, p. 110.



**Figure 3.1** Thomas Blackburn. *Transactions of the Royal Society of South Australia*, 36 (1912), p. iv. This shows him in much later life as the Rev. Canon Blackburn.



**Figure 3.2** (Left) Henry Guard Knaggs. *Entomologist's Monthly Magazine*, 44 (1908), p. 49; (Right) Robert McLachlan. *Entomological News*, 15 (1903), plate XVI.

various plans for starting a paper on a firmer basis'.<sup>38</sup> The result of these deliberations was the detailed scheme he now laid before Stainton in this letter, and which would form the blueprint for the *Entomologist's Monthly Magazine*.

Blackburn first explained his decision to favour a monthly rather than a weekly publication schedule. 'In the first place, it will not involve so much labour on the part of the editors', and he wryly noted that Stainton would be painfully aware of this 'from experience'. 'Secondly, it will be more likely to have a larger sale, on the ground that it will be a less expensive work than if it were brought out weekly'.<sup>39</sup> This suggests that Blackburn envisioned the projected periodical as a more popular work, though as will be made apparent, his colleagues had other ideas. Despite his role as the initial instigator of the periodical, the project was quickly overtaken by more eminent men, who went on to form the first editorial committee of the *Entomologist's Monthly Magazine*, with Blackburn leaving after a few years to pursue his ecclesiastical career. Each man (except Blackburn) had a particular entomological specialism for which they held editorial responsibility. Stainton took on microlepidoptera, while the other insect orders were appointed to Henry Guard Knaggs, Robert McLachlan, and Edward Caldwell Rye. Knaggs became the primary driving force behind the magazine, with most of the major decisions made in consultation with Stainton and McLachlan.

These three men were all London-based, and good friends. Many of the editorial decisions were therefore made through face to face discussion at specifically arranged meetings (each taking it in turns to host the others), or through less formal exchanges when they attended gatherings of the Entomological or Linnean Society. Between these meetings, a constant dialogue was maintained through correspondence, and Stainton's archive gives us a fascinating insight into the process of establishing a periodical. Every detail of the magazine was subject to serious consideration, and presentation was of equal importance to the content, with Knaggs consulting Stainton as to the colour of the wrappers (enclosing a number of paper samples to choose from) and small details of typography.<sup>40</sup> In addition to the editors, the two other key collaborators were the publisher, John Van Voorst (a natural choice, as he was already well-known to Stainton), and the printer, Alexander Napier.

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<sup>38</sup> Thomas Blackburn to H. T. Stainton, 5th March 1864, STAINT 11:118.

<sup>39</sup> Blackburn to Stainton, 5th March 1864, STAINT 11:118.

<sup>40</sup> Henry Guard Knaggs to H. T. Stainton, 15th April 1864, STAINT: 59:118.

Brief biographical sketches of the editors other than Blackburn are highly instructive to any understanding of how the *Entomologist's Monthly Magazine* was formed. Henry Guard Knaggs (1832-1908, fig. 3.2) was a general practitioner with a thriving practice in Kentish Town, London, that he had inherited from his father. His particular entomological specialism was macrolepidoptera, possessing 'one of the finest collections of these insects in London', and dealing with all communications regarding this group to the *Entomologist's Monthly Magazine*.<sup>41</sup> Like many of the most notable entomologists of the nineteenth century, he must have been a man of considerable energy in order to pursue both his scientific interests and the demands of his profession. Knaggs recounts in one letter that an editorial meeting of the magazine was interrupted by an urgent case that he had no choice but to attend, though in the next sentence he admits that 'I am challenged to have a day at billiards!!', suggesting that he was not entirely overworked.<sup>42</sup> Ultimately, however, his practice and ill health took their toll, forcing him to leave the editorship of the magazine in 1874. Knaggs was replaced by J. W. Douglas, another friend of Stainton's, who had edited the *Substitute* (see previous chapter).<sup>43</sup>

Robert McLachlan (1837-1904, fig. 3.2) - or 'Mac' as he was fondly referred to by Knaggs - was a man of private means, allowing him a degree of freedom in the same manner as Stainton. An early interest in botany led him to embark, at the age of 18, on a voyage to Australia and China. He returned with a large collection of plant specimens, and made acquaintance with the botanist Robert Brown, who introduced him into 'scientific coteries'. Among those he met, John Van Voorst is credited with turning McLachlan's attention to entomology.<sup>44</sup> He went on to specialise in Neuroptera (net-winged insects such as lacewings), with his collection and house becoming 'a resort for neuropterists of all countries, and a focus of correspondence concerning Neuroptera from all parts of the world'. McLachlan was subsequently praised for creating 'a road to exactitude' in the study of these insects by 'establishing standards of procedure' that became widely adopted. He was one of the relatively few entomologists to be elevated into the ranks of the Royal Society (in 1877), and served as editor of the *Entomologist's Monthly Magazine* until his death in 1904.

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<sup>41</sup> *Entomologist's Monthly Magazine*, 44 (1908), p. 49.

<sup>42</sup> Knaggs to Stainton, 17th September 1864, STAIN 59:118.

<sup>43</sup> *E. M. M.*, 11 (1874), p. 1.

<sup>44</sup> *E. M. M.*, 40 (1904), p. 145-148.

Edward Caldwell Rye (1832-85) was the eldest son of a solicitor, but confounded expectations of following his father into this profession. Rye wished to pursue his passion and make a career in natural history, though his hopes of attaining a position within the Zoological Department of the British Museum were frustrated, forcing him to take up clerical work. His artistic talents allowed him to supplement his meagre salary through entomological illustration. Furthermore, he took up the post of librarian to the Royal Geographical Society in 1875, and held this post until his death. As one of the country's foremost authorities on beetles, Rye was responsible for Coleoptera in the *Entomologist's Monthly Magazine*. Another man of seemingly abundant attainments, he published extensively on this subject, and fulfilled various other editorial and bibliographical duties for a range of societies and institutions. An obituary described him as 'a good classical scholar, a good modern linguist', and a frequent prize-winner in boat racing. His productive life was cut short by smallpox.

None of the *Monthly Magazine's* original editors were professional men of science, and with the exception of Rye, never showed any significant inclination towards attaining a paid position for their scientific work. Taking Stainton's death in 1892 as our cut-off point, subsequent additions and replacements to the editorial team during this period follow a similar pattern. J. W. Douglas and Charles Golding Barrett were both civil servants (as was Blackburn in 1864), an occupation that afforded them long holidays in which to indulge their entomological interests. Edward Saunders (1848-1910), who joined in 1880, was a member of Lloyd's bank and 'exceedingly well known in business circles'.<sup>45</sup> William Weeks Fowler, who filled the space vacated by Rye's death in 1885, was a clergyman.<sup>46</sup> Joining the magazine in 1891, Charles George Champion bucks the trend somewhat, as he was the son of watchmaker, but was employed as a collector by the considerably wealthier naturalists Frederick DuCane Godman and Osbert Salvin, and spent a considerable time in South America. Upon returning to Britain, he continued working for Godman and Salvin, aiding with the classification of specimens and the subsequent publications based upon these, and in a very loose sense could be considered a professional of sorts. Finally, upon Stainton's death, the editors were joined by Thomas de Grey, 6th Baron Walsingham (1843-1919), who needless to say was far above any concerns of wage-earning.

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<sup>45</sup> *E. M. M.*, 46 (1910), p. 49.

<sup>46</sup> *E. M. M.*, 21 (1885), p. 1.

For the independently wealthy Stainton or McLachlan, there was clearly no financial necessity to turn professional, but this nevertheless runs counter to any impression we might have that science was increasingly the preserve of paid practitioners at this time. The preface to the *Monthly Magazine's* first volume boldly claimed that 'the very essence of a periodical like this is its amateur character (for what hired work is equal to a labour of love?)'.<sup>47</sup> This invokes, once again, notions of gentlemanly disinterestedness that were examined in the previous chapter, seemingly suggesting that any such work done with the object of earning money is thereby tainted and questionable. Many professionals took pains to disavow any such implication of venal motives in their scientific work. In this specific case, the amateur is held up to be the ideal practitioner, constructing an identity for the periodical and the community it aimed to create. Such rhetoric should be considered as a strategy of 'amateurisation', through which non-professional men of science attempted to establish authority within their field.

### **'My Ideal of a Magazine'**

This strategy of amateurisation is evident from the very early discussions of the *Entomologist's Monthly Magazine*, even before the title and form had been decided upon. When the proposition was laid before McLachlan, he made his opinion of scientific periodicals very clear.

If an entomological journal be established and I take any part of the editorship, I must be certain before connecting myself with it that it shall be a publication that will carry weight and not be filled with the trite and often [in]accurate observations of every person who is trying to work entomology. I know you will excuse me when I say that this was too often the case with the *Intelligencer*. Somebody that no one ever heard of sends a list of captures or some startling observations, almost with the sole desire of seeing himself in print, but with little regards to the correctness of his names or the accuracy of his observations[,] and thus errors creep in and are regarded as facts until some fine day the whole affair explodes and in doing so does more injury to the medium through which it appeared than to the author.<sup>48</sup>

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<sup>47</sup> *E. M. M.*, 1 (1864-1865), p. iii.

<sup>48</sup> Robert McLachlan to H. T. Stainton, 14th March 1864, STAIN 66:118.

McLachlan's concerns hinge on the desire for scientific accuracy and an unwillingness for his credibility as an entomologist and man of science to be compromised through association with a periodical of questionable veracity. McLachlan's plan for ensuring the accuracy of the magazine was to institute a method of endorsement:

In the event of the journal being set afloat it should be a rule that lists of captures from new or little known entomologists should be accompanied by an authority. Furthermore, I should religiously exclude all exchange lists unless inserted as advertisements and paid for.<sup>49</sup>

McLachlan's wish for potential contributors to be vouched for by an 'authority', by which he essentially meant someone known to him or his fellow editors, can be compared to the process of joining a gentleman's club or a learned society. Given the roots of the *Monthly Magazine* from within the Entomological Society of London, this has significant implications for the way in which the periodical would be managed. Whilst the *Intelligencer* was by no means free of such prejudice, the community represented by the *Monthly Magazine* was, from its inception, based upon the clubbability of metropolitan science.

The prohibition of exchange lists is another significant departure from the *Intelligencer*, as it was the controversy over such dealings that brought that earlier periodical into disrepute among many entomologists. The acrimony and accusations of ungentlemanly behaviour that were the subject of the previous chapter had no place in a periodical that considered itself to be scientific, and this was an attempt to prevent the newly projected magazine from descending into the same infighting that had plagued its predecessor. McLachlan's attitude towards this softened somewhat, and he eventually permitted small lists of duplicates to be printed on the magazine's covers, as he felt that 'the furore of exchange died with the *Intelligencer* and will not be resuscitated'.<sup>50</sup> Despite this concession, such transactions were effectively kept out of the main body of the periodical, as wrappers were very often discarded during the process of binding the individual issues into a single volume, and therefore the lists did not impinge on the scientific matter that McLachlan felt should be the primary focus of the *Monthly Magazine*. Despite his misgivings, McLachlan was 'convinced that a journal of this kind is wanted, more especially among provincial entomologists'.

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<sup>49</sup> McLachlan to Stainton, 14th March 1864, STAINTE 66:118.

<sup>50</sup> McLachlan to Stainton, 23rd June 1866, STAINTE 66:118.

My ideal of a magazine of this kind is one that should be supported by our leading men and contain such matter that should make it an authority both here and on the continent and cause it to be indispensable in the library of every entomologist. The *Intelligencer* in some respects was of this kind thanks to your own contributions but I cannot say as much for the *Weekly Entomologist*.<sup>51</sup>

McLachlan's 'ideal' periodical, therefore, would enforce a strict hierarchy, with the 'leading men' acting as gatekeepers of the community. This was, to some extent, true of the *Intelligencer*, with Stainton acting as an arbiter of what was published, but McLachlan takes this to new extremes in order to ensure a strictly scientific approach to entomology among the new periodical's contributors.

### **'Intelligencer Matter'**

Many decisions made in the founding of the *Entomologist's Monthly Magazine* are suggestive of the editors actively attempting to shape the community of their periodical. On the 13th May 1864, Knaggs wrote to Stainton that 'we shall have advertisements tomorrow in the *Reader*, the *Gardener's Chronicle*, & *Field*'. Had their funds permitted, Knaggs wished they could also have placed advertisements in the *Saturday Review*, *Athenaeum*, and the *Times*.<sup>52</sup> This would be granted, at least with regards to the *Athenaeum*, who advertised the *Monthly Magazine's* first issue later that month, on the same page as a notice for the eleventh serial-part of Charles Dickens' *Our Mutual Friend* (among many other books and periodicals).<sup>53</sup> Their choice of advertising medium, restricted by the cost, suggests that the editors hoped to attract an educated, middle-class, and largely metropolitan readership for their periodical. After 1869, the *Entomologist's Monthly Magazine* would carry adverts for *Nature* on its wrapper, and would in turn be featured in the advertisements section of this new weekly journal. This again suggests that the editors of the *Monthly Magazine* hoped to attract many of the same kind of scientifically engaged readers.

Less conventional forms of advertising were also employed, with the editors taking every opportunity to extend their periodical's reach. The following, from H. G. Knaggs, was perhaps the most unusual mode of dissemination discussed:

<sup>51</sup> McLachlan to Stainton, 14th March 1864, STAINTE 66:118.

<sup>52</sup> Knaggs to Stainton, 13th May 1864, STAINTE 59:118.

<sup>53</sup> *Athenaeum*, no. 1908 (21st May 1864), p. 695.

I met Dr Jenner a day or two ago and shall see him again tomorrow - he seemed to take an interest in us. I think I will ask him to put us on his table and then a lot of nobs will see us besides if he will do so it would look respectable.<sup>54</sup>

This illustrious Dr Jenner is - presumably - William Jenner, a leading pathologist and physician to Queen Victoria and the Prince of Wales. Knagg's assertion that many people of wealth and high status might see the *Monthly Magazine* if it was placed in the celebrated doctor's waiting room is, therefore, not entirely wishful thinking. His wish for the magazine to look 'respectable' is further evidence of the editor's wish to give entomology a degree of cultural cache that it did not currently possess, particularly when compared to more fashionable sciences such as geology. Despite the widespread taste for natural history, it seems entomology was still perceived by many to be 'futile and childish', as Kirby and Spence had complained earlier in the century. Butterflies aside, 'bugs' do not have the popular appeal of flowers, shells, or fossils. 'Respectability' is a complex issue in this period, but in this context it denotes the desire for approval among those of a certain social standing. This targeted marketing campaign is further demonstrated by a discussion of where to send review copies of the *Monthly Magazine's* early numbers, upon which subject Knaggs sought the advice of William Hill Collingridge, proprietor of the London newspaper the *City Press*. He was informed that the *Record* and *Guardian* in particular would 'do us good', as the former of these papers was 'taken in by almost every clergyman in the country'. Winning over both the aristocracy and the church would have been an excellent way to ensure entomology's place among the 'respectable' sciences.

The editors of the *Monthly Magazine* made a conscious choice not to replicate the *Intelligencer*, as demonstrated by a discussion over the first issue's content. Despite having more than enough copy to fill their intended 24 pages, it was suggested that they include additional pages of 'Intelligencer Matter'. Although this term is never explicitly defined, it is almost certain that this meant the inclusion of shorter notices and observations of the kind habitually published in Stainton's previous periodical. However, Stainton himself was unequivocal in his opposition to such a plan:

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<sup>54</sup> Knaggs to Stainton, 13th May 1864, STAIN 59: 118.

To this I entertain a very decided objection - the heavy and light matter must and will vary in the different numbers and 24 pages is quite as much as we shall fill on average. I daresay before the end of the season you will find that we are overrun with the lighter matter, and the solid unreadable articles are likely to be swamped.<sup>55</sup>

There is likely to be a strong element of facetiousness in Stainton's choice of words here, with his reference to 'unreadable' articles not entirely literal. All these letters were sent privately between friends who knew each other well, so it is natural that many are gently humorous in tone, often featuring in-jokes and sly references that can be impenetrable to any another reader.

That notwithstanding, it is telling that Stainton, the man responsible for the *Intelligencer*, should be against the inclusion of such material in the *Entomologist's Monthly Magazine*. It demonstrates the extent to which he wished to differentiate the new periodical from his previous venture, and also points to a change in attitude towards the purpose of such a periodical. He explicitly equates the *Intelligencer* with 'lighter' material, and his preference for the inclusion of 'solid' and 'unreadable' articles suggests that he had no intention of pandering to a more popular audience. Knaggs' reply confirms this view:

Although I was disposed to think that the number of supporters would be greatly increased by the addition of 4 pages of 'Intelligencer Matter' and that the bulk of our supporters would thus be more satisfied, I believe it will be best to leave it as it is.<sup>56</sup>

This statement is an explicit expression of the editors' wish to deliberately exclude a certain kind of reader from the periodical, as Knaggs was more willing to alienate potential subscribers than to admit 'lighter matter' into the magazine. McLachlan was a little more easy going: 'I am quite willing to agree to this if it be thought desirable and if we can see our way clear towards filling these extra pages with good sound matter'. However, he offered the following warning:

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<sup>55</sup> Stainton to Knaggs, 10th May 1864, STAIN 59:118.

<sup>56</sup> Knaggs to Stainton, 11th May 1864, STAIN 59:118.

I am fully alive to the impossibility of pleasing everybody and it seems possible that while we may gain additional subscribers of one class we may lose as many of another by making the mag. more 'popular'.<sup>57</sup>

This discussion between the editors demonstrates a conscious decision made by them to shape a very specific kind of community through their periodical, and an awareness of the different audiences attracted by certain types of content. The 'subscribers of one class' that would prefer 'Intelligencer Matter' were the very people that McLachlan had warned against - those who might flood the magazine with inconsequential and poorly observed notices. Instead, the *Entomologist's Monthly Magazine* was designed for a smaller, more select coterie of scientific entomologists, committed to the advancement of science and the practice of classification rather than simply indulging in a pastime. It is telling that Knaggs employs the language of class to define this difference, as the division is one that was largely determined along these lines, with working-class collectors being the ones precluded by the new periodical.

The 'heavy matter' referred to is best exemplified by the very first article in the magazine's opening number, which is a far cry from the short, gossipy notices published by the *Intelligencer*: 'New Species of Butterflies from Guatemala and Panama', written by Henry Walter Bates.<sup>58</sup> It was, of course, a work of classification, describing newly discovered species. Knaggs was especially pleased to have secured Bates as a contributor, calling it a 'grand thing for us', particularly as they were promised '10 descriptions per month for 8 months'.<sup>59</sup> Although of interest to many entomologists and deserving of attention, this is not information that could be put to practical use by the great majority of British insect collectors. It was much more akin to the kinds of paper read before the Entomological Society of London, and published in their *Transactions*. Much of the information in the *Intelligencer* was of transient interest, and although the periodical remains a valuable record of insect occurrences for this period, a great deal of its contents was only of value if immediately circulated. The *Entomologist's Monthly Magazine*, however, was envisioned as a much more lasting document of entomological knowledge. This was embedded in the very design of the periodical itself, with the editors discussing such things as pagination and what else to print at the head of each

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<sup>57</sup> McLachlan to Stainton, 9th May 1864, STAIN 66:118.

<sup>58</sup> *E. M. M.*, 1 (1864), p. 1.

<sup>59</sup> Knaggs to Stainton, 30th April 1864, STAIN 59:118.

page. In deciding whether to print the magazine's title at the beginning of each individual number, Knaggs preferred not to, as this would ensure 'a year of the mag. bound would look more like a book'. In Stainton's reply, he suggests the 'paging better be at the corners not in the middle being more easy for reference', while 'at the foot of each sheet I would put (No. 1 June 1 1864) as in the *Trans. Ent. Soc.*'.<sup>60</sup> As with many nineteenth-century periodicals, it was not envisioned as ephemeral. This was a serial produced with the express intention of being bound into a completed volume after each year, becoming a permanent repository of information. Stainton's wish to emulate the *Transactions of the Entomological Society* is also noteworthy, and points to the editor's intent that the magazine be more akin to such weighty scientific work.

There is evidence to show that the *Entomologist's Monthly Magazine* was successful in its bid to become a reference work of more than transitory interest. In 1882, a correspondent collectively addressed the magazine's editors in a letter that found its way to Stainton via J. W. Douglas, telling of the 'great convenience it would be to collectors if an index vol[ume] were to follow Vol XX of the magazine'. Each individual volume had an index, but this required searching through twenty different indexes to find the desired article, so a cross-volume compilation was proposed by the correspondent. Ease of reference aside, this was considered to be particularly vital, as 'most of the books to which lepidopterists daily refer were published long ago' - such as Stainton's *Manual* (1859) - and 'now nearly all that has been learnt about the British Lepidoptera since those works were published is to be found in the XVIII vols of the *E. M. M.*'.<sup>61</sup> The magazine, therefore, had come to occupy a central place in entomological literature. While a monograph would very often be rendered inaccurate very soon after its publication, the periodical allowed for near-constant revision of classifications.

### **'Butterfly Pictures'**

The first number of the *Entomologist's Monthly Magazine* was finally published in June 1864, and it continues to be published (albeit less than monthly) to the present day. In the period we are concerned with, up to the early 1890s, it remained remarkably consistent to its founding ideals, no doubt thanks to Stainton's continued guidance until his death in 1892. A few examples serve to illustrate how the editors employed the

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<sup>60</sup> Knaggs to Stainton, 11th May 1864, STAIN 59:118. A copy of Stainton's reply, dated 13th May 1864, is written on the back of Knaggs' letter.

<sup>61</sup> W. H. B. Fletcher to editors of the *Entomologist's Monthly Magazine*, 12th May 1882, STAIN 29:118.

periodical to present entomology as a reputable and, above all, scientific field of research.

The title page of each volume of the *Entomologist's Monthly Magazine* contained a quote, usually from some luminary of natural history, but occasionally a poet, as per the convention of many periodicals at this time. These quotations were generally chosen by the editors to make a certain point, and the very first such extract is a good example of how they were employed. It was taken from the writings of a French entomologist, Joseph Alexandre Laboulbène (1825-98), and reproduced in its original language:

J'engage donc tous à éviter dans leurs écrits toute personnalité, toute allusion dépassant les limites de la discussion la plus sincère et la plus courtoise.

[I therefore urge everyone to avoid in their writing all personality, all allusions which exceed the limits of the most sincere and courteous discussion.]<sup>62</sup>

Two things are immediately striking about the use of this quote. Perhaps most obviously is that it was printed in French, which suggests that the editors were already making certain assumptions about their intended audience. This was not a quote intended to be read by the razor grinders and handloom weavers that the *Intelligencer* had catered to, but rather a readership that were more likely to have some understanding of languages other than their native English. The allusion to 'personality' echoes the views of the Reverend Joseph Greene, who wished for a periodical that avoided the 'vulgarisms' and 'personalities' of the *Intelligencer*. The *Monthly Magazine's* editors once again wished to disassociate themselves from any suggestion of ungentlemanly discussion by avoiding the kind of personal attacks that became increasingly common in the previous periodical. McLachlan was particularly careful on this point, consulting his colleagues regarding some remarks (which unfortunately are not extant in the archive) that he felt 'smack somewhat of personality, and I especially wish to exclude personalities from the mag'.<sup>63</sup> Although debate was generally encouraged within the confines of a learned society, engaging in such controversy via print was generally frowned upon.<sup>64</sup>

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<sup>62</sup> *E. M. M.*, 1 (1864), p. i. I am indebted to Isabelle Staniaszek for her translation.

<sup>63</sup> McLachlan to Stainton, 13th February 1866, STAIN 66:118.

<sup>64</sup> For a brief discussion of how scientific disagreement was conducted, see: James Secord, *Controversy in Victorian Geology* (Princeton: Princeton University Press, 1986), pp. 21-23.

Furthermore, while arguments over scientific points could be seen as constructive, vituperative allegations of misconduct were undignified and degrading to all those involved.

Another such quote, placed on the title page of the *Monthly Magazine's* tenth volume, returns us to the overriding concern of the editors to distance themselves from the more recreational associations of natural history: 'entomology is a science, not a pastime'. This pithy line was from an address to the Entomological Society of London in 1873, by their incumbent president John Obadiah Westwood.<sup>65</sup> We have already encountered Westwood's views on those who engaged in collecting only for the sake of an ornament, so it is unsurprising that he continued to hold such opinions. The editors of the *Entomologist's Monthly Magazine* clearly approved of this sentiment, and ensured that their periodical championed this approach to insect collecting. This is further demonstrated by the following incident.

At the fifth annual exhibition of the West London Entomological Society at Grosvenor Square in December 1877, there was a vast variety of specimens to admire, including a hermaphroditic *Anthocharis cardamines* (orange tip butterfly) and a 'well-preserved' caterpillar of the lobster moth (*Stauropus fagi*). However, the correspondent sent by the London newspaper the *Echo*, whose report was reproduced in the *Entomologist's Monthly Magazine*, was disappointed to find that

In many of the collections of *Lepidoptera* the absurd fashion was adopted of arranging the insects in patterns regardless of their connection by species of family. Thus a beehive, an anchor, stars and crosses were figured - certainly very artistically - but they were of no value from a scientific point of view.

Appended to this notice was a brief word from the *Monthly Magazine's* editors, who wished to 'cordially endorse the foregoing remarks'. The making of such designs 'should not be deemed entomological work, nor be patronised by an Entomological Society'. They remarked that 'such things only excite the pity of scientific men and ridicule of others, extending not only to the makers, but also to entomology itself'.<sup>66</sup>

There is a strong class element to the above comments, as the members of the West London Entomological Society were one of a number of such groups whose

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<sup>65</sup> *Transactions of the Entomological Society of London* (1873), p. 1; *E. M. M.*, 10 (1874), p. i.

<sup>66</sup> *E. M. M.*, 14 (1877-78), p. 211.

membership appears to have entirely consisted of working-class men. It was founded in 1868, with meetings held every Wednesday evening from 8 to 10.30 at the Mason's Arms on Titchborne Street, Edgware Road. In 1874, the *Monthly Magazine* had published a brief article on the capital's entomological societies, which reveals that the West London society had its counterparts in the North, South, and the East. With the exception of the South London Entomological Society, which counted John Lubbock and Stainton himself as patrons, these groups are reported to have almost entirely consisted of 'working men'.<sup>67</sup> Very little other information is available regarding the West London society, which published no transactions or proceedings, but their choice of venue is certainly suggestive of a strong working-class membership.<sup>68</sup> More well-to-do societies, such as the South London or the Kensington Entomological Society, tended to meet in hired rooms rather than public houses. The *Entomologist's Monthly Magazine* was generally supportive of these societies, sometimes publishing reports of proceedings. The more middle-class South London Entomological Society was particularly favoured, and it was noted with approval that it held aloof from 'the dealing element' but, more significantly, was 'equally aloof' from 'mere collecting'. The outgoing president (a Mr Standen) had spoken on this theme in his address, and the *Monthly Magazine's* editors suggested that 'succeeding presidents will do well to follow in his footsteps'.<sup>69</sup>

An interesting coda to this question of entomological shows can be found in an obituary of John Thomas Carrington (1846-1908), the 'most Bohemian British lepidopterist'. A journalist by trade, he served as editor for a number of natural history periodicals, notably purchasing *Hardwicke's Science-Gossip* in 1893 and conducting that magazine until its end in 1902. Furthermore, he was appointed as a resident naturalist at the newly built Royal Aquarium at Westminster, London. In this capacity, he organised the first National Entomological Exhibition in 1878, hosted by this institution, and upon which the *Monthly Magazine's* editors poured a similar degree of scorn as they did on the aforementioned 'butterfly pictures'. The choice of venue was unfortunate, as although the Royal Aquarium had been built with the high-minded purpose of hosting scientific lectures and other such rational recreations, the need to

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<sup>67</sup> *E. M. M.*, 10 (1874), p. 185.

<sup>68</sup> For a discussion of the public house as a venue for working-class science, albeit earlier in the nineteenth century, see: Anne Secord, 'Science in the Pub: Artisan Botanists in Early Nineteenth-Century Lancashire', *History of Science*, 32 (1994), 269-315.

<sup>69</sup> *E. M. M.*, 16 (1879-80), p. 237.

turn a profit had led its directors to permit performances by circus and music hall-style acts. The *Monthly Magazine's* review stated that the exhibition was not only 'devoid' of any 'true scientific interest', but that it was 'a mistake to place it in connection with such sights as "Zazel the renowned" [a human cannonball act], and all the other sensational attractions of the Royal Aquarium'. The displays of specimens were 'exquisitely formed' with regards to 'aesthetic advantage', but were not accompanied by 'any illustrative lectures or explanations calculated to inform the spectators of the nature and value of entomology as a science'. The inevitable result, in the opinion of the *Monthly Magazine's* review, would be 'an increase in mere butterfly- and beetle-butchers, of whom too many already exist'.<sup>70</sup> However, it would appear that J. T. Carrington had the last laugh, at least according to one anonymous obituarist (almost certainly J. W. Tutt), who gleefully pointed out that in 1908, the year of Carrington's death, the Entomological Society of London hosted their first conversazione, which involved just such an exhibition. With a degree of relish, the article speculated that the 'bones of McLachlan, Stainton, and others must be turning in their graves at such desecration', claiming that the former's 'scathing denunciation' of such shows was 'as unfair as it was uncalled for', and concludes 'we, who know, are quite aware that scientific exhibitions need not be vulgar, and that the surroundings have little to do with the matter'.<sup>71</sup>

Stainton and McLachlan's objections to such shows, made through the medium of the *Entomologist's Monthly Magazine*, are noteworthy in that they display a strong concern for the public perception of entomology as a science. It is unlikely they would have concerned themselves with the butterfly pictures of working-class men had not a London newspaper chosen to bring them under public ridicule, therefore requiring an equally public attempt to distance the designation of 'entomology' from any such unscientific activity. Likewise, the National Entomology Exhibition was an event expressly designed to attract a large audience and thereby raise the public profile of entomology (in addition to attracting more patrons to the struggling Royal Aquarium). For those such as Stainton, who were attempting to establish entomology as a reputable science through such channels as the *Monthly Magazine*, having the worst excesses of insect collecting paraded before the public eye could only be considered as highly damaging to their cause.

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<sup>70</sup> *E. M. M.*, 14 (1878), pp. 260-261.

<sup>71</sup> *Entomologist's Record*, 20 (1908), pp. 123-124.

### 'Entomological Gossip'

'Mac tells me that our friend Newman has started a rival to our magazine', wrote H. G. Knaggs to Stainton in early April 1864, as their projected periodical gathered pace. 'Mac [McLachlan] seems to think that it is a bad job, but I really cannot see but that it is an excellent thing for entomologists generally'.<sup>72</sup> The editors of the *Entomologist's Monthly Magazine* were not the only ones who sought to establish a new publication of this kind and, as will become clear, Knaggs' sanguine acceptance of this did not last. Many saw Edward Newman, erstwhile printer of the *Intelligencer* and conductor of the *Zoologist*, as the man to remedy the void in entomological literature. He claimed that 'not only during the existence of the *Intelligencer* was I repeatedly pressed to undertake a journal devoted to the science', but in the time between that publication's end and the beginning of the *Weekly Entomologist*, 'I had not less than ninety-seven pressing solicitations to commence an entomological periodical'. Consequently, Newman resurrected the *Entomologist*, a periodical he had originally run from 1840 to 1842, but had then merged with the *Zoologist*. 'Like Rip van Winkle, it awoke after twenty years slumber, rubbed its eyes, and stepped forth amongst its living namesakes', the first issue appearing in May 1864, a month before the commencement of the *Entomologist's Monthly Magazine* in June.<sup>73</sup> Newman described the rebooted *Entomologist* as a 'popular monthly journal of British entomology and entomological gossip'.<sup>74</sup> This is worth contrasting with the *Monthly Magazine*, which made no such attempt to categorise itself as 'popular'. Susan Sheets-Pyenson includes the *Entomologist* in her study of popular natural history periodicals of the nineteenth century, but not its counterpart.<sup>75</sup> The mention of 'gossip' is of interest, as it denotes a less formal mode of discussion, and a year later would be self-consciously employed to that effect in the title of *Hardwicke's Science-Gossip*. This places Newman's *Entomologist*, therefore, very much in the footsteps of his other periodicals such as the *Zoologist* and *Phitologist*, a type of publication that belonged more to the 1840s and 50s than the changing landscape of the 1860s. There was a flourishing of scientific journalism during this

<sup>72</sup> Knaggs to Stainton, 4th April 1864, STAINT 59:118.

<sup>73</sup> *Entomologist*, 2 (1864-65), pp. v-vi.

<sup>74</sup> *Ibid.*, p. xvi.

<sup>75</sup> Susan Sheets-Pyenson, 'Popular Science Periodicals in Paris and London: The Emergence of a Low Scientific Culture, 1820-1875', *Annals of Science*, 42 (1985), 549-572 (p.569).

latter decade, culminating in the establishment of *Nature* in 1869 (albeit with less than auspicious beginnings), with science periodicals taking on new forms.<sup>76</sup>

Unlike the *Entomologist's Monthly Magazine*, we do not have an extensive archive through which to delve 'behind the scenes' of the *Entomologist*. That said, a very one-sided impression of Newman is provided by the *Monthly Magazine's* editors, who in the privacy of their correspondence were highly disparaging of their contemporary. This was a favourite subject of H. G. Knaggs in particular, with E. C. Rye referring to Newman as 'Knaggs' bête noire', but a very high proportion of the letters sent amongst the editors during their magazine's first year of existence make at least some passing reference to 'the Quaker'.<sup>77</sup> Neither party had been aware of the others' plan to establish entomological journals until both were too far committed to withdraw from the venture. Consequently, a rivalry sprung up between the two periodicals, leading to much bad blood between men who were all members of the Entomological Society of London (and a number of additional groups too numerous to list), and had many mutual acquaintances. It is important to note that in public, and through their respective periodicals, all the men concerned maintained an outwardly cordial appearance. Knaggs urged his fellow editors to 'prove ourselves at least as soft tongued and inoffensive as butter or at any rate as our worthy friend Mr Newman', suggesting that 'when he has slapped one cheek we have the cheek to turn to him the other'.<sup>78</sup> Inevitably, the dialogue regarding Newman between the editors of the *Entomologist's Monthly Magazine* tells us far more about their own preoccupations than it does about the *Entomologist*, providing further evidence of how Stainton and his friends wished to shape a very different kind of community through their periodical.

Knaggs bridled at the suggestion that the two periodicals should amalgamate, exclaiming to Stainton,

Our two journals are for such opposite purposes that they can hardly clash with one another - Mr Newman's is published solely to relieve the *Zoologist*, to act as a medium for inserting his own articles and for reprinting selections from contemporaries while ours is brought forward solely with a view to

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<sup>76</sup> Ruth Barton, 'Just Before *Nature*: The Purposes of Science and the Purposes of Popularisation in some English Popular Science Journals of the 1860s', *Annals of Science*, 55 (1998), 1-33.

<sup>77</sup> E. C. Rye to H. T. Stainton, 11th March 1865, STAINTE 88: 118.

<sup>78</sup> Knaggs to Stainton, 4th April 1864, STAINTE 59:118.

supply the public with a cheap and good entomological magazine in which original observations more especially will be recorded.<sup>79</sup>

The emphasis on originality is key here, as it reduces Newman to a mere cut-and-paste journalist, profiteering from the hard work of others. However, the key difference between the periodicals is their intended audience, as demonstrated by Newman's preface to the *Entomologist's* third volume. He stated that the completed volume's price of seven shillings placed it 'well within the reach of every collector of insects', again echoing similar concerns of affordability that were a consideration for all self-described 'popular' journals. Furthermore, Newman wrote that 'I use the term "collector" advisedly', as 'we have, in days gone by, met with aspirations that we should become "entomologists", something better than "mere collectors"'. To attain this promotion, according to Newman, a collector must

Give up the fields and forests, the lanes and the streams; give up the net and laurel-box, and take to writing in a language that no one can read; [...] print alternate words in Italics, and stop every third word in the middle.

Newman proudly proclaimed that he was a 'mere collector', and that the *Entomologist* was the 'collector's organ, his medium of communication with his friends', and also 'the fountain-head of new friendships innumerable'. This florid prose is representative of Newman's style, who continued in this bombastic strain to assert that his periodical 'wends its way once a month into almost every hamlet in the United Kingdom'.<sup>80</sup> This is almost certainly an exaggeration, but the *Entomologist* clearly proved a viable venture, as the periodical survived Newman and continued into the twentieth century under different editorship.

### **'Science Twaddle'**

The main crime Newman seemed to be guilty of, at least in the eyes of Knaggs, was that of commercial opportunism. Upon being informed by a correspondent identified only as 'Horn' (probably William Horn, a contributor to the *Entomologist's Monthly Magazine*) that 'Newman's new serial is a "sell"', Knaggs noted to Stainton 'how funny that he should pitch on to that word'.<sup>81</sup> Although Newman's position as head of a printing firm

<sup>79</sup> Knaggs to Stainton, 23rd May 1864, STAINT 59:118.

<sup>80</sup> *Entomologist*, 3 (1866-67), p. v-viii.

<sup>81</sup> Knaggs to Stainton, 28th May 1864, STAINT 59:118.

would have saved him some expense in producing his own periodicals, it must be remembered that he was also a businessman who could not afford to run magazines at a loss. This may have informed his avowedly populist rhetoric, appealing to the 'mere collectors' who far outnumbered the more select number of 'entomologists'. Furthermore, Newman remained committed to a conception of natural history as a science that could be pursued by a broadly construed community of practitioners, as is evident in all the 'popular' periodicals he had a hand in producing. These two impulses, on the one hand financial and perhaps more idealistic on the other, are not mutually exclusive, of course, but it places Newman's *Entomologist* in a very different category to the *Entomologist's Monthly Magazine* and its eschewal of 'Intelligencer matter'.

Great amusement was afforded Knaggs and his colleagues by a practical joke played by Edwin Birchall (last encountered arguing over exchange etiquette in the previous chapter) on Newman, sending in an observation to the *Entomologist* regarding the question of whether insects experienced pain. Birchall asserted that 'I know an instance of a spider having been accidentally shut into a hot oven by a servant girl, and the poor thing in its pain screamed as almost to freeze the blood!'. Newman obligingly published this in his periodical.<sup>82</sup> Knaggs informed Stainton that Birchall was 'evidently chaffing E. N. when he sent the extract'.<sup>83</sup> As a respected entomologist and writer on natural history, it seems somewhat unlikely that Birchall would have passed on such a far-fetched anecdote with any genuine credence. Furthermore, it is a safe assertion that gossipy remarks of this kind would never have been entertained by the *Entomologist's Monthly Magazine*. Knaggs subsequently recounts to Stainton, with evident delight, that he had received a 'screaming' letter from Birchall, who complained of Newman 'cutting up his [Birchall's] brother's letter into scraps to stop holes in his verminous corner'. Newman had reproduced a short extract of a letter from Henry Birchall to Edwin Birchall, presumably provided by the latter of the two brothers, though the cut-and-paste manner in which it had been treated by Newman was seemingly what Edwin Birchall objected to.<sup>84</sup> Again, this strongly implies an unflattering opinion of the *Entomologist's* editor as indiscriminate with regards to acquiring copy for his periodical, more eager to fill up space than uphold any pretence of integrity.

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<sup>82</sup> *Entomologist*, 2 (1864-65), p. 152.

<sup>83</sup> Knaggs to Stainton, 8th January 1865, STAIN 59:118.

<sup>84</sup> *Entomologist*, 2, p. 163; Knaggs to Stainton, 8th February 1865, STAIN 59:118.

Although they were at pain to exclude 'personalities' from their periodical, the *Monthly Magazine's* editors continued to cruelly mock Newman in the privacy of their correspondence. Knaggs lampooned the printer as a 'cheap jack' - a hawker of inexpensive, inferior goods - by penning an imagined diatribe in which Newman attempts to flog his wares in the manner of a London street-seller:

I'm going to offer you the cheapest lot as ever was offered to an enlightened public[.] Here's 22 of the cleverest books that ever was written though I says it myself as oughtn't [I] for I wrote 'em almost all myself 'cept what I cribbed from other people - they are all bound in superb yellow covers with impossible caterpillars with improbable legs and segments crawling up and down - what do you say for the lot?

In the face of his audience's obvious indifference, this fictional Newman gradually lowers his asking price, and even offers to 'chuck yer in the index as'll tell you where to find the screaming spider'. Finally, he vows to give his books away to 'needy persons as has the taste but hasn't the means to indulge in natural pursuits'. Knaggs signed this satirical note as 'Ed. Sciencetwaddle', and offers an explanation to this in a postscript.

Science Twaddle - this is the name given by the *Entomologist* to itself to distinguish it emphatically from a magazine called *Science Gossip* which is enriched by many valuable contributors.<sup>85</sup>

The 'valuable contributors' to *Hardwicke's Science-Gossip* included the likes of Knaggs and McLachlan. Stainton himself wrote a single article, and perhaps would have done more had it not been for an ill-tempered exchange with the magazine's prickly editor, M. C. Cooke, which resulted from an unfortunate misunderstanding over the illustrations for Stainton's piece.<sup>86</sup> While Newman had previously been considered a man of science in his own right, it would appear that opinion had altered against him. The suggestion of 'cribbing' his work from others is particularly telling, as is the imputation of entomological inaccuracy in the illustrations adorning the covers of his work. The printer was now reduced to a mere street-hawker of shoddy, second-hand goods. Newman's populist approach to participation in natural history was no longer

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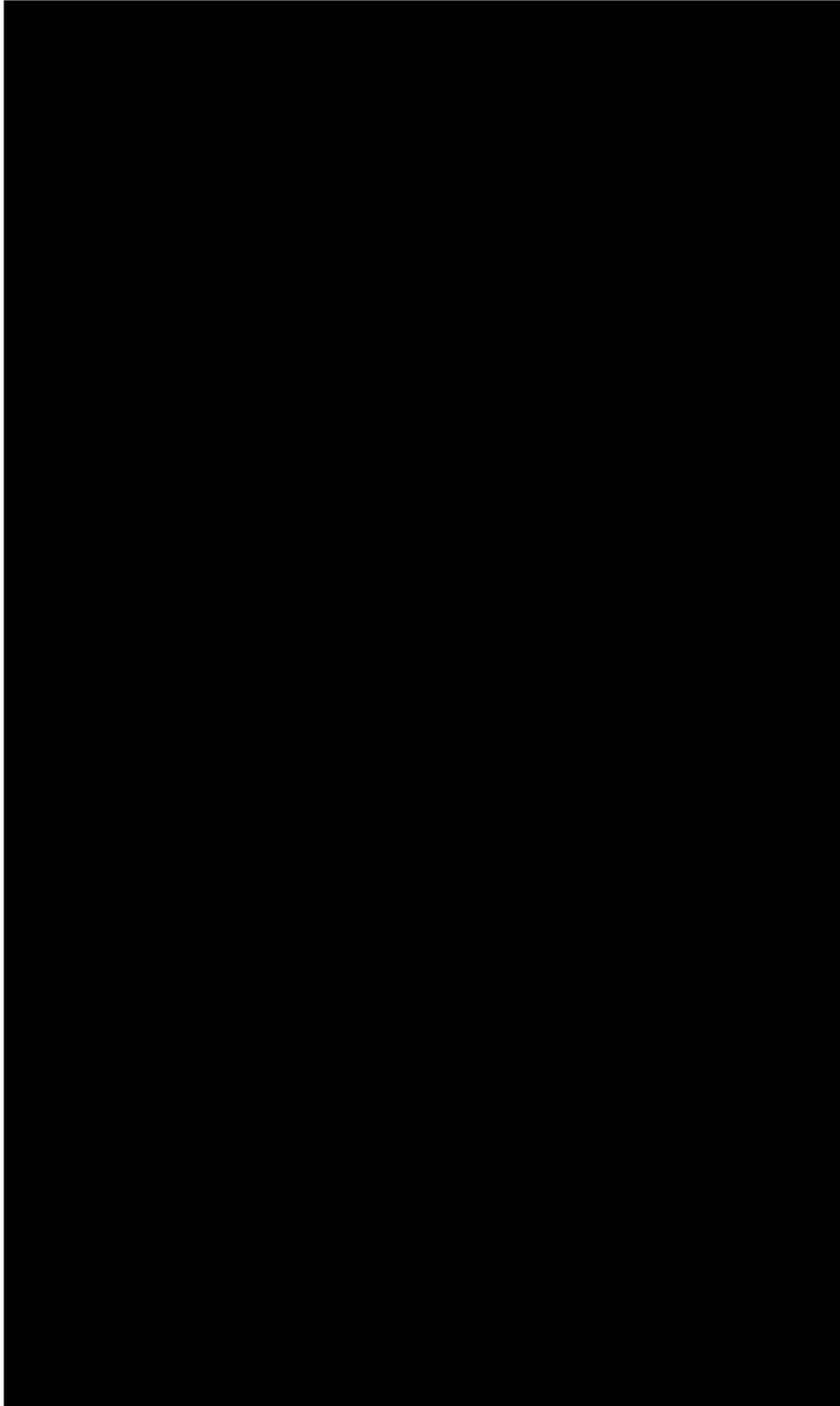
<sup>85</sup> Knaggs to Stainton, 21st December 1865, STAIN 59:118.

<sup>86</sup> M. C. Cooke to H. T. Stainton, 5th June 1867 and 13th August 1867, STAIN 20:118. Unusually, copies of Stainton's replies are included alongside Cooke's letters in the archive: Stainton to M. C. Cooke, 21st June 1867, 5th August 1867, and 16th August 1867, STAIN 20:118.

considered entirely desirable, as others hoped to forge a more exclusive community of elite practitioners. Newman himself, who had once been an important part of a broadly defined scientific community, now found himself marginalised by those who set themselves up as arbiters of this new conception of science.

Comparing the index to contributors in volumes of the *Entomologist* (or the *Intelligencer*) with the *Entomologist's Monthly Magazine* is instructive, as it provides an immediate impression of the kind of community formed by these periodicals. What is striking about the *Monthly Magazine's* lists of contributors is their relative shortness, often taking up just a single page. This points to a greater level of exclusivity, reinforced by the decision to include post-nominal initials to all those who were members of scientific societies. This makes apparent that a large number of the contributors were Fellows of the Entomological Society of London, which places them among a select group of practitioners. There are others who are Fellows of either the Linnean Society or the Zoological Society, and Alfred Russel Wallace belonged to the Royal Geographical Society. Stainton and Robert McLachlan both held the highest honour as Fellows of the Royal Society (Stainton from 1867, McLachlan from 1877). There is a clear hierarchy demonstrated by which of these initials are chosen for display - both McLachlan and Stainton's names were followed by F. L. S. (Fellow of the Linnean Society) before being elected to the Royal Society, at which point this took precedence. The Linnean Society in turn took precedence over their allegiance to the Entomological Society, suggesting that the latter was the least prestigious of such associations.

The *Entomologist's Monthly Magazine* and the *Entomologist* had very different readerships, or at least, very different expectations of the communities they served. Crucially, it was not a question of professional practitioners excluding so-called 'amateurs', but rather a select group of non-professionals who were more concerned with entomology's claim to be thoroughly 'scientific'. Even if the rhetoric of amateurisation in the *Monthly Magazine* was not always explicit, the periodical itself should be considered in itself as an act of amateurisation. The decisions taken by the editors in what they chose to publish, and thereby the kind of community that was formed through the periodical, reflect their vision for entomological science. No longer was it the preserve of bug-hunters and 'mere collectors' - as championed by their rival Newman - but a more disciplined and scientifically engaged group of practitioners.



**Figure 3.3** *Entomologist's Record and Journal of Variation*, 1 (1890), front cover. The illustration is by Frederick William Frohawk (1861-1946), who would later become an eminent entomologist and zoological artist. Despite the biological focus of the periodical, the emphasis on fieldwork and collecting is demonstrated by this image, which is more evocative of natural history than experimental or laboratory-based science.

## A Journal of Variation

By 1890, both the *Entomologist's Monthly Magazine* and the *Entomologist* were well into their third decade of existence. Whilst the former remained largely unchanged, the *Entomologist* had undergone various alterations in its editorial staff and content. Upon Edward Newman's death in 1877, his son - Thomas Prichard Newman - took over the family business and continued production of his father's periodicals. John T. Carrington, the 'Bohemian' lepidopterist, stepped into the role of editor, assisted by a number of other entomologists in a way similar to the method adopted by the *Monthly Magazine*. In 1889, for reasons that are unclear, Thomas Newman chose to give up his proprietorship of the *Entomologist*. It was purchased by John Henry Leech (1862-1900), a wealthy lepidopterist who relied on a network of collectors to supply him with specimens from all over the world, but particularly China and Japan. Leech intended the *Entomologist* to be a medium through which to publish the work of classification done upon these insects, and installed the curator of his collection, Richard South (1846-1932), as editor of the periodical.

However, Leech's plan did not meet with widespread approval, causing a 'storm of indignation'.<sup>87</sup> James William Tutt complained to Stainton:

I suppose you know that Mr Leech has brought the *Entomologist* from Mr Newman and that South, Mr Leech's curator, will be his editor in future. If Mr South calls an insect *nemoralis* the *zetterstedii*, then calls it a new species *taeniadactylus*, and then changes his mind and thinks it is not and finally winds up with a suggestion that the species may yet be *nemoralis* as he first supposed - I don't know what the *Entomologist* will be like in a few months. Mr South has so upset the 'plumes' that I rather dread him as editor.<sup>88</sup>

The 'plumes' are a family of Lepidoptera - moths characterised by their unusual wings - and Tutt was clearly unimpressed with South's classificatory work. This wrangling over species is typical of many entomological disputes of the nineteenth century, but what is more interesting here is Tutt's (not unreasonable) assertion that a man who has demonstrated such apparent ineptitude in the practice of classification would be an

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<sup>87</sup> *Entomologist's Record*, 13, p. 84.

<sup>88</sup> James William Tutt to H. T. Stainton, 22nd December 1889, STAIN 97:118.

unsuitable editor for an entomological magazine devoted to publishing systematic work. Tutt's dissatisfaction with the *Entomologist* must have been a driving force behind his decision to begin his own periodical in 1890, entitled the *Entomologist's Record and Journal of Variation* (fig. 3.3). He stated in his opening address that 'the two London journals devoted to the science are doing good work in the more strictly scientific and descriptive branches of the subject', but Tutt wished to 'supply a magazine devoted entirely to the wants of British entomologists'.<sup>89</sup> This was a direct swipe at what he saw as a preponderance of work on non-British species, particularly in the *Entomologist's Monthly Magazine*, which was far less useful for those who collected closer to home.

James William Tutt (fig. 3.4) was a schoolmaster and a man of considerable energy and entomological attainments, but also notorious for his outspoken and dogmatic manner. It seems his profession led him to address everyone as if they were the young boys under his charge. As Tutt observed to one friend, 'I know I am brutal in the way I put things, but I can't help it, and you know I am right'.<sup>90</sup> As fellow London residents and regular attendees at the Entomological Society, Tutt and Stainton knew each other, but their limited correspondence suggests mutual respect rather than friendship. Amongst Tutt's prodigious output of work, he is most widely remembered as one of the first to observe the phenomena that came to be known as 'industrial melanism', publishing a paper on this in the *Record's* first issue.<sup>91</sup> The notable increase in darker-coloured specimens of the otherwise pale peppered moth species that were taken during this period have since become a classic example of natural selection in action, demonstrating an evolutionary adaptation by which the black insects were more effectively camouflaged against tree trunks stained by nineteenth-century air pollution. Tutt's interest in natural selection and the subject of his paper are a crude but undeniable indication of his approach to entomology, which differed from many of his predecessors and peers.

Not content with simply describing new species from dead specimens, Tutt took a more biologically-orientated interest in the habits and physiology of insects. His was a distinctly post-Darwinian approach, as exemplified by his book, *A Natural History of the British Lepidoptera* (1899-1909). The very first chapter on 'the origin of the

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<sup>89</sup> *Entomologist's Record*, 1, p. 1.

<sup>90</sup> *Entomologist's Record*, 23 (1911), p. 115.

<sup>91</sup> *Entomologist's Record*, 1, pp. 5-7.

Lepidoptera' begins 'for many years entomologists have attempted to work out the line of descent by which Lepidoptera have been evolved'.<sup>92</sup> Naturally, the *Entomologist's Record* reflected Tutt's preoccupations, and the emphasis on variation in the title signals this. Nor was Tutt alone in this Darwinian turn, moving away from strictly descriptive and classificatory entomology. Lord Walsingham (1843-1919), who served as President of the Entomological Society in 1889-90, observed in his address that 'there is one branch of our study which has shown a tendency to unusual development during the past year', specifically 'that which deals with those problems to which the minds of men have been turned by the researches of Darwin, Wallace, Weismann, Meldola, Poulton, and many others'. Referring directly to the *Entomologist's Record*, he welcomed 'a new publication devoted entirely to such subjects'.<sup>93</sup> J. F. M. Clarke has written on the changes occurring within the Entomological Society of London at this time, with those who favoured a biological and physiological approach to entomology gaining ground over the old guard of systematists.<sup>94</sup>

Given these changes, it is perhaps surprising that Tutt's *Record* was by no means an entirely different periodical to Stainton's *Intelligencer*. First and foremost, correspondence was the driving force behind both journals. As Tutt wrote in his introductory address, 'much of the more important information I have learned from other entomologists has been obtained in a casual way from letters'.<sup>95</sup> Published correspondence was organised under a variety of headings, with a great deal of space dedicated to 'Notes on Collecting'. In addition, the *Record* provided its readers with an exchange column in much the same way as the *Intelligencer*. This suggests that, despite the advances of biological entomology, the practices of natural history remained strong. Tutt himself was an avid collector, as this provided valuable evidence for his work on variation. In the *Record's* 'century number' of 1901, retrospectives on the progress of entomology written by a number of leading practitioners demonstrate the shifts that had occurred. Frederick Merrifield (1831-1929), a London attorney who practised experimental entomology, described insect specimens as 'decorative corpses' that gave no indication of myriad processes that constituted the living organism.<sup>96</sup> However, the

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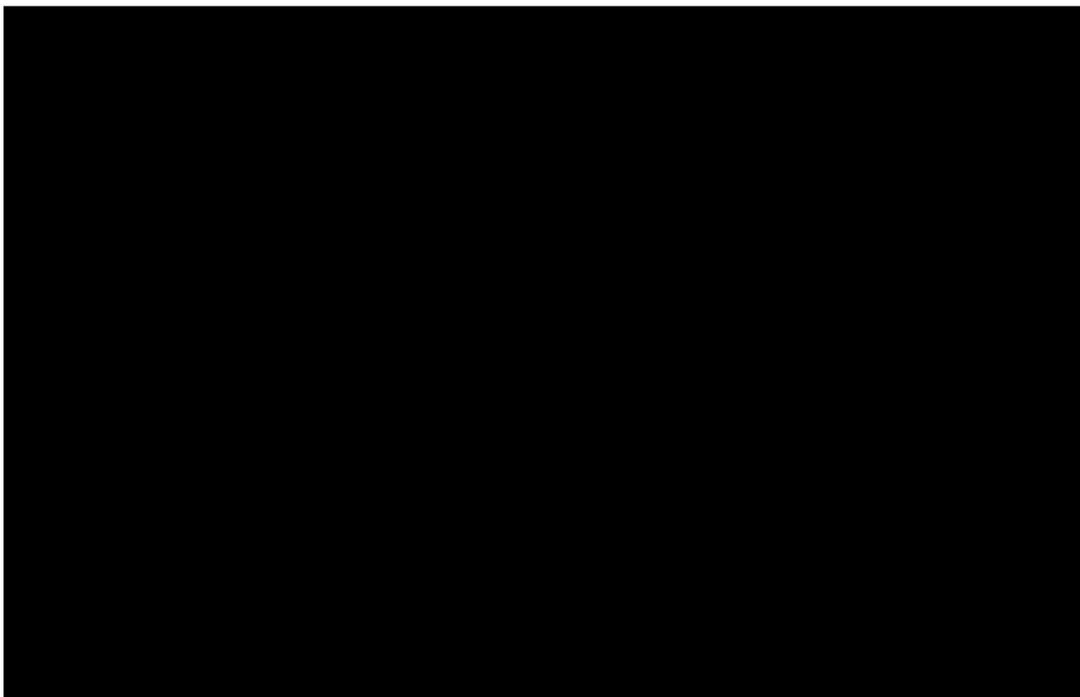
<sup>92</sup> James William Tutt, *A Natural History of the British Lepidoptera*, 10 vols (London: Swan Sonnenschein, 1899-1909), 1 (1899), p. 1.

<sup>93</sup> *Transactions of the Entomological Society of London* (1890), pp. xlix-l.

<sup>94</sup> Clarke, *Bugs and Victorians*, pp. 114-131.

<sup>95</sup> *Entomologist's Record*, 1 (1890-91), p. i.

<sup>96</sup> *Entomologist's Record*, 13 (1901), p. 27.



**Figure 3.4** James William Tutt. *Entomologist's Record and Journal of Variation*, 23 (1911), plates IV and V. The image on the right shows Tutt collecting in the field, a practice that was just as central to his biological approach as it was to those who concerned themselves with classifying.

lepidopterist Thomas Algernon Chapman (1842-1921) - a physician by profession - suggested that the 'mere collector' was of use in gathering material, 'and is perhaps more numerous than formerly'. However, the 'mere systematist', that is 'the man who wants to arrange things', was now extinct, with 'systematics' taking on its present-day meaning of delineating a species' evolutionary line of descent.<sup>97</sup>

### **Conclusion**

Both continuity and change are demonstrated by J. W. Tutt's defence of 'collectors' in the *Entomologist's Record* of 1890:

'Only a collector!' With a slightly cynical smile or still more meaning look, this phrase frequently falls from the lips of one entomologist to another, as they are picking to pieces the scientific character of a mutual acquaintance.

Tutt refuted such elitism, arguing that 'the real collector is a scientific force in our study, and a most valuable unit too'. In language that echoes elements of Stainton's claims

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<sup>97</sup> Ibid., p. 32.

from earlier in the century, Tutt emphasises the necessity for a communal, cooperative approach to science:

Why should the term 'collector' be considered such a disparaging one? Is not the man who makes observations for himself improving himself, and thus benefitting the community? Is not the man who collects insects, and makes observations, and gives both the insects and observations to those who have more time and a better opportunity for using them, a scientist in the truest sense? Is not every brother of the net who does this doing his share towards the one great whole, in the principle of 'Little drops of water', etc?

Tutt's use of the term 'scientist' - a word that was yet to gain widespread acceptance by practitioners at this time - hints at shifts that were occurring in science more broadly. It also raises interesting questions of how non-professionals, such as the schoolmaster Tutt, chose to identify themselves and others, and how such identities were being negotiated in this period. It is further evidence of 'amateurisation', by which the scientific credentials of such 'amateurs' were emphasised. This apparently reiterates the less exclusive rhetoric of the *Intelligencer*, and in particular Stainton's claim that an observation made by a Spitalfields weaver was of equal value to that of an Oxford or Cambridge professor. The similarities in Tutt's language are most striking in the following passage:

Some of our best observers are working men, who could not translate a line of German, and have never seen the inside of a Latin grammar, but they may be 'scientists' for all that, although they are 'collectors'.<sup>98</sup>

It would seem, therefore, that despite the changes that had occurred since the days of the *Intelligencer*, there remained a place in science for the 'collector'. The traditions and practices of natural history remained strong, even if they now served an alternative purpose in supporting the ascendant field of biology. However, Tutt's defence of such individuals demonstrates that their position within any form of scientific community was becoming increasingly contested.

Tutt would later describe the 'entomological world' as a 'strange human mixture', 'its units bound together by a common interest in the handiwork of Nature'.<sup>99</sup> Although this

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<sup>98</sup> *Entomologist's Record*, 1 (1890), pp. 99-100.

chapter is ostensibly about the practice of scientific classification, it is much more about how entomologists (or indeed, 'mere collectors') chose to classify themselves and each other. Entomology and entomologists struggled for recognition during the nineteenth century, hindered by the apparent insignificance of their chosen objects of study, but also due to their reputation for dilettantism and an association with the more recreational aspects of natural history. The *Entomologist's Weekly Intelligencer*, with its focus on collecting and exchange, embodied a broad community of practitioners who shared these practices in common, but pursued insects for reasons that did not always match the scientific aims of such luminaries as Stainton and some of his colleagues in the Entomological Society of London. The demise of the *Intelligencer* and the subsequent decision to establish a new periodical that deliberately distanced itself from its predecessor was a deliberate attempt to preclude 'mere collectors' from participation in this more select community. The practice by which the 'entomologists' and the 'collectors' were arbitrarily divided was, for the most part, that of scientific classification. Given the non-professional status of those responsible for the *Entomologist's Monthly Magazine*, this can be considered a strategy of 'amateurisation', consciously pursued in the face of the changing status of science and those who pursued it, within nineteenth-century society from the 1860s onwards. However, the *Entomologist's Record* demonstrates the persistence of natural history practices, even in the face of biology's rise to prominence by the end of the century.

Just as the previous chapters have challenged notions of 'high' and 'low' science in mid-nineteenth-century natural history, this chapter continues to demonstrate that such boundaries were by no means clear cut as we proceed into the second half of the nineteenth century. That notwithstanding, the 1860s saw a shift in the way certain practitioners conceived of themselves and viewed the work of others. While previous narratives have pointed to professionalisation and the rise of biology as the key fault-line upon which the broadly construed natural history community became divided, there is strong evidence to suggest that a far more complex process was being enacted. The *Entomologist's Monthly Magazine* is a clear attempt to police the boundaries of a scientific community, but this is not according to the strict lines of 'professional' and 'amateur'. The case of Edward Newman exemplifies how the ground had shifted, as while this former morocco leather manufacturer had once been afforded some of the

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<sup>99</sup> *Entomologist's Record*, 6 (1895), p. 8.

highest accolades within natural history, he had become a joke amongst those who considered his approach outmoded. The identities - and therefore the communities - that practitioners sought to fashion for themselves remained fluid during this period, and periodicals increasingly became the place through which these competing agendas were articulated.

Questions remain regarding how natural history periodicals continued to shape scientific communities in the second half of the nineteenth century, redefining the meaning of participation in science. The *Entomologist's Monthly Magazine* has demonstrated the important role that scientific societies played in mediating participation in science in the nineteenth century, and the close relationship these groups had with periodicals. The next and final chapter will widen its focus from entomology and the Entomological Society of London in order to examine natural history and the practise of association more broadly.

## CHAPTER FOUR

### Associating

If you had been in London at around eight in the evening on Monday, 2nd June 1856, and called by 12 Bedford Row, Holborn, you would have found yourself in the company of the capital's foremost experts on the subject of insects. A meeting of the Entomological Society of London is in progress. Amongst them is Henry Tibbats Stainton, 'with long dark hair with no whiskers,' notable as a 'most hearty laugher'.<sup>1</sup> Also present are other such well-known entomological figures as the 'sallow-complexioned' J. W. Douglas and the 'excessively droll' Edward Newman.<sup>2</sup> Over the course of this gathering, W. W. Saunders will place before the group a number of illustrations relating to the Lepidoptera of South-East Africa, and J. O. Westwood will deliver a discourse entitled 'Notes on the Wing Veins of Insects'.<sup>3</sup> Westwood will also be attending the meeting of the Linnean Society that takes place the following evening (Tuesday 3rd June), making 'observations on a lepidopterous insect infesting the sugar-canes of the island of Mauritius'.<sup>4</sup> Stainton is yet to be elevated into the ranks of this latter esteemed group, but if you wish to consult him personally on an entomological matter, he is hosting one of his regular 'at home' evenings in Lewisham on Wednesday (4th June). Providing you are over the age of 14, his extensive specimen collections and library will be open to view. Travelling out of central London to the suburbs is made convenient by the North Kent railway line, still less than a decade old. Stainton has helpfully pointed out in the latest issue of the *Entomologist's Weekly Intelligencer* that the trains leave London Bridge at '5.30, 6.0, and 6.45', and return at '9.13, 10.23, and 10.43pm'.<sup>5</sup>

Natural history was a sociable science. The meetings described above are excellent examples of the spaces in which scientific knowledge was circulated during the nineteenth century, through the practice of associating. The tradition of learned societies has a history that can be traced back to the seventeenth century, with roots in Enlightenment ideals and the growth of civil society.<sup>6</sup> Many of these groups, as in the case of the Entomological or Linnean societies (established in 1833 and 1788

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<sup>1</sup> *Entomologist's Weekly Intelligencer*, 1 (1856), p. 65.

<sup>2</sup> *Ibid.*, p. 66 and 106.

<sup>3</sup> *Transactions of the Entomological Society of London*, 4 (new series: 1856-58), pp. 58-64.

<sup>4</sup> *Journal of the Proceedings of the Linnean Society. Zoology*, 1 (1857), p. lv.

<sup>5</sup> *Intelligencer*, 1 (1856), p. 66.

<sup>6</sup> Denise Phillips, 'Academies and Societies', in *A Companion to the History of Science*, ed. by Bernard Lightman (Chichester: John Wiley, 2016), pp. 224-237.

respectively), consisted mostly of gentlemen who would assemble in hired rooms to inform each other of their latest research, via the formal reading of original papers, interspersed with more informal discussion. Stainton's 'at home' evenings, which took place nearly every Wednesday he was in residence at Mountsfield, his house in Lewisham, were by no means unique events. Many entomologists and other men of science opened their doors to visitors in a similar fashion. This was a far less formalised mode of associating, but nevertheless points to the strong links between sociability and science. At the other end of the social spectrum, working men met in pubs to compare and discuss their specimens.<sup>7</sup> From the mid-nineteenth century onwards, societies dedicated to natural history became an increasingly common feature of urban life, which Charles Kingsley described as a new form of 'freemasonry':

These 'Microscopic', 'Naturalist', 'Geological', or other societies, and the 'Field Clubs' for excursions into the country, which are usually connected with them, form a most pleasant and hopeful new feature of English society; bringing together, as they do, almost all ranks, all shades of opinion.<sup>8</sup>

Although previous chapters have focussed on correspondence and periodicals - non-oral means of communication - it should have become apparent that clubs and societies played a prominent role in the scientific practice of even the most shy and retiring entomologists. Almost without exception, Stainton and the individuals previously discussed in this thesis were members of at least one such group dedicated to their interests, where they could enjoy the company and mutual support of like-minded colleagues. Many served as presidents, secretaries, and treasurers. A few even took it upon themselves to establish new societies, when they found their needs were not answered by those already in existence, or if their local area was lacking in such an organisation. Stainton himself was most actively involved with the Entomological Society of London, for which he acted as secretary (1850-51) and president (1881-82). He was elected a Fellow of the Linnean Society in 1859, and was their secretary from 1869 to 1874; became a Fellow of the Royal Society in 1867; was secretary to the biology section of the British Association for the Advancement of Science in 1864, and from 1867 to 1872; and held the post of secretary to the Ray Society from 1861 to 1872.

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<sup>7</sup> Anne Secord, 'Science in the Pub: Artisan Botanists in Early Nineteenth-Century Lancashire', *History of Science*, 32 (1994), 269-315.

<sup>8</sup> Charles Kingsley, *Glaucus; or, the Wonders of the Shore*, 5th edition (London: Macmillan, 1873), pp. 224-225.

An interest in fossilised insects led him to join the Geological Society of London in 1861, though it is not clear how often he attended their meetings. Aside from this, Stainton also found time to be a member of the entomological societies of France, Italy, Stettin, Belgium, and Switzerland (though only in an honorary capacity for the latter two). The London-based societies dictated the rhythm of Stainton's social life as a metropolitan man of science, and as the previous chapter has shown, the *Entomologist's Monthly Magazine* largely owed its existence to conversations that occurred during meetings of London's Entomological Society. Associating was, therefore, a vital practice of natural history. Through meetings, debate, and the display of specimens, an individual's work was made public and began its transit as scientific knowledge.

As James Secord has observed of the eighteenth and first half of the nineteenth century, the 'routes to making public a novel finding were as many and diverse as the range of practitioners in natural philosophy and natural history'. Secord points particularly to the centrality of oral performance in making discoveries known, and thereby claiming precedence.<sup>9</sup> In the period we are concerned with - the second half of the nineteenth century - printed publication came to assume greater significance. However, the relationship between oral and printed forms of communication remained complex, and it would be wrong to draw a neat distinction between the two. The most obvious connection is the publication of periodicals by natural history societies, most commonly in the form of transactions and proceedings. The informal elements of the meetings, such as the debates provoked by the papers read, were not always recorded or reported. This was the case with regards to the Geological Society of London (of which Stainton was elected a member in 1861), who refused to allow these discussions to be made public up until 1868. This was largely a means of controlling how their science was presented to the public, as evidence of disagreement among geologists would not have inspired confidence in the 'facts' (as opposed to abstract theory) that they wished to establish. Furthermore, questions of gentlemanly decorum were at stake, as arguments could often transgress the bounds of civility, and risk bringing the science into disrepute.<sup>10</sup> Published transactions should therefore be seen as more than simply a

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<sup>9</sup> James Secord, 'How Scientific Conversation Became Shop Talk' in *Science in the Marketplace: Nineteenth-Century Sites and Experiences*, ed. by Aileen Fyfe and Bernard Lightman (Chicago: University of Chicago Press, 2007), pp. 23-59 (p. 25).

<sup>10</sup> John C. Thackray (ed.), *To See the Fellows Fight: Eye Witness Accounts of Meetings of the Geological Society of London and its Club, 1822-1868* (Stanford in the Vale: British Society for the History of Science, 2003), pp. v-xii.

record of a society's work, but as an important way in which they represented themselves to a wider audience, and thereby established a distinct identity.

Publishing transactions was a costly endeavour, even for the most eminent and wealthy scientific societies. Aileen Fyfe has shown with regards to the Royal Society that the desire to communicate natural knowledge had to be balanced against the cost of doing so.<sup>11</sup> This chapter does not focus on the publishing endeavours of London learned societies, as there is a growing body of scholarship on this subject relating to the nineteenth century.<sup>12</sup> Instead, it reflects on the much wider range of scientific associational culture in Britain during this period, as distinct from the capital. The learned societies of London were role models for many of these groups, and the decisions made in producing their own periodicals were often framed in accordance or opposition to these leading metropolitan associations. In particular, this chapter will focus on a particular type of organisation that came into being in the second half of the nineteenth century: the natural history 'union', a grouping of natural history societies within a geographically defined area, pooling their resources and circulating knowledge with the aim of advancing natural history at both a local and national level. It will argue that periodicals made such a mode of associational natural history possible, acting as a medium that bound otherwise disparate groups together.

Stainton and entomology are more of a background presence than in previous chapters, as the focus shifts to natural history in a broader sense. Many entomologists would have read and contributed to a wide range of periodicals that were not solely devoted to insects, but rather all branches of the life sciences. Furthermore, outside of London, most entomologists who participated in the practice of association would have done so within a more generalised natural history society. A number of more specialised groups did exist, but these showed a tendency to widen their focus or be subsumed as the century progressed - the South London Entomological Society chose to incorporate 'Natural History' into its title in 1884, and the Haggerstone Entomological Society would likewise evolve into the City of London Entomological and Natural History Society in 1887 (and exists today simply as the London Natural History Society).

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<sup>11</sup> Aileen Fyfe, 'Journals, Learned Societies and Money: Philosophical Transactions, ca. 1750-1900', *Notes and Records*, 69 (2015), 277-299.

<sup>12</sup> Alex Csiszar, 'Broken Pieces of Fact: The Scientific Periodical and the Politics of Search in Nineteenth-Century France and Britain' (unpublished doctoral thesis, Harvard University, 2010); Aileen Fyfe and Noah Moxham, 'Making Public Ahead of Print: Meetings and Publications at the Royal Society, 1752-1892', *Notes and Records*, 70 (2016), 361-379.

Samuel Alberti and Diarmid Finnegan have both produced important work relating to the activities of natural history societies and field clubs in Yorkshire and Scotland respectively.<sup>13</sup> However, both have underplayed the importance of periodicals to the way these groups sought to present their activities within a more broadly conceived concept of a scientific community and, by extension, the greater project of national scientific progress. Periodicals are mobile units, and the publications produced by natural history unions were produced for both local and national audiences. This has significant implications in terms of how the societies and the individuals involved in them chose to present their work. Their motivations were rooted in civic culture, often informed by agendas of urban reform and citizenship, but there were also fundamental questions regarding the role of local natural history societies in doing 'useful' scientific work. Exactly what constituted utility was, of course, debateable. Furthermore, in examining the associational practices of the urban, middle-class milieu in which this mode of natural history took place, it becomes evident that periodicals adopted many of the same communicative conventions. The very successful magazine *Hardwicke's Science-Gossip* demonstrates that conversation was central to participation in natural history, but also highlights differences with the *Intelligencer* and other natural history periodicals from earlier in the century. What emerges is further evidence of the complex negotiations through which diverse practitioners were placed within an emergent hierarchy.

### **'Over Hill and Dale'**

Societies involved in the pursuit of natural history took a variety of forms in the nineteenth century. As already discussed, there were the elite learned societies such as the Linnean (1788-present). Based in the capital, these nevertheless had a national reach in terms of membership and influence. At the local level, groups such as the Leicester Literary and Philosophical Society (1835-present) took an active interest in nature alongside other fields of knowledge. Their membership was predominantly middle class, and open to both men and women. Furthermore, there were societies devoted exclusively to natural history in all its forms, such as the Birmingham Natural History Society (1858-present). Closely related to these were 'field clubs', which focussed more

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<sup>13</sup> Samuel Alberti, 'Amateurs and Professionals in One County: Biology and Natural History in Late Victorian Yorkshire', *Journal of the History of Biology*, 34 (2001), 115-147; Diarmid A. Finnegan, *Natural History Societies and Civic Culture in Victorian Scotland* (London: Pickering & Chatto, 2009).

exclusively on fieldwork and excursions rather than formal meetings. The Woolhope Naturalists' Field Club (1851-present) is perhaps the most renowned of these groups, which seem to have attracted a more diverse membership, certainly in terms of class, if not by gender, though women were increasingly permitted to join as the century progressed. Furthermore, there were a wide variety of more specialist groups that met to discuss a specific branch of natural history, such as entomology or geology. The Haggerston Entomological Society (1858-87) is an excellent example, before it morphed into the London Natural History Society.

There was a marked increase in the number of natural history societies in the second half of the nineteenth century, particularly from the 1860s onwards. Writing in 1858, Stainton remarked upon the growing number of entomological societies, and hoped 'that before long every town which is of sufficient importance to return Members of Parliament will be deemed populous enough to furnish a local Entomological Society', perhaps a sly nod to the debates over electoral representation that would lead to the Second Reform Act of 1867. He was eager to report the proceedings of each of these new societies in the pages of the *Intelligencer* but, as they became more numerous, warned that 'we cannot possibly find room in our columns'. This was occasioned by Stainton's 'simultaneous receipt of two reports' from separate societies, both claiming the title of the York Entomological Society. Mr Hind, treasurer of the original society, had resigned and established a splinter group, though, as Stainton wryly observed, it appears those present at its inaugural meeting were only 'Mr Hind and two friends, one of whom Mr Hind elected member and Secretary, and who then, in this latter capacity, transmitted us a report of Mr Hind's poetical effusions'.<sup>14</sup>

It cannot be dismissed as mere coincidence that this increase in societies coincided with the increase in natural history periodicals. While we should perhaps be wary of drawing any direct causal link between the two phenomena, in a number of cases it is actually possible to do so. The most marked example would be the Quekett Microscopical Club, the establishment of which was orchestrated through *Hardwicke's Science-Gossip*. In May 1865, a very early issue of the newly established magazine published a letter by a W. Gibson, stating that 'some association amongst the amateur microscopists of London is desirable', in order to provide 'facilities for the

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<sup>14</sup> *Intelligencer*, 3 (1857), pp. 193-194. News of Hind's resignation is reported on p. 21.

communication of ideas and the resolution of difficulties'.<sup>15</sup> In the following issue for that August, the formation of the Quekett Microscopical Society was formally announced, with Robert Hardwicke himself acting as treasurer.<sup>16</sup> *Science-Gossip* would later lend its name to the Science Gossip Club of Norwich, founded in 1870, of which the magazine's second editor J. E. Taylor served as president.<sup>17</sup> The Geologists' Association, a group dedicated to self-styled 'amateurs', was founded in 1858 following a letter published in the *Geologist*. S. J. Mackie, editor of that periodical, was involved in their establishment, and was a key influence during their early years before becoming disenchanted.<sup>18</sup> There was, therefore, a direct link between the communities formed through periodicals and the kinds of associations that came into existence during this period. Both served a similar purpose of bringing naturalists together for the dual reasons of sociability and mutual aid - Stainton's 'sympathy of a crowd'. Periodicals made practitioners aware of each other within a locality, much as entomologists discovered new acquaintances on their doorstep through the list in Stainton's *Annual* (see chapter one). Furthermore, periodicals played an increasing role in the organisation of associations, either by bringing a new society into being, or through advertising the activities and recording the proceedings of these groups.

The formation of natural history societies in this period must be considered within the broader context of urban society, with scientific groups being just one of the myriad forms of associational culture. According to Simon Gunn, social clubs reached their heyday between 1870 and 1914, forming 'something akin to a mass bourgeois culture of sociability'.<sup>19</sup> As Samuel Alberti has observed, the field clubs of the 1860s and 1870s were dominated by the middle classes, replacing earlier natural history clubs that had largely been the preserve of working-class men. As a result, 'these new clubs were richer, more mobile, and better documented'.<sup>20</sup> There is a clear correlation between the social make-up of a society and its publication record. The Sheffield Entomological Society, of which the razor grinder James Batty was a member, has left little trace of its

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<sup>15</sup> *Hardwicke's Science-Gossip*, 1 (1865), p. 116.

<sup>16</sup> *Ibid.*, p. 189.

<sup>17</sup> *Report of Proceedings: Science Gossip Club (1874-1903)*.

<sup>18</sup> Eric F. Freeman, 'The Founders of the Geologist's Association II; The Mysterious Mr Mackie', *Proceedings of the Geologists' Association*, 107 (1996), 85-95.

<sup>19</sup> Simon Gunn, *The Public Culture of the Victorian Middle Class* (Manchester: Manchester University Press, 2000), p. 91.

<sup>20</sup> Alberti, 'Amateurs and Professionals', p. 120.

existence other than a few notices in the *Intelligencer* and *Substitute*.<sup>21</sup> Similarly, while the predominantly working-class North, East, and West London Entomological Societies published nothing, the largely middle-class South London Entomological Society issued official reports and proceedings.<sup>22</sup> This can be ascribed to a number of reasons. With the shift in membership towards the middle classes came an attendant shift in ideology, which may go some way to explaining the drive to publish. Anne Rodrick describes how 'between 1850 and 1870, Victorian autodidacticism changed from private aspiration to public duty', with mutual self-improvement becoming closely bound with practices of civic governance.<sup>23</sup> While the working-class members of societies may have been content to expand their own knowledge without feeling a need to broadcast their activity (aside from the obvious difficulties in doing so), the new breed of middle-class naturalist invested the pursuit of science with emergent ideas of citizenship and civic pride. Furthermore, the 'rhetoric of late-century improvement continued to emphasise the necessity of organised and mutual self-improvement rather than purely private reading and thinking'.<sup>24</sup> Science was not something that could or should be done alone, but was something to be pursued as part of a wider community, benefitting all. Diarmid Finnegan has pointed the way with his study of natural history societies in nineteenth-century Scotland, demonstrating how science was presented as a desirable form of civic culture, but also how civic culture was mobilised to support the advancement of science.<sup>25</sup>

David Allen has described the field club as a 'masterpiece of social mechanics'.<sup>26</sup> He attributes the success and proliferation of these clubs to the emphasis placed on excursions, which was an innovative move that set them apart from earlier scientific societies. Rather than having a permanent residence, which required a substantial financial outlay to cover the rent for property, these newly formed groups had no fixed abode. Meetings were held during the summer months, taking place outdoors and often involving active participation in field work amongst their members. The reduced cost of

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<sup>21</sup> *Substitute* (1856-57), p. 2; *Intelligencer*, 4 (1858), p. 44.

<sup>22</sup> *Report of the South London Entomological Society* (1879-83); *Report of the South London Entomological and Natural History Society* (1884); *Abstract of Proceedings of the South London Entomological and Natural History Society* (1885-96); *Proceedings of the South London Entomological and Natural History Society* (1897-1933).

<sup>23</sup> Anne B. Rodrick, *Self-Help and Civic Culture: Citizenship in Victorian Birmingham* (Aldershot: Ashgate, 2004), p. 88.

<sup>24</sup> *Ibid.*, p. 144.

<sup>25</sup> Finnegan, *Natural History Societies*.

<sup>26</sup> David Elliston Allen, *The Naturalist in Britain: A Social History* (London: Allen Lane, 1976), p. 158.

running such a society thereby cut membership fees, allowing for a more inclusive group.<sup>27</sup> Whilst the diverse membership is certainly a feature of some field clubs, it will become apparent that class divisions played a considerable role in determining the structure and activities of these groups.

Writing in the *Intelligencer*, Stainton outlined his opinion of the chief objectives for any natural history society. Firstly, it was simply so 'persons residing in a district with similar tastes may meet and communicate their ideas to each other'. Secondly, to 'hold periodical meetings' at which 'communications from learned members may be read for the benefit of those who are not so far advanced'. Stainton admitted that the society may also wish to form a museum, but advises 'great caution', as 'if it be a bad one it may be of little use'. 'As a rule, a private collection will be in better order, in better preservation, and more instructive than any public collection', and may be made publicly accessible at times convenient to their owner (his own 'at home' evenings being a prime example of such a policy). The third object of a society should be the organisation of excursions or field-days during the summer months, 'when a number of the members meet and ramble over hill and dale, through forest and fen'.<sup>28</sup> Excursions were a key practice of associational natural history during the second half of the nineteenth century, and took an integral role in the activities of most societies.

### **The Reigate Gathering**

The morning of the sixth July  
 A crowd of men came down  
 To Railway Station, London Bridge,  
 And booked for Reigate Town.

The booking clerk was quite amazed  
 That all asked for one place,  
 And wondered if they meant to go  
 To see a fight or race.

He wondered while he took a fare,  
 Though no affair of his,

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<sup>27</sup> *Ibid.*, pp. 159-162.

<sup>28</sup> *Intelligencer*, 1 (1856), pp. 145-146.

And when one whispered 'butterflies',  
He took him for a quiz.<sup>29</sup>

The above lines are taken from a poem written by J. W. Douglas, and published in the *Intelligencer*, commemorating the entomological 'Reigate Gathering' that took place one hot summer day in 1859. The booking clerk at London Bridge station was justified in his bemusement. The town of Reigate, in Surrey, was descended upon by thirty men, Stainton among them, all armed with 'the weapons of the chase / the bottle, box and net'. After first refreshing themselves at a public house - the White Hart - these insect-hunters 'went o'er hill and dale' in search of their quarry, snacking on cheese and slaking their thirst with 'beer, wine and soda water'. Their numbers swelled to fifty over the course of the day, and finally the 'panting multitude' once again returned with 'good cheer' to the White Hart for an evening meal. It had been a disappointing day with regards to the captures made, but it was apparently felt that this was more than compensated for by the 'intercourse of friends'. If Douglas' effusive account is to be believed, this was a highly convivial gathering, untouched by any of the bad feeling or controversy that could often mar the pages of the *Intelligencer* or meetings of the London Entomological Society. Even if it is a somewhat idealised depiction of the outing, there are enough records of similar natural history excursions in this period to verify that the trip to Reigate was a typical instance in most respects. In fact, the number of participants is relatively small compared to some of the grander outings organised by some natural history societies a little later in the century. The poem does much to capture the spirit of such occasions, which were intended to be light-hearted affairs, with the intent being towards fostering a sense of community and goodwill among the participants as much as doing valuable scientific work. No such excursion would be complete without at least one trip to an accommodating local pub, where the excursionists could dine, drink, chatter, make speeches, and occasionally even sing.<sup>30</sup>

It is noteworthy that Douglas focuses particularly on the train journey to Reigate, describing it as a 'vehicle of fun', with 'jokes and mirth at railway pace/still speeding

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<sup>29</sup> *Intelligencer*, 6 (1859-60), p. 122.

<sup>30</sup> For a discussion of sociability and dining in nineteenth-century science, see: Hannah Gay and John W. Gay, 'Brothers in Science: Science and Fraternal Culture in Nineteenth-Century Britain', *History of Science*, 35 (1997), 425-453. Composing and performing natural history-related songs, usually set to popular tunes, was a notable aspect of some Scottish society's field-based meetings. See: Finnegan, *Natural History Societies*, p. 60-61.

bravely on'. The emphasis on swiftness is significant. The development of railway networks at this time was a major factor in enabling such excursions to become a more regular feature of natural history practice. Arranging for such a large group of men to travel together, loaded down with entomological equipment, would have been a far more difficult undertaking without access to (relatively) cheap, efficient, and fast transportation, raising the possibility of making such a trip in a single day. Periodicals enabled such trips to be organised on a larger scale, as the *Intelligencer* frequently posted notices of these outings. An excursion of the Greenwich Entomological Society, led by Stainton in July 1860, was closely planned around the train timetable, and advertised in the *Intelligencer*. It started 'from the Bromley station of the Mid-Kent Railway, at 1.4[0]pm, on the arrival of the train which leaves London Bridge at 12.30 and Lewisham Junction at 12.43'. After exploring Bromley Common 'towards Lock's Bottom', and visiting 'some boggy ground where one of the branches of the Ravensbourne rises', the party would then proceed to Chiselhurst and meet at the 'Tiger's Head' between 4.30 and 5.30pm.<sup>31</sup>

It had therefore become possible to take a relatively comfortable trip outside of the city and into the surrounding countryside for a reasonable price, and be certain of returning home the same day (assuming you avoided missing the last train). Furthermore, this increased interest in nature and field study took place against the backdrop of urbanisation. More people were living in the expanding towns and cities, divorced from nature in a way that their rural, agrarian ancestors had not been. The associational culture that led to the formation of societies was a primarily urban, middle-class phenomenon. Peter Borsay has pointed to natural history societies of the nineteenth century as a way in which a newly urbanised society re-orientated itself towards nature, 'remodelling historical and rural England as its recreational space'.<sup>32</sup> The aristocratic entomologist Lord Walsingham praised such associations, which afforded 'to those who live in towns the much-needed means of becoming acquainted with those delights which are especially associated with country life', adding that such 'delights' were 'too often hidden from many throughout the greater part of their lives by a veil of smoke'.<sup>33</sup>

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<sup>31</sup> *Intelligencer*, 8 (1860), p. 135.

<sup>32</sup> Peter Borsay, 'Nature, the Past and the English Town: A Counter-Cultural History', *Urban History*, 43 (2016), 1-17 (16)

<sup>33</sup> *Naturalist*, 9 (1883-84), p. 218.

The gatherings at Reigate were something of a tradition among London entomologists, organised each year by William Wilson Saunders (1809-79), who resided in the area. A president's address to the Entomological Society of London, made by Frederick Smith in 1862, remarked that 'between sixty to seventy persons availed themselves of his guidance' in June of the preceding year. According to Smith, such gatherings 'may not be of much scientific value', but were nevertheless 'of great service in bringing entomologists together, and giving them opportunities of knowing each other that our more formal and restricted meetings do not afford'.<sup>34</sup> Later in the century, efforts would be made by leading members of some societies to reduce the overtly recreational aspects of such excursions and introduce greater scientific rigour, a key strategy of 'amateurisation' (see previous chapter), but the continued social role of such associational field work cannot be denied.<sup>35</sup> Stainton remarked that those who were shy of attending his 'at homes' in Lewisham 'may perhaps pluck up courage enough to meet one in a lane'. This was confirmed when he organised a 'collecting expedition up Burnt-Ash Lane', beginning 'at 6.30pm, July 30th 1856'. He was very pleased when 'half a dozen old correspondents, whose faces we had never seen, at once responded to the invitation'.<sup>36</sup> It is probable that this was an issue of class, as meeting in the field was a far less intimidating prospect than knocking on the door of a wealthy entomologist's grand residence.

Field clubs and excursions were inherently ephemeral events. A periodical, on the other hand, provided some material evidence of a society's existence. Not every society was capable of publishing such, which is why so many were keen to have notices of their proceedings printed in the *Intelligencer* or other publications. However, an increasing number of groups chose to produce periodicals detailing their activities.

### **'Calling Public Attention'**

The importance of local transactions to the progress of science was widely acknowledged. A bibliographic report in the *Annals and Magazine of Natural History* gives an excellent example of how published societal transactions raised the profile of a group and ensured that their findings reached a much wider audience:

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<sup>34</sup> *Proceedings of the Entomological Society of London* (1862), p. 40.

<sup>35</sup> Alberti, 'Amateurs and Professionals', pp. 133-134.

<sup>36</sup> *Intelligencer*, 6 (1859), p. 81.

Though the Naturalists' Field-Club of Tyneside cannot rank as the first established among the many kindred clubs that now exist in Great Britain, it would yet appear to be winning, if it has not already won, the premier place when estimated by the value of its published Transactions. Other field-clubs may possess a larger number of members, more funds, and even greater popularity; but we know of none that is so carefully carrying out the objects for which it was founded, or whose Transactions contribute more to the progress of natural history than this society of naturalists on the banks of the Tyne.<sup>37</sup>

Newly established societies often stated publication to be among their chief aims. The *Intelligencer* reported on the inaugural meeting of the East Kent Natural History Society, which took place on the 8th April 1858. The gathering was held in the Guildhall Concert Room at Canterbury, the large venue quickly reaching full capacity and leaving many unable to gain admittance. Present were 'many of the clergy and gentry of that division of the county', as well as 'a considerable number of ladies'.<sup>38</sup> Henry Alford, the Dean of Canterbury, was elected president. The membership of the East Kent society seems to have been unusual in a number of respects. The first list of members contains a greater than usual number of women, some alongside their husbands or fathers, others by themselves.<sup>39</sup> The committee aimed to encourage the 'labouring classes' to join by offering free membership and 'rewards to study the beautiful works of creation'. Among its chief aims was to 'collect and diffuse by publication correct data of every interesting fact relating to Natural History that may occur in East Kent'.<sup>40</sup> Furthermore, reports and transactions acted as units of exchange between societies, allowing each group to acquire a more comprehensive reference library. The 1884 report for the East Kent society lists those publications presented by their close neighbours in West Kent and Essex, more distant compatriots from Manchester and Glasgow, and even journals from the Linnaean Society of Bordeaux and the Smithsonian Institution.<sup>41</sup> This suggests that transactions acted as a way of establishing wider networks amongst geographically diverse groups of practitioners.

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<sup>37</sup> *Annals and Magazine of Natural History*, 14 (3rd series, 1864), p. 297.

<sup>38</sup> *Intelligencer*, 4 (1858), p. 33.

<sup>39</sup> *Report of the East Kent Natural History Society*, 1 (1859), pp. 3-8.

<sup>40</sup> *Ibid.*, p. 10.

<sup>41</sup> *Report of the East Kent Natural History Society*, 27 (1884), p. 18.

The Woolhope Naturalists' Field Club came to an agreement in 1866 by which full accounts of its meetings would be published in the *Hereford Times* newspaper, with the type then being 're-set in octavo shape for the *Transactions*'. 'It might seem frivolous, at first sight, to give a more permanent form to the common incidents of our excursions', explained the club's president, but thereby 'papers of much local interest have been preserved, which would otherwise have been lost'. Furthermore, the 'full publication of all our proceedings and papers has moreover proved a most successful means of calling public attention to the objects for which the Woolhope Club was formed', that being the 'spreading more widely an interest in the natural productions of our county' and 'actively promoting the study of natural science in the district'. Finally, the reports of the club's field days 'make people wish they had been with us'.<sup>42</sup> This demonstrates the degree to which the club wished its activities to be made public, a key aspect of middle-class urban culture. Publishing in the leading local newspaper brought it before a wider public and established the club as a constitutive part of the town's civic culture. The Woolhope Club would eventually achieve the ultimate expression of this through the Hereford library. Built in 1873 with the patronage of a wealthy member, it served the dual purpose of public library to the city and meeting place for the club. Decorated with natural history gargoyles, and continuing to serve as Hereford's primary library, museum, and art gallery - in addition to hosting the club's continued meetings - it stands as a lasting testament to the ways in which the pursuit of natural history and urban reform could become entangled.

### **Extending Usefulness**

In early April 1864, just as plans for the *Entomologist's Monthly Magazine* were gathering pace, Stainton received a letter from George H. Parke of Huddersfield, 'announcing the formation of a successor to the *Entomologist's Weekly Intelligencer* and the *Weekly Entomologist*'. Parke requested that Stainton could be advertised as 'an occasional contributor' to this new, northern-based periodical, as this would be likely to ensure increased interest amongst former readers of the *Intelligencer*.<sup>43</sup> Given Stainton's commitment to the *Monthly Magazine*, he politely declined. A few days later, Thomas Blackburn was also approached by another Huddersfield man, George Tindall,

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<sup>42</sup> *Transactions of the Woolhope Naturalists' Field Club* (1866), p. 148.

<sup>43</sup> George H. Park to H. T. Stainton, 5th April 1864, London, Natural History Museum, H. T. Stainton Correspondence from British Entomologists (MSS STA E 118:118), STAINT 80:118.

regarding the same subject. Tindall asked Blackburn to 'use your influence with the contributors of your former paper and obtain for me their support', clearly unaware that the erstwhile proprietor of the *Weekly Entomologist* had other ideas.<sup>44</sup> This was almost exactly the same time that Stainton and his fellow editors of the *Entomologist's Monthly Magazine* learnt of Edward Newman's plans for the *Entomologist*, so news of another rival periodical could hardly have been welcome. 'I fear it would be inadvisable for two papers to come out together', said Blackburn, but he had 'little doubt that we shall be the conquerors'. This supposed challenger commenced in May, entitled the *Naturalist*, or the *Journal of the West-Riding Consolidated Naturalists' Society and Manual of Exchange in all Departments of Natural History*.<sup>45</sup>

Despite the *Naturalist's* wider focus on all aspects of nature, the opening address made it clear that its editors conceived of the journal as a direct heir to the entomological periodicals of Stainton and Blackburn:

The demise of the *Weekly Entomologist* left a gap in entomological literature which was keenly felt by the working student in that science; the facilities for making exchanges which were afforded through the columns of that periodical, as well as of its predecessor the *Entomologist's Intelligencer*[,] brought collectors into correspondence with each other, and their collections were at once enriched with species which would have taken years to obtain had no such means of communication existed. The capture of rare species was at once made known, and love for inter-communication among entomologists, and especially among *young* students of that science, was fostered and encouraged.<sup>46</sup>

The initial aims of the *Naturalist* were therefore very similar to those of the *Intelligencer*. Although the periodical was open to all branches of natural history, a report by the Botanical Society of Edinburgh shows that self-identified lepidopterists were the most numerous element of the West-Riding Consolidated Naturalists' Society, with botanists and ornithologists respectively a close second and third.<sup>47</sup> This explains

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<sup>44</sup> Thomas Blackburn to H. T. Stainton, 7th April 1864, STAINT 11:118.

<sup>45</sup> Not to be confused with the *Naturalist* (1851-58), edited by Francis Orpen Morris. The two periodicals are unrelated.

<sup>46</sup> *Naturalist*, 1 (1864-65), p.1.

<sup>47</sup> *Transactions of the Botanical Society of Edinburgh*, 11 (1873), pp. 235-236.

the desire to emulate the *Intelligencer* in the form of their own periodical, and demonstrates the lasting legacy of Stainton's weekly publication.

The *Naturalist's* opening address also discussed the recent increase in natural history societies:

There is scarcely a town in the Kingdom, and in the North of England scarcely a village, in which some such society, either 'Botanical', or 'Entomological', or 'Naturalist' does not exist, whilst 'Field Clubs' are continually exploring every portion of the country. The West-Riding Consolidated Naturalists' Society alone, comprising six societies within an area of twenty miles, numbers upwards of 200 members; the Northern Entomological Society (Liverpool) about the same number; and it would not be too much to affirm that in Yorkshire and Lancashire alone, 2,000 students of nature are banded together in societies of this kind. It is our earnest wish that the *Naturalist* may be the means of binding them still more firmly together, and making them better known to each other and to their brethren in more distant parts of the country, and of increasing their zeal and love of natural science.<sup>48</sup>

The West-Riding Consolidated Naturalists' Society would eventually become the Yorkshire Naturalists' Union, and it was the first such conglomerate of natural history societies. The *Naturalist* would go through a number of different iterations, varying to some degree as the proprietors and editors changed, but ultimately it remained a journal with two primary aims: to act as a means of intercommunication between the various constituent groups of the Union, and to record and circulate the natural history of northern England. This is a further illustration of how periodicals shaped new ways of organising science in this period, functioning at both a local and national level. The publication served to bind the localised groups together, giving them a sense of cohesion and shared identity in much the same way other natural history periodicals brought together localised practitioners. Additionally, it served as an interface through which the Yorkshire naturalists could communicate with their 'brethren' throughout the country, incorporating them into an even more broadly conceived scientific project. The

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<sup>48</sup> *Naturalist*, 1 (1864-65), p.1-2

periodical was therefore an integral part of the Union's existence, and both the organisation and the *Naturalist* continue to the present.

The example of the Yorkshire naturalists was followed in turn by the Midland Union of Natural History Societies, which formed in 1876. The 'Midlands', in this case, was very loosely defined, stretching into Wales and as far south as Oxford and London. At the very first meeting of the group's council, one of the ten resolutions passed stated, 'that a monthly magazine to be called the *Midland Naturalist*, be issued by the Union', with the appropriately named Edward W. Badger of Birmingham and William J. Harrison of Leicester appointed as editors.<sup>49</sup> Badger was a proprietor of the *Birmingham Herald* newspaper, the offices of which served as headquarters for the Union's periodical, and seems to have taken care of the printing and publishing side of business rather than the science. Harrison, on the other hand, was the curator of the Leicester Town Museum, as well as a respected writer on geology and photography.

The principal objects of the Midland Union were stated as follows:

To extend the usefulness of local societies by affording facilities for the inter-communication through an authorised and regularly published magazine, which shall record the more important work done by them; announce their forthcoming meetings; and assist in the interchange of notes and specimens; and, by providing opportunities for personal intercourse among the members at meetings to be held from time to time in various places of interest, and in other ways, to promote the study of natural history, especially that of the midland district.<sup>50</sup>

It is notable that the primary aim of the organisation is the publication of a periodical, which the members hoped would extend the 'usefulness' of their activities. This concept of 'usefulness' is repeatedly invoked in many such society periodicals, closely linked to the circulation of knowledge:

At present, whenever a good paper is read before one of our local societies its usefulness is too often limited to the members of that society, and generally to that part of them who chance to hear it read. By printing such

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<sup>49</sup> *Midland Naturalist*, 1 (1878), p. 2.

<sup>50</sup> *Ibid.*

papers, or abstracts of them, in this magazine, their usefulness will be widely extended, and all the Societies may benefit by them.<sup>51</sup>

As with the Yorkshire Union, the Midland Union's founders conceived of its function at both a local and national scale, with the periodical mediating between these two levels. The work of natural history societies only became 'useful' if it was circulated more widely, rather than limited to its immediate context.

The *Midland Naturalist* commenced in 1878, and ran continuously until 1893. In the report of the Midland Union's second annual meeting, held in Leicester, the total membership of the combined group was estimated at 3,000, though it was noted with disappointment that only around a sixth of these subscribed to the *Midland Naturalist*.<sup>52</sup> It is of course quite possible, however, that if a single copy was acquired by a society's communal library, it could then have been read by multiple individuals. By 1880, the circulation among the 'outside public' was continuing to grow, even if the Union's own members continued to be recalcitrant.<sup>53</sup> After reaching 16 volumes, it was decided to discontinue the periodical, having 'failed to find sufficient support to justify its longer continuance'.<sup>54</sup> Unlike the *Naturalist*, which could draw on a common Yorkshire identity to bind together its constituent members, the *Midland Naturalist* faced a much harder task of reaching across counties, drawing together a range of clubs and societies that sat together less easily than their northern counterparts. Other than a single annual meeting, the periodical was the sole embodiment of the Midland Union and its activities.

### **'Private Soldiers Acting in Concert'**

The periodicals of many natural history societies played a role in constructing a very specific kind of community, and one that enforced a much stricter hierarchy than the popular publications of earlier in the century. The opening address of the *Naturalist* makes it clear that although science could be undertaken by anyone, this must be carried out through strict organisation and under the auspices of recognised leaders.

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<sup>51</sup> *Ibid.*, p. 4.

<sup>52</sup> *Midland Naturalist*, 2 (1879), pp. 168-169.

<sup>53</sup> *Midland Naturalist*, 3 (1880), p. 150.

<sup>54</sup> *Midland Naturalist*, 16 (1893), preface.

There are two classes of men who more than all others have ever laboured hard and steadfast, in order to secure the moral improvement and social and individual happiness of mankind - clergymen and physicians - and they perhaps more than all others, have been ardent admirers and untiring investigators of Natural History. [...] It is however a cheering feature of the present day that, though such men act as generals in this wide field, there is a large army of private soldiers acting in concert, and co-operating with the plans and purposes of their honourable commanders.<sup>55</sup>

This is a community still based on an ideology of participation in the circulation of scientific knowledge, but the terms on which this takes place are now conceived of within a rigid hierarchy. This conception of rank is far less evident in earlier periodicals such as the *Intelligencer* or *Zoologist*, which invited contributions from anyone, valuing the intensely localised knowledge of many individuals regardless of status. Men such as Stainton were considered as leaders in their particular field, but not 'generals' in command of a military-style force of naturalists. In the *Naturalist*, however, men whose rank is afforded by their position in society, rather than their scientific expertise, are placed in a position of power and responsibility, charged with orchestrating the activities of local societies.

The strong middle-class influence on this new associational culture of natural history is clear when you observe who stepped into the leadership roles of these societies. The Huddersfield Naturalists' Society was originally composed mostly of working men, but rose to prominence as the middle classes became increasingly involved. It is significant that Huddersfield had a higher proportion of middle-class inhabitants compared to the other northern textile towns - mostly merchants and manufacturers - and Hilary Marland has pointed to the unusually high proportion of households employing female domestic servants by 1872 as an indicator of this.<sup>56</sup> Naturally, this had an attendant effect upon the civic life of the town, and it is perhaps not coincidental that Huddersfield formed the hub of what became the West-Riding Naturalists' Union. The middle classes brought their own forms of organisation to the study of natural history, establishing committees and running the societies in a more business-like way.

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<sup>55</sup> *Naturalist*, 1 (1864), p. 4.

<sup>56</sup> Hilary Marland, *Medicine and Society in Wakefield and Huddersfield, 1780-1870* (Cambridge: Cambridge University Press, 1987), p. 23.

Charles Hobkirk (1837-1902) was a Huddersfield banker, rising to the rank of branch manager by 1884, and in many ways is an exemplar of the middle-class naturalists who formed the leadership of so many provincial natural history societies of this period. He served as president of the Huddersfield Naturalists' Society for several terms of office, and was one of the 'leading spirits' of the Yorkshire Naturalists' Union from its inception. Although Hobkirk showed a 'catholicity of taste' when it came to natural history, his especial expertise was in bryology, the study of mosses, on which he published a number of important works.<sup>57</sup> He was elected a Fellow of the Linnean Society in 1878, though this was far from a unique achievement among the leading members of most provincial natural history societies. At Hobkirk's funeral, representatives of the Union laid a wreath of reindeer moss upon his grave. His obituary in the *Naturalist* remembered Hobkirk as an 'indispensible member' of the Union, praising his 'geniality, urbanity, thorough grasp of business, and full appreciation of every scientific aspect'.<sup>58</sup> The reference to his astute sense of business is significant, as it demonstrates exactly the skills that were required to make a success of such an undertaking as a natural history society, particularly one on such a grand scale as the Yorkshire Naturalists' Union. It is clear why men such as Hobkirk assumed the leadership of such groups, as their (non-scientific) professions equipped them with necessary experience and abilities to fulfil the task successfully. Hobkirk was almost certainly involved with the establishment of the first incarnation of the *Naturalist* in 1864, given its close association with Huddersfield, though the editorship was kept anonymous for the initial three volumes up to 1867. Subsequently, he and his close friend George Porritt (a prominent Huddersfield wool merchant and entomologist) were the named editors of the second attempt, begun in 1875, and jointly held this position until 1884.

In his early twenties, Hobkirk had published a book entitled *Huddersfield: Its History and Natural History* (1859). This was rewritten and considerably expanded for a second edition in 1868, sharing its London and Huddersfield publishers with that of the *Naturalist*. It combined an exhaustive account of Huddersfield, both past and present, along with an equally comprehensive survey of the flora, fauna, and geology of the town's environs. Rosemary Sweet has shown how the writing of urban histories in the eighteenth century was an expression of civic pride and identity, and Hobkirk's book is

<sup>57</sup> *Proceedings of the Linnean Society of London*, 115 (1902-03), pp. 30-31.

<sup>58</sup> *Naturalist*, 28 (1903), pp. 106-108.

very much following in this tradition.<sup>59</sup> Hobkirk's agenda can be inferred on the very first page, which describes Huddersfield as 'one of the prettiest and cleanest manufacturing towns in the West-Riding'.<sup>60</sup> The inclusion of natural history adds an additional dimension to this, demonstrating that the natural as well as the manmade elements of the area are worthy of close study, and a further expression of regional identity. When considered alongside the *Naturalist*, the book and the periodical can both be considered as indicative of a self-fashioning of regional identity among provincial men of science, emphasising what is unique and of interest within the West-Riding region. The *Naturalist*, however, was part of a wider project, a hope that the local exertions of men such as Hobkirk and his fellow Yorkshiremen would contribute to a comprehensive survey of the whole of Britain, and their example was followed by the midland counties.

### **A 'Full and Useful Occupation'**

The first meeting of the Midland Union of Natural History Societies was held in Birmingham in 1878. The gathering was accommodated in the Midland and Birmingham Institute, built in 1854 for 'the Diffusion and Advancement of Science, Literature and Art amongst all Classes of Persons resident in Birmingham and the Midland Counties', once again placing the pursuit of natural history within a much broader context of civic culture. Edmund Tonks, the first president of the Midland Union, was a barrister and owner of a brass foundry, claiming in his inaugural address to be 'versed in no department of Science or Philosophy'. His 'accidental qualification' for this high office was through his role as president of the Birmingham Natural History and Microscopical Society, which played a leading part in establishing the Midland Union.<sup>61</sup> In addition to this role, he had previously served on a committee for the establishment of Birmingham's Shakespeare Memorial Library in 1868, and a committee for inquiry into the city's sewage system in 1871.<sup>62</sup> He was, therefore, an established figure in Birmingham's civic life, devoting his energies to improving schemes. Likewise, the secretary to the Midland Union was Lawson Tait, both a leading

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<sup>59</sup> Rosemary Sweet, *The Writing of Urban Histories in Eighteenth-Century England* (Oxford: Clarendon Press, 1997).

<sup>60</sup> C. P. Hobkirk, *Huddersfield: Its History and Natural History* (Huddersfield/London: George Tindall/Simpkin, Marshall, & Co, 1868), p. 1.

<sup>61</sup> *Midland Naturalist*, 1 (1878), p. 169.

<sup>62</sup> John Alfred Langford, *The Birmingham Free Libraries, the Shakespeare Memorial Library, and the Art Gallery* (Birmingham: Hall & English, 1871), p. 53; *The Engineer*, 32 (1871), p. 329.

surgeon and a councillor for the Borough of Birmingham, also serving on the Health Committee and the subcommittee for 'Interception and Night Soil'.<sup>63</sup> Tonks and Tait's engagement with natural history could be considered as incidental to their involvement with urban reform, but this would deny the significance of science as an important strand to their civic agendas.

Many nineteenth-century men of science took an active role in politics and local government. Stainton was a loyal Liberal and involved himself in various civic schemes in his native Lewisham, but there is very little evidence of this in any of his scientific work. What makes it worth remarking upon in the case of the Midland Union is the ways in which the association presented natural history as an important form of urban culture. The *Midland Naturalist* played a crucial role in promoting this, as it was the primary medium through which the union could present itself as a useful scientific organisation, articulating a sense of shared identity among what was otherwise a diffuse agglomeration of practitioners. Tonks' inaugural address to the Midland Naturalists' Union reflected his civic-minded interest in public health, as he sought to guide the combined efforts of the societies under his presidency. The first problem he identified was entomological - 'what is it that determines the sexes of bees?' - a question that falls within the more usual scope of natural history (and would, no doubt, have been approved of by Stainton). However, Tonks then proceeded to urge his listeners to devote their energies to the 'study of that strange class of organisms, the parasites of man'. As Tonks observed, the *Midland Naturalist* was currently publishing the research of the Birmingham Natural History Society's vice-president, Dr Spencer Cobbold, who was a leading expert on these 'human plagues'. Tonks wished others to take up the study, as this was a 'full and useful occupation for such of you as have the necessary patience and application'. Despite the unsavoury nature of the subject, far removed from the more wholesome pursuit of excursions into nature, close attention to these creatures revealed 'metamorphoses more strange and bewildering than any we have read of in the fabulous pages of an Eastern tale'. The 'life-career of a simple cestode worm' was more 'full of marvel' than anything in the *Thousand-and-One Nights*. More importantly, by tracing the life-cycle of these 'formidable guests', the researcher would gain the 'proud distinction of having conferred a benefit on mankind', acquiring knowledge that would allow their unwilling hosts to 'guard effectively against their unwelcome visits'.

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<sup>63</sup> E. R. Kelly (ed.), *The Post Office Directory of Birmingham, with its Suburbs, for 1878* (London: Kelly and Co., 1878), pp. 585-587.

Throughout this speech, Tonks repeatedly invoked the 'utility' of such a study, while also emphasising the 'absorbing interest' it would provide to the diligent worker.<sup>64</sup>

The work advocated by Tonks seems a far cry from the less obviously 'useful' work of the lepidopterists who have featured in previous chapters, but it serves to illustrate the place natural history could take on within civic culture, and the ways in which it could be appropriated and reshaped to serve different ends. Tonks went on to suggest that further attention be paid to the bacteria that causes 'many fatal diseases' such as scarlet fever, measles, and smallpox. This utilitarian strain is perpetuated in the addresses of subsequent presidents. A few years later, at the annual meeting held in Northampton, Sir Hereward Wake (a baronet and 'especially a student of entomology') suggested that 'a new fact concerning the economy of some well-known insect, whether that insect be reckoned among our friends or foes', was of 'far more importance' than any 'record of the rarest and least known species in any particular locality'. Likewise, discovering a means to destroy the 'eggs and larvae of some common garden pest', was more 'useful' and a greater 'triumph' than the capture of 'some rare moth or butterfly'. Like Stainton, he urged those who were apt to be 'led away by the fascinations of collecting' to take up a less superficial examination of insects, though Wake's emphasis on 'economic' entomology - largely concerned with 'pest' species - far exceeded that of his London-based counterpart.<sup>65</sup> It seems that provincial natural history societies felt a far greater need to stress the practical applications of their work, and that this drive for 'usefulness' was directly linked to the production of periodicals. The fruits of any society's research could not be of use to anyone if not presented before a wider public via the medium of print.

It was in the field of geology where Tonks felt the unique strengths of the Union would prove particularly effective. A systematically organised survey of the region, with sub-sections each 'bringing to bear its united local knowledge, could carry the work into effect with a completeness scarcely attainable in other ways'. Tonks hoped that the midland counties could lead the way in this, inspiring the rest of the country to follow suit, thereby producing a national geological map that 'could only be produced by the well-ordered work of an army of enthusiasts'. Once again, military-style organisation is the model on which to proceed. Following Tonks' suggestion, William

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<sup>64</sup> *Midland Naturalist*, 1 (1878), pp. 169-177.

<sup>65</sup> *Midland Naturalist*, 3 (1880), p. 152.

Harrison proposed through the *Midland Naturalist* that an examination of glacial deposits within the midland counties could be undertaken by dedicated workers from each of the member groups, reporting their findings via the periodical. Harrison believed that 'no very special training is needed', as 'everybody knows the appearance of a lump of chalk and a piece of flint'. Likewise, specialist equipment was not a necessity either, much beyond a geological hammer, though Harrison observed that 'I have known a working man with a coal-pick do excellent work'. It was his hope that such an endeavour could answer a number of geological conundrums, and perhaps even touch upon the 'origin of man' by discovering evidence of the counties' pre-historic inhabitants.<sup>66</sup> This was a concerted effort by Harrison to use the *Midland Naturalist* in order to marshal the otherwise diffuse efforts of the association's constituent groups, with the periodical acting as the medium of communication between societies. It points to the importance of local knowledge in solving much larger scientific questions, but this could only be done if that knowledge was circulated.

Tonks was determined that the Midland Union's outlook should not be purely parochial, and points to periodicals as the key to ensuring this:

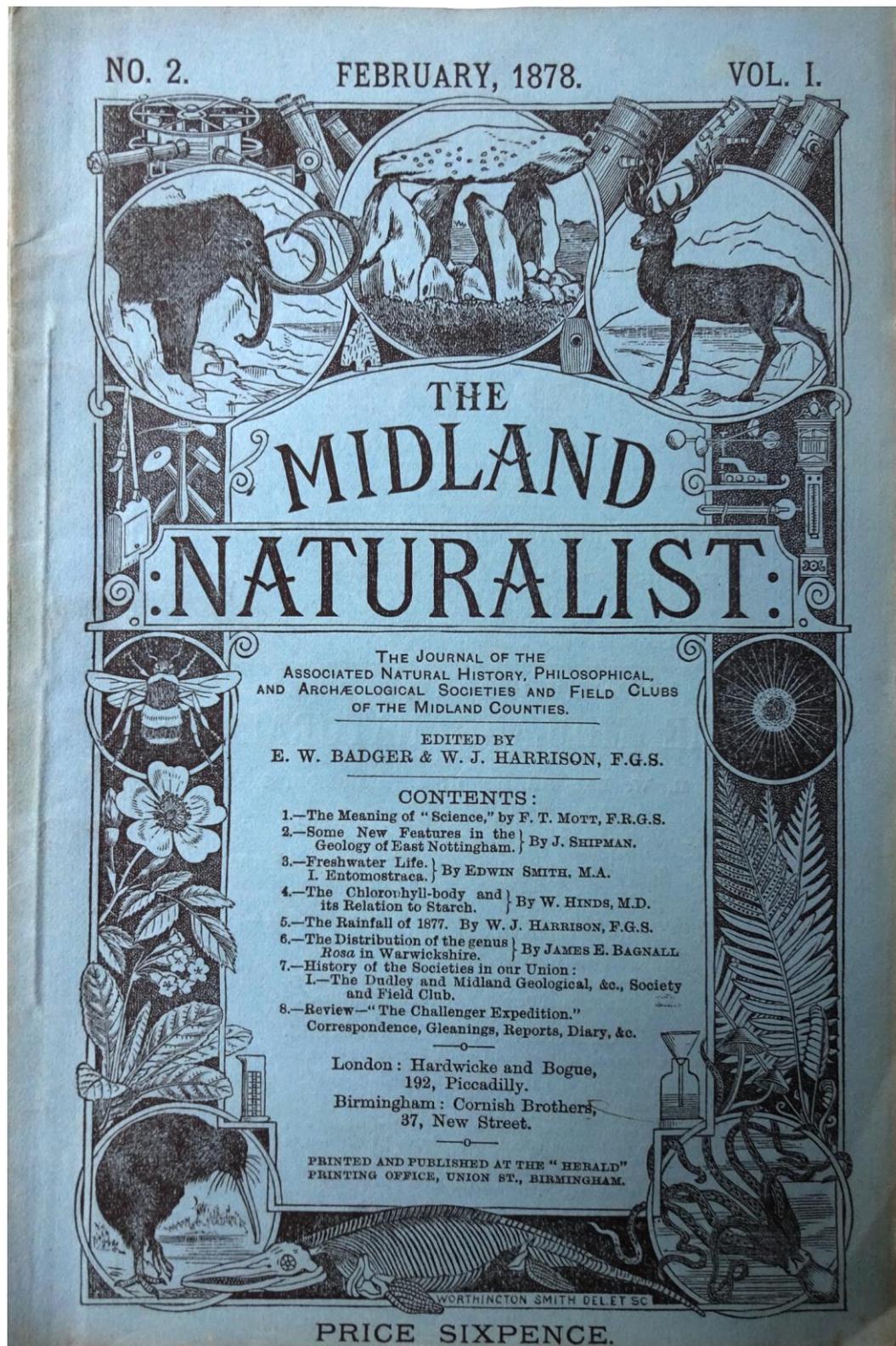
We are British as well as Midland Naturalists, and ought by all means in our power to aid in extending the usefulness of those representative Societies of our country, of world-wide reputation, whose reports, transactions, and other publications, form in a great part the basis of the knowledge we possess of the various subjects of our studies.

The societies that Tonks refers to here are the leading, London-based groups such as the Linnean, Entomological, Zoological and Geological societies. Tonks acknowledges that publications are costly, and concludes that:

It is the duty of every true naturalist, who can afford the few guineas necessary to constitute membership, to join these Societies and aid the general cause of science by increasing their means of utility.

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<sup>66</sup> *Midland Naturalist*, 1 (1878), pp. 242-245.



**Figure 4.1** *Midland Naturalist*, 1, no. 2 (February 1878), front cover. The design, by illustrator and mycologist Worthington George Smith (1837-1917), represents all the branches of science pursued by the Midland Union. This ranges from natural history subjects such as entomology and botany (the bee on the left, and the plants on either side), to archaeology (the stone cromlech, top centre).

Tonks directly equates publication, particularly in the form of periodical transactions, with the utility of any scientific association. Therefore, he considered the *Midland Naturalist* (fig. 4.1) as the 'first work of, and sufficient reason for' the Union.<sup>67</sup>

Dr Spencer Cobbold, the expert on human parasites referred to by Tonks above, was the first respondent to the inaugural president's address. He compared the Midlands Naturalists' Union to the British Association for the Advancement of Science - both having a similarly peripatetic existence - but Cobbold suggests that the latter is a misnomer, and would be better entitled the 'British Association for the Diffusion of Science'. The Midlands Union, on the other hand, 'would really prove a greater vehicle [than the BAAS] for the advancement of science' by making its members 'actual workers in the cause of science'. By encouraging 'local talent', individuals 'who had hitherto not had the opportunities' could thereby become 'untiring students' in 'some department of Natural History'.<sup>68</sup> This distinction is key to how many scientific societies regarded themselves. Rather than simply 'diffusing' or dictating knowledge to a passive audience, their aim was to recruit useful practitioners who could make a valuable contribution both to science and society. To this end, the *Midland Naturalist* was a medium of 'inter-communication', inviting active participation.

### **Citizen Science**

Although the claims to utility are common among the addresses of presidents to natural history societies, there were also many attempts to promote the less tangible benefits of studying nature. The Midland Union, and the *Midland Naturalist*, cannot be divorced from the urban context of their inception. The primary force behind the Union's formation was the Birmingham Natural History and Microscopical Society, who hosted the first annual meeting in 1877. The society and its members continued to play a leading role in the Union, and at times it was their core members who contributed the bulk of material to the periodical. This is significant as the 'civic gospel' of Birmingham had reached its apogee during the mayoralty of Joseph Chamberlain from 1873-76, and the city would earn a reputation as the best-governed in the world during the 1870s and 80s.<sup>69</sup> George Dawson, the nonconformist preacher who had originally espoused the

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<sup>67</sup> Ibid., p. 177.

<sup>68</sup> Ibid., p. 177-178.

<sup>69</sup> Asa Briggs, *Victorian Cities* (New York: Harper & Row, 1965), pp. 184-240. Briggs' account remains some of the best scholarship on the civic gospel in the 1870s-80s.

primary tenets of the civic gospel, had employed the very language of natural history to convey his claim that 'a town is a solemn organism through which shall flow, and in which shall be shaped, all the highest, loftiest, and truest ends of man's moral nature'.<sup>70</sup> Some of the civic gospel's leading proponents were members of the Birmingham Natural History Society, including Alderman Thomas Avery, Samuel Timmins, and Richard Chamberlain (brother to Joseph Chamberlain).<sup>71</sup> Even if they did not regularly attend meetings, their willingness to support such an institution demonstrates its place within civic life, as well as situating the society within an urban, middle class, and liberal milieu. A more detailed study could be written regarding natural history within the context of civic governance and urban reform during this period, with Birmingham in particular providing ample evidence for a strong link, but this is beyond the scope of this chapter. However, it cannot be denied that the rhetoric apparent in the formation of the Midland Union, and the forms of natural history represented in the *Midland Naturalist*, must be considered as forming part of a wider middle-class culture that wished to promote the welfare of a city's inhabitants through improvements to education and public health.

'The "civic gospel" was a true gospel', according to Asa Briggs, as the 'ideals which lay behind it were greater than the men who brought it into being'.<sup>72</sup> Much the same could be claimed of the Midland Union of Natural History Societies, which was founded on similarly lofty principles. Ultimately, the aim behind the attempts made by societies to increase participation in natural history, at least according to their own rhetoric, was the creation of a scientific community that embraced the whole population. For Edmund Badger, speaking as president of the Birmingham Natural History Society in 1881,

All societies, whether they be Royal, Linnean, or such as consist only of a few intelligent operatives in some little country town [...] are aiding in the good work of opening eyes and awakening minds to what lies so near to them.<sup>73</sup>

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<sup>70</sup> Quoted in: Briggs, *Victorian Cities*, p. 196.

<sup>71</sup> *Report and Transactions* [of the Birmingham Natural History and Microscopical Society] for the year 1881, pp. xxxiv-xliii.

<sup>72</sup> Briggs, *Victorian Cities*, p. 197.

<sup>73</sup> *Report and Transactions* [of the Birmingham Natural History and Microscopical Society] for the year 1881, p. vii.

A society should afford the opportunity for those 'in all ranks of life to meet together on a common platform'. This wish reflects the civic ideology of Birmingham, which sought to transcend the boundaries of class and make provision for '*all* our people'. Furthermore, the pursuit of natural history was seen to inculcate characteristics and virtues that were desirable in a model citizen, promoting both physical and spiritual health. Badger continued:

The effect of natural history studies [...] is to invigorate the powers of the mind, and especially to strengthen the habits of accurate observation and painstaking, which cannot be limited in their uses to these leisure-time studies, but will extend with great advantage to the daily working duties of the student in the ordinary affairs of life.<sup>74</sup>

The civic-minded leaders of natural history societies thereby aimed to place their activities within a larger narrative of providing healthful and rational recreation to the working classes. Educational reforms and the establishment of free libraries were championed by many of the very same individuals who advocated natural history, such as Edmund Tonks, and it is clear that this was not coincidental.

The *Midland Naturalist* was itself conceived as part of this plan to encourage active participation in natural history among the population of the midland counties, providing a forum by which correspondents could circulate observations and advertise exchanges. We should, of course, be wary of suggesting that such high ideals translated directly into practice. The continued appeals for individual members of the Union to purchase the *Midland Naturalist* were a regular feature of president's addresses for the entirety of its existence, suggesting that it was only partially successful, though there is evidence that sales among the general public were far healthier. According to the wrapper of the second number, 1,600 copies were printed of the first, 1,500 of which had been sold by that point. Many of these were acquired through booksellers 'to purchasers not members of the Societies in our Union', demonstrating a more widespread appetite for natural history.<sup>75</sup> It also suggests that the periodical was purchased outside of the Midlands, though it is not possible to ascertain to what extent this occurred.

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<sup>74</sup> Ibid., p. vii.

<sup>75</sup> *Midland Naturalist*, no. 2 (February 1878), wrappers (from author's own collection).

### The Darwin Medal

In 1880, the Midland Union's most famous member - Charles Darwin himself - gave his blessing for a newly instituted award to bear his name. The purpose of the Darwin Medal was the 'encouragement and reward of original research by local Geologists, Naturalists, and Archaeologists', acting as an 'incentive to much real and useful work'. Each year, the prize was awarded to a paper 'indicating original research within the scope of the Societies in the Union, contributed by a member for publication in the Journal of the Union [the *Midland Naturalist*]'. At least, that was the plan. In reality, certain years would pass without the medal being awarded, as the judges reserved the right to withhold the prize if no contributions of 'sufficient merit' were received.<sup>76</sup> However, the winners of the Darwin Medal present a cross-section of the scientific community represented by the *Midland Naturalist*, and offer an instructive way to consider the changes occurring in the life sciences in this period.

The 1882 recipients of the Darwin Medal were Professor Arthur Milnes Marshall (1852-93) and William Prime Marshall, who were presumably related. The former held his academic position in zoology at Owens College, Manchester, and the latter was a civil engineer. Their paper, 'A Report on the Pennatulida', accounted for around a quarter of the *Midland Naturalist* for that year, and is a detailed analysis of coral collected on a 'dredging excursion' to Oban, Scotland, made by the Birmingham Natural History and Microscopical Society.<sup>77</sup> It is likely that Arthur Milnes Marshall undertook examination of the coral specimens, and wrote the bulk of the report, and W. P. Marshall was responsible for the technical illustrations (his name appended to each). Diarmid Finnegan has described how dredging - that is, gathering specimens from the sea floor with a large net lowered from a boat - combined both the recreational and social elements of natural history societies with more serious scientific work. Women were often encouraged to take part, joining a team that largely consisted of non-expert society members who acted as workers to be directed by a select few established men of science.<sup>78</sup> A. M. Marshall was a talented young embryologist, trained at Cambridge, and in 1879 had been appointed Professor of Zoology in a newly established post at Owens College in Manchester. He would later be elected a Fellow of the Royal Society in

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<sup>76</sup> *Midland Naturalist*, 3 (1880), pp. 181-182.

<sup>77</sup> *Midland Naturalist*, 5 (1882), p. 55.

<sup>78</sup> Finnegan, *Natural History Societies*, pp. 56-59.

1885, and seemed destined for further acclaim before he was tragically killed in a mountaineering accident. Alison Kraft and Samuel Alberti have written on Professor Marshall's dedication to Huxleyean, laboratory-based biology, and his instrumental role in establishing this mode of research and teaching in Manchester. Significantly, he was among those who aimed to construct a distinct professional identity for biologists.<sup>79</sup> His decision to work with non-professional practitioners of natural history, and to publish in a local natural history periodical, may seem strange when considered in this light. However, Samuel Alberti has also pointed to the continued interaction between amateurs and professionals in Yorkshire, who undertook various projects in collaboration.<sup>80</sup> The *Midland Naturalist* demonstrates that such work was also occurring further south, but more significantly, the efforts of the non-professionals who collected the specimens are rendered almost invisible by Marshall's published work, aside from the acknowledgment in the paper's title. The 'army' of workers who contributed to Marshall's medal are consigned to a subordinate role, in support of a new breed of professionals.

By contrast, the 1888 winner of the Darwin medal was James Eustace Bagnall (1830-1918), who seems to be something of a throwback. The preface to his *Flora of Warwickshire*, published in 1891, stated that all of his scientific work had 'been done in the scant leisure of a manufactory clerk', and all his knowledge of botany was 'self-acquired'. Rather than a laboratory-based biologist, Bagnall embodied a continuation of the naturalist tradition, collecting and identifying specimens, and compiling a systematic survey of his locality. Once again, the *Flora* emphasises the close connection between local science and civic culture, as among Bagnall's patrons were Joseph Chamberlain and a host of other leading Birmingham men. There is also a strong link to the *Midland Naturalist*, as much of the material was originally published in that periodical, and Edward Badger was closely involved in bringing the book to print.<sup>81</sup> The periodical therefore continued to serve as a way for those such as Bagnall to participate in natural history, and points to the coexistence of both older and newer approaches to the study of the life sciences within associational practice.

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<sup>79</sup> Alison Kraft and Samuel Alberti, 'Equal Though Different': Laboratories, Museums, and the Institutional Development of Biology in Late-Victorian Northern England', *Studies in History and Philosophy of Biological and Biomedical Sciences*, 34 (2003), 203-236.

<sup>80</sup> Alberti, 'Amateurs and Professionals'.

<sup>81</sup> James E. Bagnall, *The Flora of Warwickshire* (London and Birmingham: Gurney & Jackson and Cornish Brothers, 1891), pp. v-vi.

W. J. Harrison left the editorship of the *Midland Naturalist* in 1887 and was replaced by William Hillhouse (1850-1910), the first Professor of Botany at the newly established Mason Science College in Birmingham. This institution, later to become the University of Birmingham, had been opened in 1880, with T. H. Huxley giving a typically polemical address on 'Science and Culture', in which he attacked classical scholars as men who 'excommunicated' science from the 'ark of culture'.<sup>82</sup> Initially it was intended to offer instruction on purely scientific subjects, affiliated with the Department of Science and Art in South Kensington, though the arts were increasingly admitted to the curriculum towards the end of the century. The Birmingham Natural History Society took up residence in the college in 1881, leaving their old home at the Midland Institute, thereby aligning themselves with this new site of scientific study. The college itself embodied an ideological departure from the Midlands Institute, in that it shifted away from its initial commitment to provide lectures for 'artisans and operatives', instead catering for the sons of manufacturers who would become directors of the city's industries.<sup>83</sup> William Hillhouse was another Cambridge-trained man of science, but threw himself enthusiastically into Birmingham civic life, serving as president of the Natural History Society and taking an active interest in educational reform.<sup>84</sup>

Upon taking up the editorship of the *Midland Naturalist*, Hillhouse gave the following 'Induction', addressed directly to its readers:

What the *Midland Naturalist* offers to the societies constituting the Union is means for the publication, the prompt publication, of such portions of their Transactions as it is desirable should be immediately published. [...] More than this, in its reports of meetings it gives an opportunity for local societies to publish such diary of their proceedings as *Nature* gives to the learned societies of London.

The reference to *Nature* is particularly telling, and indicates the metropolitan bias of such a publication (as seen from the eyes of a nominally provincial practitioner). Hillhouse was seemingly suggesting that the Midlands itself should rival the capital for

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<sup>82</sup> As quoted in: Paul White, *Thomas Huxley: Making the 'Man of Science'* (Cambridge: Cambridge University Press, 2003), p. 92.

<sup>83</sup> Rodrick, *Self-Help and Civic Culture*, pp. 158-163

<sup>84</sup> *Journal of Botany, British and Foreign*, 48 (1910), pp. 105-106.

scientific activity, and a periodical was a vital medium through which this could be achieved.

However, this could only be done if the societies themselves committed to such a plan. Hillhouse continued:

I would like local natural history societies to remember that they perform only on half of their functions if they live to themselves alone; that their labours to be of real value should also be communicated to others.

In much the same way that individuals pursuing natural history simply for their own amusement and instruction failed to advance science, local societies who were purely parochial in outlook served no purpose beyond that. Scientific progress could only be made if knowledge was circulated beyond its localised context. However, the expense of doing so through the publication of transactions was a cost many societies could not bear. The *Midland Naturalist* aimed to eliminate this problem, placing each reader of the periodical 'upon a footing as it were of partial membership of all the societies from which contributions are received'. In conclusion, Hillhouse stated his 'firm faith in the scientific and natural history resources of the Midland Counties', and claimed himself to be an 'outcome of a local natural history society'.<sup>85</sup> Hillhouse's acknowledgement of his 'scientific parentage' suggests a conscious identification with the tradition of local natural history societies, despite his advanced training and academic position. This is not a professional denying the worth of such organisations, but a case by which such an individual attempts to mobilise the resources of these societies. His aim is twofold, the advancement of science, but also an attempt to construct an identity for himself distinct from the London-centric scientific community represented by *Nature*. The periodical offered a way by which these aims could be achieved, offering the potential for a fruitful collaboration between professional and non-professional practitioners at a time when these two groups were becoming increasingly distinct.

Despite the high-flown rhetoric, the *Midland Naturalist* faced a near-constant struggle for both contributions and subscribers, and it was decided at the 1893 annual meeting of the Union to discontinue the periodical. They resolved to maintain the Union itself, and it is unclear when the organisation ceased to exist. The eighteenth meeting was held at Oxford in 1895, and according to *Jackson's Oxford Journal*, the Union

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<sup>85</sup> *Midland Naturalist*, 10 (1887), pp. 53-55.

appeared to be in a flourishing state.<sup>86</sup> Despite this, it seems the Union did not survive into the twentieth century, unlike their Yorkshire counterparts who remain active to the present.

### **'A Healthy Four-Penny-Worth of Gossip'**

The *Midland Naturalist* was initially published by Hardwicke and Bogue, the same company responsible for another noteworthy natural history periodical, the eponymous *Hardwicke's Science-Gossip*. Founded in 1865 as an 'illustrated medium of interchange and gossip', initially under the editorship of the mycologist Mordecai Cubitt Cooke (1825-1914), this monthly magazine would enjoy a long career. Robert Hardwicke died in 1875, but the company was continued by David Bogue, with the periodical retaining the former's name until it was sold in 1893. The purchaser was John T. Carrington (the 'bohemian' lepidopterist), who renamed it simply *Science-Gossip* and assumed the role of editor. It finally came to an end in 1902, as ever due to 'insufficient financial support'. J. W. Tutt claimed that its collapse was 'bewailed by none so greatly as those who read it at society meetings, etc., but refused their personal quota to ensure its success'.<sup>87</sup> This offers another suggestive example of how periodicals and natural history societies formed a reciprocal relationship, each merging into the other. As will become apparent, *Science-Gossip* is perhaps the best example of how this correlation occurred.

The self-expressed aim of Hardwicke's magazine was to provide its readers with a 'healthy-four-penny-worth of gossip', with 'gossip' not intended to carry any negative connotation.<sup>88</sup> Another definition of this term, which would seem to be the one preferred by Hardwicke's periodical, is 'easy, or unrestrained talk or writing'.<sup>89</sup> In some respects, *Science-Gossip* resembled the *Intelligencer*, placing an emphasis on short notices, correspondence between its readers, specimen exchange, and encouraging anyone to make a contribution. Stainton's weekly was on occasion referred to by correspondents as a medium for 'entomological gossip', and Edward Newman employed this same phrase when re-launching the *Entomologist*, suggesting this was an established mode of scientific discussion. Unlike Stainton's periodical, however,

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<sup>86</sup> *Jackson's Oxford Journal*, 6th July 1895, p. 6. The British Library's newspaper database does not have any records of the Union after this date.

<sup>87</sup> *Entomologist's Record and Journal of Variation*, 20 (1908), p. 124.

<sup>88</sup> *Hardwicke's Science-Gossip*, 1 (1865), p. vi.

<sup>89</sup> 'gossip, n.', *OED Online*, (Oxford: Oxford University Press, 2017), <http://www.oed.com.ezproxy4.lib.le.ac.uk/view/Entry/80197?rskey=dfuvnH&result=1&isAdvanced=false#> [accessed 15th August 2017]

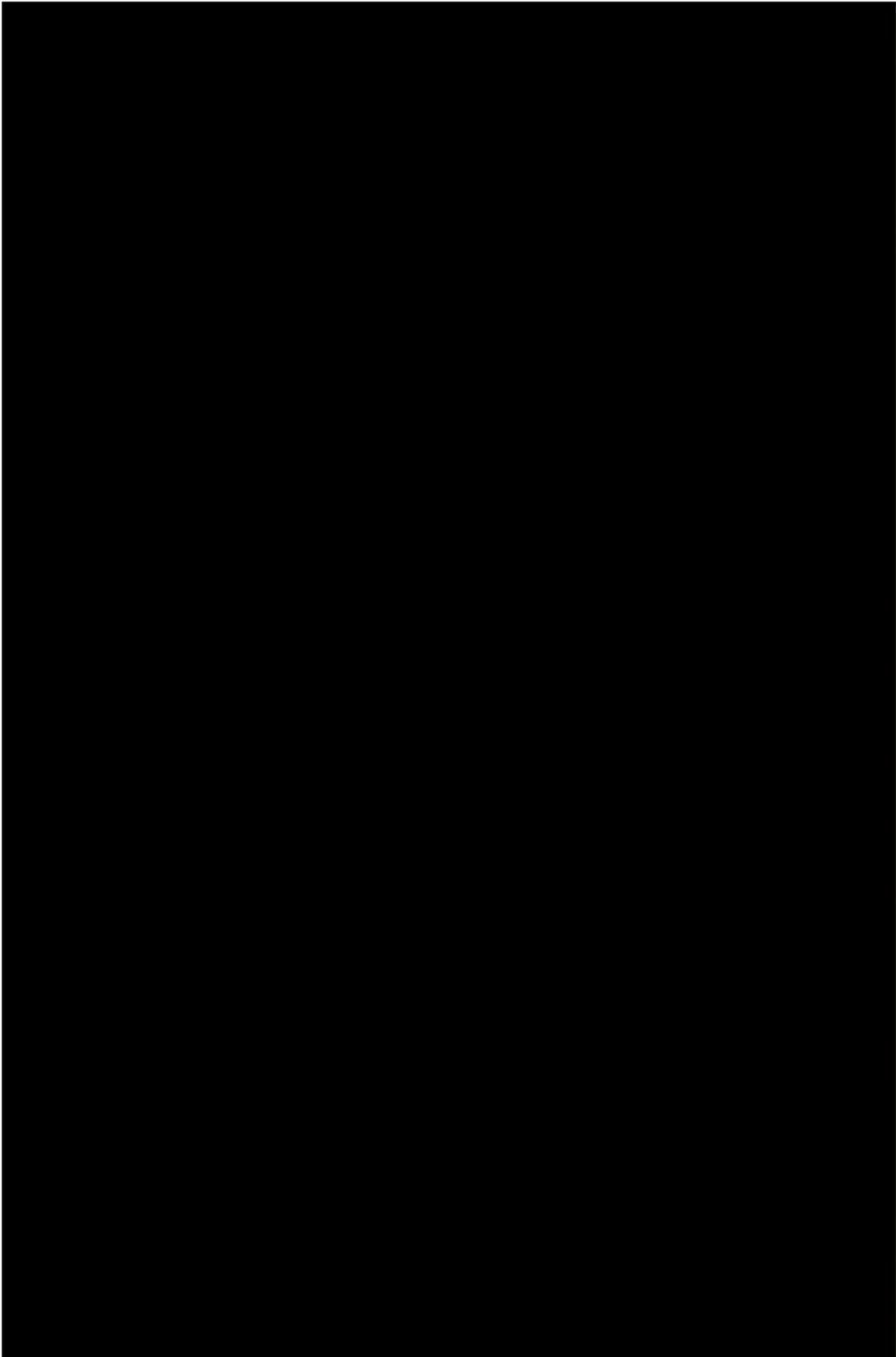
*Science-Gossip* generally contained longer articles intended to be legible to the most unscientific of readers, usually written by professional popular science writers and established experts in the field. Furthermore, as advertised in its descriptive subtitle, an 'illustrated medium of interchange and gossip', these articles were often generously accompanied by images. These images were far more abundant than in many of *Science-Gossip's* rival publications, such as the *Zoologist*, and were usually incorporated into the text as woodcuts rather than separately interleaved as plates. It was unashamedly populist, with its rhetoric of participation conveniently aligning with the commercial imperatives of Hardwicke's business. Although it is difficult to determine the exact nature of *Science-Gossip's* readership, its sales were clearly large enough to sustain the expense of producing such a lavishly illustrated periodical. Crucially, it is likely to have been read predominantly by the very same urban middle classes who were eagerly joining field clubs and natural history societies at this time.

*Science-Gossip* has been referred to in previous chapters, as it became a favoured periodical of many of Stainton's colleagues, such as H. G. Knaggs and Robert McLachlan. For them, it held a distinct purpose, as a place to publish articles on entomological subjects that were written in a far more popular style than those appearing in the *Entomologist's Monthly Magazine*. As was demonstrated in the previous chapter, they held it to be superior to Edward Newman's *Entomologist*, or 'Science Twaddle' as Knaggs satirically dubbed it in contrast to Hardwicke's more esteemed magazine. As has already been mentioned, Stainton himself published a single article in *Science-Gossip* (fig. 4.2), but a misunderstanding with the editor led to an ill-tempered exchange, and he never did so again.<sup>90</sup> Furthermore, Stainton and other entomologists were among the 'scientific friends' of 'European reputation in their own special branches of natural history' who were consulted by the editor for the periodical's 'Notes and Queries' and 'Answers to Correspondents'.<sup>91</sup> On 13th June 1865, M. C. Cooke wrote to Stainton asking 'may I trouble you to determine for a correspondent the name of the moth of which larvae is enclosed'.<sup>92</sup> Cooke appended to his signature, rather pompously, 'Editor of *Hardwicke's Science-Gossip*', just in case there was any doubt in what capacity he was consulting Stainton. This system by which beginners could seek aid through the periodical, thereby gaining access to leading experts, was much akin to

<sup>90</sup> *Hardwicke's Science-Gossip*, 3 (1867), pp. 169-173.

<sup>91</sup> *Hardwicke's Science-Gossip*, 1 (1865), pp. v-vi.

<sup>92</sup> M. C. Cooke to H. T. Stainton, 13th June 1865, STAINT 20:118.



**Figure 4.2** *Hardwicke's Science-Gossip*, 3 (1867), p. 172. A page from H. T. Stainton's only article for the magazine, on the subject of 'Leaf-Mining Larvae', which nicely demonstrates the strong visual element of the publication.

the dynamics of a field club or society, whose meetings often involved tyros bringing their specimens to be identified by the group's recognised authorities. It should also be noted that this format borrowed from *Notes and Queries*, a weekly periodical begun in 1849, through which antiquarians could similarly exchange observations and ask questions.

Early on in *Science-Gossip's* existence, Cooke felt it necessary to justify the periodical's choice of title, which seems to have received criticism from more high-minded individuals who objected to the implied frivolity. Cooke defended 'gossip' in the following terms:

We again announce our name, however undignified it may be, and with it gain admission to the fireside of thousands, whilst the same talisman excludes us, we hope, only from the drawing-rooms of a few. [...] We make no great pretensions, our desire being to gossip with our readers, as a man chats to his friend, of passing events in which we are interested, to ask and answer queries, and pass a pleasant half-hour talking scientific subjects in the language of the fireside, and not as *savans*.<sup>93</sup>

Cooke places the magazine within a particular mode of discourse, easy-going and free of the more abstruse technicalities of science. We have seen in previous chapters how editors of popular magazines aimed to avoid Latin or anything that might preclude the beginner from participation, but *Science-Gossip* frames this in terms of conversation, which is significant when considered in relation to the associational practices of natural history.

### **'Appropriate Subjects for Conversation'**

A leading article in *Science-Gossip* describes how to establish and successfully run a natural history society during the winter months when opportunities for fieldwork and excursions were limited:

In villages it is always easy to hire a room for such a purpose at a trifling cost; and in them, as in towns, one or more parties interested will, in all probability, be able to lend a room or rooms, on one occasion at least. Where practicable, the sociability of the evening is much enhanced by

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<sup>93</sup> *Hardwicke's Science-Gossip*, 2 (1866), p. 1.

having tea or coffee handed round before the real proceedings begin. The conversation which then arises serves to place at their ease those who might otherwise be prevented by shyness from taking part in the business of the evening. Indeed our experience leads us to believe that naturalists seldom find any difficulty in conversing with one another when once the ice is broken; and the pursuit of Nature is so truly Catholic that Churchman and Dissenter, Papist and Protestant, can alike join without any fear of treading upon one another's (mental) corns.<sup>94</sup>

Here, natural history is presented as a neutral topic of conversation that cuts across divisions that would otherwise prove prohibitive to sociability in any other context. Controversial subjects such as politics and religion were often banned at conversaciones, thereby providing 'an otherwise elusive coherence to the diverse and bickering urban middling sort'.<sup>95</sup>

The article went on to describe the kinds of natural objects that should be displayed at a society meeting. Cases of birds or insects ('especially the latter') were popular due to their 'varied and beautiful colours'. Dried plants, on the other hand, 'are seldom much noticed'. 'A Microscope, if available, and if presided over by one well "up" in its use, will be found to excite considerable interest'. Furthermore, 'as many specimens as possible should be exhibited in a living state', such as slow-worms and toads (temporarily housed in glass globes) or water beetles and fish. All these specimens served the following purpose:

The one great advantage gained by exhibition of such objects is, that they, by their presence, furnish and suggest appropriate subjects for conversation; but, in addition, it is always as well to have at least one short paper read by some one present, upon some local or interesting natural production. This should be as much as possible *original*: the writer should speak from his own individual knowledge - and makes a break in the evening, besides affording further material for conversation. The simpler the style of language employed, the better. In the succeeding discussion, many facts

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<sup>94</sup> *Hardwicke's Science-Gossip*, 3 (1867), p. 2.

<sup>95</sup> Samuel Alberti, 'Conversaciones and the Experience of Science in Victorian England', *Journal of Victorian Culture*, 8 (2003), 208-230 (p. 216).

may be elicited which, though perhaps trivial in themselves, all go to perfecting the links of Nature's endless chain.<sup>96</sup>

The emphasis on conversation here is crucial, and there is a striking resemblance between a society meeting as described above and the contents of a periodical such as *Science-Gossip*. The illustrations throughout *Science-Gossip* stand in as specimens, with the favoured subjects often being microscopic objects of the kind so popular at conversaciones and other soirées of a scientific bent. Hardwicke's periodical was far more profusely illustrated than its rivals, playing into the important visual aspects of science during this period.<sup>97</sup> The title of *Science-Gossip* invokes a very specific kind of discourse and, in much the same manner as a natural history society, allowed its readers to indulge in a dialogue upon subjects 'perhaps trivial in themselves', but all forming a part of 'Nature's endless chain'. It is no surprise, therefore, that the editors and publishers of the *Midland Naturalist* chose a remarkably similar format to *Science-Gossip*. Rather than simply presenting it in the manner of a society's transactions, the *Midland Naturalist* resembled its publisher's other periodical in the use of numerous illustrations, correspondence columns, exchange notices, and reports of society meetings.

Conversation was one of the primary modes for engaging in science during the nineteenth century, as embodied by the conversazione, a 'ubiquitous culture event of tremendous significance and popularity, a medley of Victorian urban middle-class life' (fig. 4.3).<sup>98</sup> Occasions such as these formed a vital part of associational culture, held by a wide range of artistic and learned societies throughout the second half of the nineteenth century, though most notably by scientific societies. In many ways, they were conducted in much the same manner as the meeting of a natural history society as described above, but on a far more lavish scale, often hosted within buildings at the centre of civic life. It is highly significant, therefore, that a conversazione was the highlight of all annual meetings held by the Midland Union of Natural History

<sup>96</sup> *Hardwicke's Science-Gossip*, 3 (1867), p. 2.

<sup>97</sup> Bernard Lightman, 'Victorian Science and Popular Visual Culture', *Early Popular Visual Culture*, 10 (2012), 1-5 (and other articles in this special issue); —, *Victorian Popularizers of Science: Designing Nature for New Audiences* (Chicago: University of Chicago Press, 2007), pp. 167-218; Iwan Morus, 'More the Aspect of Magic than Anything Natural': The Philosophy of Demonstration', in *Science in the Marketplace: Nineteenth-Century Sites and Experiences*, ed. by Aileen Fyfe and Bernard Lightman (Chicago: University of Chicago Press, 2007), pp. 337-370; Ralph O'Connor, *The Earth on Show: Fossils and the Poetics of Popular Science, 1802-1856* (Chicago: University of Chicago Press, 2007); Jonathan Smith, *Charles Darwin and Victorian Visual Culture* (Cambridge: Cambridge University Press, 2006).

<sup>98</sup> Alberti, 'Conversaciones', p. 208.

Societies, the sole point at which the constituent members met face to face. This decision located the Union's activities within a middle-class milieu and established them as an element of urban culture. Alberti has argued that the *conversazione* demonstrates the role of science and technology 'in the promulgation of a culturally sophisticated urban middle-class identity'.<sup>99</sup> Hosted by a different member society each year, the Midland Union's annual meeting necessarily became a matter of civic pride and rivalry. Louise Miskell has demonstrated the way in which peripatetic scientific congresses, such as meetings of the British Association for the Advancement of Science, played a significant role in the formation of urban identity and fuelled spirit of competition between towns.<sup>100</sup> It would no doubt have rankled the Cheltenham Natural History Society, who were responsible for the 1881 gathering, that the microscopical display at their *conversazione* was described in the *Midland Naturalist* as 'inferior in extent to that made at former meetings of the Union'.<sup>101</sup>

The second *conversazione* of the Midland Union, held in 1879 at the Leicester town museum, was the first of its kind held in the city. Characteristically for such an event, there was a blend of art and science on display, with 'scores of paintings' temporarily donated by private collectors for public viewing in addition to the more strictly scientific exhibits. Microscopes featured heavily, with around 40 or 50 instruments arrayed in the centre of the space. One exhibitor showed how a single grain of pollen could be measured (and found to be 3,000th of an inch in diameter), while another showed the circulation of blood in the tail of a tadpole, and the 'extraordinary vitality of animalculae in a rain drop'. 'Photographs of insect life' were shown with the use of a binocular microscope. In other parts of the museum, rocks from the nearby Charnwood region were on display, as well as stuffed birds 'prepared for the British Museum'.<sup>102</sup> It was well-attended, with refreshments provided by 'Mr T. Roberts of the Temperance Hall', suggesting that tea rather than anything stronger was provided to stimulate polite conversation. A *conversazione*, as the name implies, was about dialogue amongst the guests, but more importantly, allowed the attendees to discuss the exhibits with the men of science. This was very different to a didactic lecture, as a conversation was 'active,

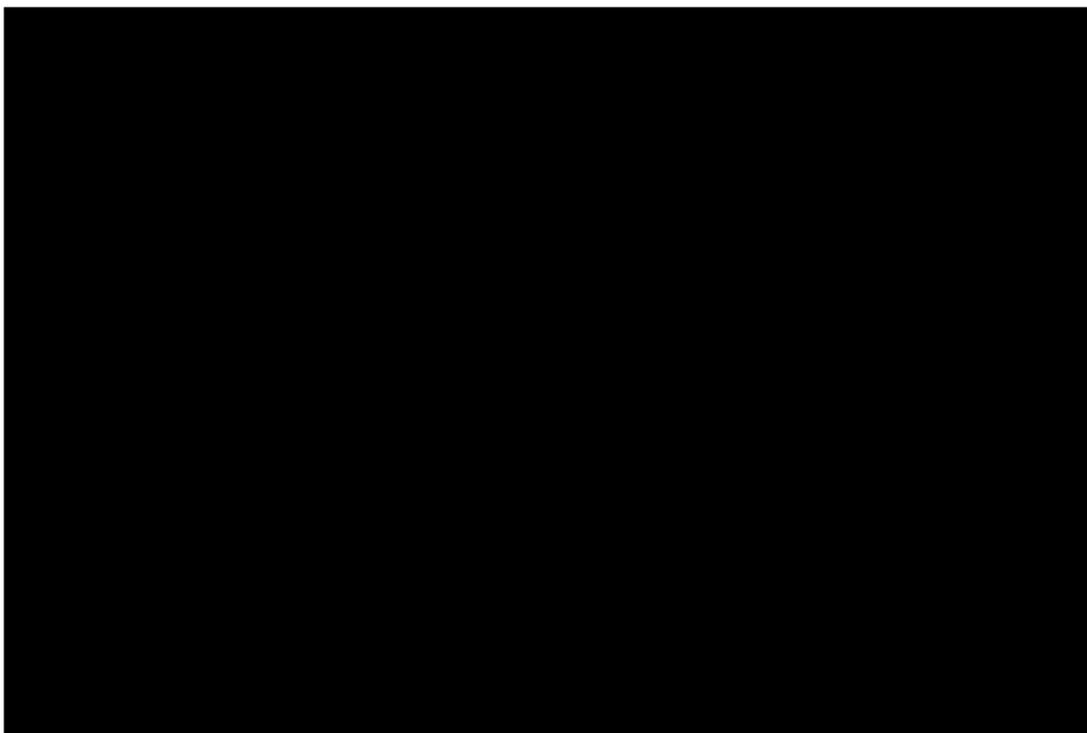
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<sup>99</sup> Ibid., pp. 208-209.

<sup>100</sup> Louise Miskell, *Meeting Places: Scientific Congresses and Urban Identity in Victorian Britain* (London: Routledge, 2013).

<sup>101</sup> *Midland Naturalist*, 4 (1881), p. 179.

<sup>102</sup> *Leicester Chronicle*, 24th May 1879, p.3.



**Figure 4.3** 'Scientific Conversazione at the Apothecaries' Hall', *Illustrated London News*, 28th April 1855, p. 405. This gives an excellent impression of a nineteenth-century conversazione, showing an eclectic mix of science, art, and conversation. On the left can be seen scaled-up images of microscopic creatures, and the specimens themselves can be viewed first-hand through microscopes arranged upon the tables.

challenging the notion of one-way transmission of expert knowledge'.<sup>103</sup> Likewise, the emphasis placed on interchange and correspondence by a periodical such as the *Midland Naturalist* meant that it could serve a similar function to the conversazione, engendering discussion and inviting contributions from its readers rather than simply presenting the results of a scientific elite. However, a periodical served a far more important role than a conversazione, acting as a permanent record of the society's activities and, more importantly, providing a medium for the circulation of knowledge.

Gowan Dawson has argued that the *Cornhill Magazine* sought to replicate middle-class forms of sociability and oral communication, 'including conversation, gossip, and literary table-talk, that were characteristic of forums of middle-class culture like dinner-parties, conversaciones, and metropolitan clubs'<sup>104</sup> The *Athenaeum* also covered both science and the arts through the medium of gossip columns. In a very similar way, *Hardwicke's Science-Gossip* consciously sought to replicate associational modes of

<sup>103</sup> Alberti, 'Conversaciones', p. 223.

<sup>104</sup> Gowan Dawson, 'The *Cornhill Magazine* and the Shilling Monthlies in mid-Victorian Britain', in *Science in the Nineteenth-Century Periodical*, ed. by Geoffrey Cantor, Gowan Dawson, et al. (Cambridge: Cambridge University Press, 2004), pp. 123-151.

science through its conversational tone. Conversation and 'gossip' were one of the primary modes by which the urban middle classes participated in science during the nineteenth century, in the form of conversaciones, societies, and less formal social gatherings. As discussed in the first chapter, a periodical created a new, imagined form of scientific community, but the way such communities were envisaged followed established conventions. A periodical served as a virtual natural history society, bringing its readers into weekly or monthly communion with each other to share observations and discuss ideas. It recreated through the print medium similar forms of sociability to those enjoyed by members of natural history societies and field clubs, in allowing individuals to meet and freely discuss scientific subjects.

### **'The Steady Accumulation of Facts'**

Another common thread uniting *Hardwicke's Science-Gossip* and the *Midland Naturalist* was a hierarchical sense of the scientific community. We have already encountered the Yorkshire Naturalists' Union's vision of an 'army' of private soldiers, ready to plunge into action and collect the raw data of science. Likewise, *Science-Gossip* made no attempt to scale the heights of *savans*, but nevertheless hoped that it could make some limited contribution. T. H. Huxley, speaking to the Quekett Microscopical Club as their president for 1879, looked upon these self-professed 'amateurs' with approval.

I have a sort of feeling in regard to them such as an old recruiting sergeant might be supposed to have whilst looking at a band of rustics sporting on a village green, or at a number of volunteers going through their evolutions. These athletic exercises are all very well in their way, but the recruiting sergeant with an eye for a man, will see that the sport is training those who have a vocation for the realities of war, and is leaving them to feel their way towards taking part in more serious business. Many of the papers which I have heard in this room have given me the feeling that I should much like to give the shilling, and putting my hand upon the readers, say 'Your proper business is to come into the army of science'.<sup>105</sup>

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<sup>105</sup> *Journal of the Quekett Microscopical Club*, 5 (1878-79), p. 251.

Huxley is employing the same martial metaphors seen in evidence elsewhere with regards to natural history societies.<sup>106</sup> Again, this implies a strict hierarchy, with non-professionals, who pursued science for the recreation, cast in the mould of 'rustics'. They may have had raw talent, but they required discipline and drilling by Huxley and his new cadre of biological instructors. This would seem to confirm Huxley as the arch-professionaliser he is so often characterised as. However, Huxley continued, suggesting he should 'separate myself from the recruiting sergeant', as 'those of you who have a turn for really scientific work may not do better to stop where you are'. He argues that the Quekett club members 'have opportunities which are not possessed by the men who make science a business'. Huxley argues that 'whoever becomes a man of science by profession' must be a master of both 'detailed work' and 'general facts' as this is the only way he can 'sustain his claim' to the authority of such a position. This was a task becoming ever more difficult, as over the last quarter of a century, science had grown in a 'portentous and astonishing fashion', leaving even the most industrious practitioners unable to keep up with the 'stream of progress of scientific knowledge'. If an individual wished to 'work out any scientific points with accuracy and detail', this would necessarily occupy their whole attention and thereby leave them adrift from the latest developments.

Members of the Quekett Club, or indeed any society devoted to the life sciences, were therefore 'vastly better off' in Huxley's opinion. He claimed: 'you can give your attention to any point which you want to get at the bottom of, and you are not likely to be pulled up by some student in the lecture room who has read the latest thing'. The majority of 'problems' in microscopy necessitated 'neatness and skill, clearness of eye, and lightness of hand', but the 'great amount of general knowledge which a man of science is required to have is of no consequence at all'. Here, Huxley is holding up the 'amateur' as a vital component of a wider scientific community, fulfilling a necessary task that the professionals could not. These foot soldiers need not concern themselves with the grand picture, which is best left to their superior officers. 'What is most wanted is an exhaustive study of some of the commonest things about us', and it was in the

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<sup>106</sup> For a brief discussion of Huxley's wider usage of the 'military metaphor', see: Adrian Desmond, *Huxley: Evolution's High Priest* (London: Michael Joseph, 1997), pp. 250-254.

hands of natural history societies to remedy this. Huxley concluded, 'you may find plenty of work if even you confine yourselves to such common things as caterpillars'.<sup>107</sup>

Huxley's address was reproduced in the *Midland Naturalist* - with his blessing - the following year (1880), the editors thinking it an 'admirable paper'.<sup>108</sup> Later that year, Huxley was unanimously elected as honourable vice-president of the Birmingham Natural History and Microscopical Society, 'in recognition of his distinguished services to biological science'. Edward Badger, in his capacity as president to that society in the same year, addressed them in much the same terms, reiterating a similar hierarchical distinction between the roles of science's humbler votaries and its leading practitioners:

I refer to the steady accumulation of facts - items of real knowledge - which the accurate observers in our society and others of like kind are making. It is only at rare intervals that men of genius enrich us by enunciating some new law which exceptional insight and laborious work has enabled them to discover, such, for instance, as that of evolution, the greatest generalisation of modern times. But the humblest student who concentrates his efforts, and takes ordinary precautions to avoid wrong conclusions, has it in his power to definitely add to our knowledge in relation to some created thing if he will simply set the object clearly before his mind and work definitely for its attainment. These isolated facts, if sufficiently vouched for, and recorded in some enduring way, will one day have real value for other observers, and may contribute bricks for some future worker of the higher class to build with.<sup>109</sup>

This was a shift from the broadly construed scientific community conceived of by the popular natural history periodicals of the first half of the century. There is a far more obvious delineation of the 'humble student' who particularises and the 'higher class' worker who generalises, though the former's value is acknowledged. Badger, as editor of the *Midland Naturalist*, was playing his own role in recording 'in some enduring way' the 'isolated facts' gathered by the observers scattered across the midland counties.

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<sup>107</sup> *Journal of the Quekett Microscopical Club*, 5 (1878-79), pp. 251-255.

<sup>108</sup> *Midland Naturalist*, 3 (1880), pp. 25-28.

<sup>109</sup> *Report and Transactions* [of the Birmingham Natural History and Microscopical Society] *for the year 1881*, p. viii.

Without periodicals serving to circulate the data collected by this army of workers, the efforts of these workers could make no contribution to science. A preface to the 1874 volume of *Science-Gossip* expressed this in much the same terms:

Natural Science is extending its borders and increasing in the range and boldness of its speculations. Only a few, however, are privileged to stand on its mountain peaks, and view the land that is afar off! But it is surely not too ambitious a hope to entertain that the facts collected and recorded in such magazines as *Science-Gossip* afford some additional data out of which the great scientific superstructure is being built.<sup>110</sup>

Rather than entirely excluding non-professionals from participation in science, this conception of a scientific community allowed men such as Huxley to maintain their authority within the field, whilst simultaneously affording a place for the naturalists of Birmingham (for instance). It is possible to trace a complex relationship between the emergent professional class of biologists, trained in the colleges newly established during this period, and provincial natural history societies. A more detailed and nuanced study is required, but an examination of periodicals such as the *Midland Naturalist* offers a suggestive account of how this was renegotiated.

### Conclusion

Edward Badger, speaking before the Birmingham Natural History Society, provides us with a particularly apt metaphor for the work of such groups:

Among the benefits which societies like ours confer must be included the giving to all who frequent our meetings the power, equal to a new sense, of perceiving the infinitely great in the infinitely little.<sup>111</sup>

The increasing ubiquity of the microscope amongst practitioners of natural history in the second half of the nineteenth century is evident when reading many provincial natural history society periodicals. As one president of the Midland Union of Natural History Societies described, these instruments 'converted the ground we tread, the rocks we climb, and the rivers and seas we fathom, into new worlds of life', providing a 'fresh

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<sup>110</sup> *Hardwicke's Science-Gossip*, 10 (1874), p. ii.

<sup>111</sup> *Report and Transactions* [of the Birmingham Natural History and Microscopical Society] *for the year 1881*, p. viii.

and inexhaustible range of inquiry'.<sup>112</sup> The fascination with hitherto invisible 'new worlds' among both practising naturalists and the wider nineteenth-century public made them a popular subject in all manner of publications, as well as exhibitions and conversazioni. What is also apparent is the degree to which the microscope opened up a previously inaccessible field of study for many, and offered tantalising possibilities for a careful observer to make discoveries, even among the 'commonest things about us'. The work of local natural history societies can be similarly conceived in terms of the micro and the macro. By focussing an intense, systematic study on a relatively small area, the members of these societies aimed to make a small contribution to a much larger whole. Periodicals such as the *Midland Naturalist* were conceived of as the medium through which this contribution could be made, even if they did not necessarily achieve the high ideals their editors propounded.

A study of the periodicals produced by natural history societies in the second half of the nineteenth century allows us to understand how the urban middle classes created and consumed scientific knowledge. If we are to understand the place of science in popular culture during this period, it is this group we must look to, as they were the driving force of associational natural history. Samuel Alberti has emphasised how science and civic culture were 'entangled', constituting the 'rituals and performances of the maturing middle classes that were key aspects in their construction of cultural hegemony'.<sup>113</sup> Closer attention to natural history in a provincial context makes it apparent that we must be sensitive to the differences between cities such as Birmingham and the metropolitan community represented by Stainton and his London-based colleagues, and provides suggestions for further study in the construction of scientific identities among practitioners beyond the capital's learned societies. Furthermore, it demonstrates how natural history periodicals were shaped by associational practices of urban science, engaging people with the same mix of spectacle and gossip. Taken as a whole, this reveals a growing sense of hierarchy within the life sciences, with a growing cadre of professionals placed at the head of an army of volunteers who willingly carried out the groundwork of science. Once again, we see practices of natural history serving aims of the nascent discipline of biology.

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<sup>112</sup> *Midland Naturalist*, 2, p. 138.

<sup>113</sup> Alberti, 'Conversazioni', p. 224.

## CONCLUSION

### **The *Twaddler's Magazine***

Camden Farebrother, the parson-entomologist in George Eliot's *Middlemarch*, proudly shows off his specimen collection to the newly arrived doctor, Tertius Lydgate, suggesting to the idealistic medical man:

Suppose I ask you to look through my drawers and agree with me about all my new species? [...] That would be a good discipline, you know, for a young doctor who has to please his patients in Middlemarch. You must learn to be bored, remember.

The vicar, Farebrother, has made an 'exhaustive study of the entomology of this district', and is 'going on both with the fauna and flora'. Lydgate, on the other hand, admits that he 'never had time to give myself much to natural history', as his interest in 'structure' is entirely satisfied by his profession: 'I have no hobby besides'. Farebrother apparently finds his own vocation far less fulfilling, and expresses a need for 'spiritual tobacco' that his insects can provide for him. The clergyman self-deprecatingly lists a number of abstruse pastimes that such unfortunate men as himself find to occupy themselves, one of which is the writing of 'small items about a variety of *Aphis brassicae*, with the well-known signature of Philomicron, for the *Twaddler's Magazine*'.<sup>1</sup>

Eliot's novel, a 'study of provincial life', was published in parts from 1871-72. It is set in the fictional midlands county of North Loamshire, just before the First Reform Act of 1832. Despite this historical framing, the (also fictional) *Twaddler's Magazine* sounds very much like a playful reference to *Hardwicke's Science-Gossip* and other natural history periodicals contemporary to the writing of *Middlemarch*. The 'Philomicron' - lover of small things - who writes letters regarding aphids to this magazine could stand for many of the individuals who have featured in this thesis. Eliot's portrayal is not entirely sympathetic, however, as her study of middling provincialism must be taken to denote both geographical location and the narrow-mindedness of small-town life. Farebrother is at least conscious of his parochial occupation, joking that Lydgate must humour him despite the physician's clear lack of interest in entomology. The parson-naturalist was a common figure in the nineteenth

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<sup>1</sup> George Eliot, *Middlemarch: A Study of Provincial Life* (Edinburgh and London: William Blackwood and Sons, 1874), pp. 125-127.

century, and in this sense Middlemarch's own vicar can be read as typical of his kind, but as always with Eliot's writing, there is more to it than this. The author evokes a particular mode of practising natural history, strictly bound to a specific locality and focussed upon some of the tiniest creatures within it. This is another manifestation of provincialism, with Farebrother standing in contrast to Lydgate, the doctor informed by the very latest scientific methods. Both men employ microscopes in their researches, though Lydgate's instrument is far more powerful and potentially serves a more useful purpose.

This conception of the amateur naturalist, chasing butterflies for no purpose but their own satisfaction, was a well-established trope in the nineteenth century and remains so to the present. However, the *Twaddler's Magazine* aside, periodicals served to integrate the localised efforts of many practitioners into wider networks of knowledge production. Through such publications, they participated in communities that played a significant role in shaping the life sciences in the second half of the century. This complicates notions of 'high' and 'low' science, as practices such as corresponding and collecting were held in common amongst these practitioners. Likewise, the difference between 'amateurs' and 'professionals' is one that has been overplayed in historical analysis, obscuring the various ways identity and scientific authority were fashioned in this period. In light of this, we must reformulate our understanding of 'popular science', moving away from such dichotomies. The taste for natural history remains strong at present, with television series dedicated to grand wildlife spectacles and the animals that inhabit our gardens. Furthermore, the ubiquity of the internet has brought about a new era of 'citizen science', by which anyone can make a contribution by counting penguins or spotting zebras from the comfort of their own homes.<sup>2</sup> This thesis historicises these developments, demonstrating the process by which the apparent divide between scientists and citizens was beginning to be drawn during the nineteenth century, and how this continues to inform our perceptions.

Henry Tibbats Stainton died on the 2nd December 1892. The *Entomologist's Monthly Magazine* later recorded that his collections of Lepidoptera, along with his entomological correspondence, were presented to the Trustees of the British Museum (as the Natural History Museum had yet to become an independent institution) by Isabel

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<sup>2</sup> *Penguin Watch*, <https://www.penguinwatch.org/> [accessed 19th October 2017]; *Snapshot Serengeti*, <https://www.snapshotserengeti.org/> [accessed 19th October 2017].

Stainton, Henry Tibbats' widow. The materials were made 'immediately accessible to students', as stipulated by the conditions of the bequest made in consultation with Robert McLachlan and J. W. Douglas. These specimens represent the labours of many more collectors than Stainton himself, as it has been demonstrated how he amassed these insects through the 'sympathy of a crowd', cultivating a large network of correspondents who supplied the microlepidopterist with all he required. It was noted by the *Entomologist's Monthly Magazine* that his European *Tineidae* in particular surpassed 'anything of the kind' possessed by the museum at that time.<sup>3</sup> Whilst many contemporaries of Stainton's may not have enjoyed the considerable advantages his wealth ensured, the *Entomologist's Weekly Intelligencer* and other periodicals created communities of practitioners whose labours should not be overlooked.

Continuity in entomological practice is apparent between the nineteenth and twenty-first centuries. In September 2017, a paper was published in the *Coleopterist* announcing the discovery of a beetle in Scotland - *Pogonocherus caroli* - which had hitherto never been recorded in Britain. The species is rare worldwide, only found to occur in a handful of other sites across Europe. The article addressed the important question of whether the insect should be considered as an 'overlooked member of the native fauna', or a more recent 'introduction' from continental Europe (either by natural or artificial means). With 'some caution', the former conclusion was reached, and a recommendation made for the species to be accordingly assessed for conservation status.<sup>4</sup> This was a significant discovery, as it is increasingly unusual to find native British species that have not previously been documented, unlike in the period when Stainton was actively collecting and publishing such news on a regular basis in the *Intelligencer* and *Entomologist's Annual*.

Biodiversity is becoming a topic of ever greater consequence as debate over the effects of climate change grows more pressing. Tracing the incidence of species, both geographically and temporally, has therefore taken on a new and vital meaning. As we are faced with implications of the recently declared Anthropocene epoch, forcing us to consider humanity's global impact, nineteenth-century natural history periodicals have become a valuable repository of environmental data. The observations made and

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<sup>3</sup> *Entomologist's Monthly Magazine*, 29 (1893), pp. 173-174.

<sup>4</sup> Martin Rejzek and Maxwell Barclay, '*Pogonocherus caroli* Mulsant, 1863 (Cerambycidae: Lamiinae) New to Britain, from Two localities in Scotland', *Coleopterist*, 26 (2017), 123-127.

recorded by countless naturalists over hundreds of years remain a key resource for current biologists who seek to understand how ecosystems have changed over long periods of time. The Biodiversity Heritage Library seeks to make this material readily available worldwide through digitisation, stating that the inaccessibility of such information - held mostly within a select number of libraries and archives - 'is one of the chief impediments to the efficiency of research in the field'.<sup>5</sup> The latest developments in communications technology thereby continue to shape practices in the life sciences.

An additional reason the discovery of *Pogonocherus caroli* has relevance to this thesis in particular is the nature of its detection. Martin Rejzek, the man who found the beetle whilst collecting insects in the highland pine forests of Scotland, is not a professional entomologist. Although he is a scientist, working in the field of biological chemistry, Rejzek is an 'amateur' naturalist, pursuing the study of beetles in his spare time. The published paper was co-authored with a recognised professional, Maxwell Barclay, the London Natural History Museum's senior curator of Coleoptera. In an interview regarding the discovery, Barclay expressed his opinion that *P. caroli* had remained unknown to other collectors due to the seasonality of its appearance: 'the beetles are around in the autumn and winter but most entomologists who are collecting in Scotland are doing so in June and July. So the beetles are active when the scientists aren't'.

Despite the many changes to the practices of science over the last century and a half, some of the same considerations effect current entomologists in the field as much as their nineteenth-century forebears. Barclay continued:

The discoverer collects insects as a hobby, [...] but if it wasn't for expert amateurs like him - like Charles Darwin and the ones who built up the Museum's collections - we would know much less about the biodiversity of this country and the world. It is brilliant to know that this rare species exists in Britain, and pure good fortune for science and conservation that Dr

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<sup>5</sup> 'About', *Biodiversity Heritage Library*, <http://biodivlib.wikispaces.com/About> [accessed 19th October 2017].

Rejzek had the right knowledge, and was in the right place at the right time, to discover it.<sup>6</sup>

Whilst describing Darwin as an 'amateur' is problematic, this nevertheless demonstrates an awareness of continuity. Regardless of the questions the life sciences seek to answer, either the classification of species or more complex ecological issues, what remains is the necessity of a certain person being in a particular locality at a specific moment in order to record an observation or catch an insect. Stainton recognised the need for individual naturalists to communicate effectively, and without periodicals to circulate this information, the process by which scientific knowledge was produced would have been considerably limited. To directly answer the query posed by the first issue of the *Intelligencer*, this is why 'entomologists want a weekly newspaper'.

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<sup>6</sup> James McNish, 'New Native British Beetle Found in Ancient Scottish Forests', *Natural History Museum* (28th September 2017), <http://www.nhm.ac.uk/about-us/news/2017/september/new-native-british-beetle-found-in-ancient-scottish-forests.html> [accessed 18th October 2017].

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