

# Editing entomology: natural-history periodicals and the shaping of scientific communities in nineteenth-century Britain

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**Abstract.** This article addresses the issue of professionalization in the life sciences during the second half of the nineteenth century through a survey of British entomological periodicals. It is generally accepted that this period saw the rise of professional practitioners and the emergence of biology (as opposed to the older mode of natural history). However, recent scholarship has increasingly shown that this narrative elides the more complex processes at work in shaping scientific communities from the 1850s to the turn of the century. This article adds to such scholarship by examining the ways in which the editors of four entomological periodicals from across this time frame attempted to shape the communities of their readership, and in particular focuses upon the apparent divide between ‘mere collectors’ and ‘entomologists’ as expressed within these journals. Crucially, the article argues that non-professional practitioners were active in defining their own distinct identities and thereby claiming scientific authority. Alongside the periodicals, the article makes use of the correspondence archive of the entomologist and periodical editor Henry Tibbats Stainton (1822–1892), which has hitherto not been subject to sustained analysis by historians.

‘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.<sup>1</sup>

Writing in 1890, the schoolmaster, entomologist and periodical editor James William Tutt (1858–1911) showed little patience for the condescending manner exhibited by those who considered themselves to be scientific entomologists towards individuals who collected insects for less high-minded reasons. The distinction alluded to by Tutt – drawn between true entomologists and those who ‘only’ collected – was persistent throughout the nineteenth century, with Tutt being unusual in his defence of the latter. Writing in 1838, John Obadiah Westwood (1805–1893) described the very ‘lowest class of entomologists’ as those ‘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

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This research was conducted as part of the AHRC-funded Constructing Scientific Communities: Citizen Science in the Nineteenth and Twenty-First Centuries project. I would particularly like to thank Gowan Dawson, Sally Shuttleworth, Paul Cooper, Julie Harvey, Geoff Belknap, Issy Staniaszek and Richard Fallon. I am also very grateful for the complimentary and constructive feedback of Charlotte Sleight and two anonymous reviewers.

1 *Entomologist's Record and Journal of Variation* (1890) 1, p. 99 (subsequently *Entomologist's Record*).

arrangement other than that of beauty and colour or size'.<sup>2</sup> A truly scientific entomologist, on the other hand, collected insects with the aim of studying and classifying the specimens, thereby contributing to the production of knowledge. This division is, of course, an oversimplification, but it does indicate the broad spectrum of motives and activities that fell under the loose definition of 'entomology' during the nineteenth century.

Tutt's observations were published in the *Entomologist's Record and Journal of Variation* (1890–), one in a succession of entomological periodicals established in Britain from the 1850s onwards, each with a distinct character and agenda. This period saw rapid growth in the number and influence of journals and magazines dedicated to all branches of science, and enterprising editors sought to utilize this burgeoning medium to construct scientific communities.<sup>3</sup> The periodical had a far greater reach than other forms of communication, such as correspondence or learned-society meetings, and it therefore brought together a much wider range of practitioners than more traditional modes of scientific networking. Editors usually had strong opinions as to the form these communities should take, and who exactly was permitted to participate. Whether their readerships conformed to the editors' expectations is another matter, but the debates provoked within the pages of the periodicals and the editorial strategies that dictated their content nevertheless demonstrate the multivocal conceptions of what constituted correct scientific practice.

Through a survey of entomological periodicals published during the second half of the nineteenth century, this article addresses the key question of professionalization in the life sciences. It is widely accepted that this period saw the emergence of professional practitioners within the life sciences, and a concomitant growth in institutions, standardization and specialism. Thomas Henry 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 marginalization of 'amateurs' in the practice of science. 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>4</sup> Jim Endersby has critiqued the framing of Clarke's work, suggesting that such an account of professionalization is teleological, failing to address the 'delicate and protracted negotiations' through which 'professional' and 'amateur' became distinct.<sup>5</sup> Samuel Alberti likewise cautions against the treatment of 'professionalisation as a historiographical meta-narrative', when in fact it was a 'historically and geographically contingent endeavour'.<sup>6</sup>

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. 28.

3 For a recent study of this topic see Geoffrey Belknap, 'Illustrating natural history: images, periodicals, and the making of nineteenth-century scientific communities', *BJHS* (2018) 51, pp. 395–422. See also the forthcoming volume Sally Shuttleworth, Gowan Dawson, Bernard Lightman and Jon Topham (eds.), *Science Periodicals in Nineteenth-Century Britain: Constructing Scientific Communities*, Chicago: The University of Chicago Press.

4 J.F.M. Clarke, *Bugs and the Victorians*, New Haven: Yale University Press, 2009, pp. 187–215.

5 Jim Endersby, 'Review of *Bugs and the Victorians*', *Reviews in History*, at [www.history.ac.uk/reviews/review/924](http://www.history.ac.uk/reviews/review/924), accessed 26 April 2018.

6 Samuel Alberti, 'Amateurs and professionals in one county: biology and natural history in late Victorian Yorkshire', *Journal of the History of Biology* (2001) 34, pp. 115–147, 141.

The work of Bernard Lightman has demonstrated the complex ways in which scientific identities were self-consciously shaped by ‘popularizers’ in the second half of the nineteenth century, pointing the way towards a more nuanced account of how disciplinary authority was contested.<sup>7</sup> However, Alberti’s call for a wider study of the concomitant refashioning of amateur and professional practice in this period requires further attention, and this article goes some way towards addressing the historiographical desideratum. As the work of Ruth Barton, Melinda Baldwin and Alex Csiszar has demonstrated, periodicals were a vital medium through which the boundaries of scientific communities were negotiated and established, allowing editors and readers to articulate a sense of shared identity and legitimize their claims to knowledge.<sup>8</sup> The distinction that certain actors drew between scientific ‘entomologists’ and unscientific ‘collectors’ exemplifies what Barton terms the ‘language of self-description’, and an analysis of such terminology across a range of periodicals allows us to chart the shifting landscape of the life sciences from the 1850s to the 1890s.<sup>9</sup>

The case of entomology in particular is instructive for a number of reasons, though it is not intended to suggest that the study of insects is representative of natural history as a whole. Entomology eschewed the trend towards laboratory-based, institutional science for longer than other branches of the life sciences, and therefore provides a suggestive counterpoint to accounts that emphasize such developments. Furthermore, despite (or perhaps because of) the popularity of insect collecting, entomology often struggled to be taken seriously as a science throughout the nineteenth century. Henry Walter Bates (1825–1892), who produced the first scientific account of mimicry in animals through a study of Amazonian insects, hoped 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>10</sup> Without the more obvious practical applications of botany or geology, entomology was prone to be characterized as a pointless and eccentric pastime, pursued by dilettantes more interested in capturing rare beetles or beautiful butterflies than in the rigours of systematic scientific research. 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. It is no coincidence that very few entomologists attained the privilege of election to the Royal Society during this period. As this article will demonstrate, it is this sense of inadequacy that animated much of the efforts taken by entomological-periodical editors to mould their readerships into a more disciplined community of practitioners. The

7 Bernard Lightman, *Victorian Popularizers of Science: Designing Nature for New Audiences*, Chicago: The University of Chicago Press, 2007.

8 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* (1998) 55, pp. 1–33; Melinda Baldwin, *Making Nature: The History of a Scientific Journal*, Chicago: The University of Chicago Press, 2015; Alex Csiszar, *The Scientific Journal: Authorship and the Politics of Knowledge in the Nineteenth Century*, Chicago: The University of Chicago Press, 2018.

9 Ruth Barton, ‘“Men of science”: language, identity, and professionalization in the mid-Victorian scientific community’, *History of Science* (2003) 41, pp. 73–119, 73.

10 Henry Walter Bates, *The Naturalist on the River Amazons*, 2 vols., London: John Murray, 1863, vol. 2, p. 346.

hostility towards unscientific ‘collectors’, as described by Tutt, was therefore symptomatic of the insecurity felt by those who wished entomology to be perceived as a science rather than a hobby.

This article is split into four sections, each section dealing with a single entomological periodical that commenced publication in Britain during the period under discussion, from 1856 to 1890. The first section examines the *Entomologist’s Weekly Intelligencer* (1856–1861), and the concerns of its editor and readers to distinguish scientific entomologists from those who only collected insect specimens. The second section shows how the editors of the *Entomologist’s Monthly Magazine* (1864–) sought to create a more exclusive community, distinct from that of the *Intelligencer*, excluding ‘mere collectors’ through a strategy characterized as ‘amateurization’. The third section compares the *Entomologist’s Monthly Magazine* to its rival, the *Entomologist* (1864–), in order to illustrate the changes in scientific periodical publishing that occurred in the 1860s. Finally, the fourth section focuses upon the *Entomologist’s Record and Journal of Variation*, which aimed to harness the work of ‘collectors’ in acquiring evidence for the more biologically oriented, Darwinian study of species and evolution.

The selection of periodicals is not arbitrary, as they represent the only entomological periodicals established in this period with the exception of the short-lived *Weekly Entomologist* (1862–1863). As will become clear, these publications shared close ties and overlaps among their editors and readerships, and therefore provide a rich case study of how these communities changed over time. Furthermore, we are permitted a deeper insight into the rivalry between the *Entomologist’s Monthly Magazine* and the *Entomologist* through the remarkable correspondence archive of Henry Tibbats Stainton (1822–1892), one of the most eminent entomologists of the nineteenth century. Stainton established and edited both the *Entomologist’s Weekly Intelligencer* and the *Entomologist’s Monthly Magazine*, but neither the periodicals nor the related correspondence have been subject to sustained analysis by historians. Letters between Stainton and his fellow editors of the *Entomologist’s Monthly Magazine* provide a rare glimpse of the processes behind the production of a scientific periodical, and consequently form a crux of the argument.

### ‘The chaff from the wheat’

Collecting insects was fundamental to the practice of entomology in the nineteenth century, and the methods of capturing these creatures were as varied as the forms they took. As observed by William Kirby (1759–1850), ‘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’.<sup>11</sup> Entomologists therefore spent a great deal of their time in the field, particularly during the spring and summer months when insects are most active and abundant. The majority of entomological research carried out during the nineteenth century was concerned with

11 William Kirby and William Spence, *An Introduction to Entomology; Or, Elements of the Natural History of Insects*, 4 vols., London: Longman *et al.*, 1818–1826, vol. 4, p. 515, original emphasis.

systematic classification, identifying and describing species according to shared characteristics. In this period, the discovery of insect species within Britain was still a relatively regular occurrence, while more intrepid collectors such as Henry Walter Bates and Alfred Russel Wallace (1823–1913) were returning from expeditions around the globe with vast numbers of specimens unknown to Western science. The process of classification was based upon the examination of dead and pinned insects rather than the study of living organisms, just as botanists employed the herbarium sheet to achieve the same end. The acquisition of specimens and amassing a collection were therefore essential in determining the differences and similarities upon which these classifications were founded. However, the pursuit of butterflies and other aesthetically pleasing insects was equally appealing to those who had little interest in scientific classification. Furthermore, the resale value of insect specimens, unlike dried plant specimens, encouraged others to collect with more mercenary aims in mind. Despite these key differences in motivation, all those with an interest in collecting insects – for whatever reason – shared a desire to know exactly when and where certain species occurred in abundance and the most effective methods for catching them. A periodical that shared such information was therefore likely to attract a readership comprising both those who collected for scientific purposes and those who cared nothing for the finer points of insect taxonomy.

The *Entomologist's Weekly Intelligencer* commenced publication in April 1856, costing just a penny per issue, with the aim of providing those who collected insects with a regular, quick and cheap means of staying up to date with each other's activities. Correspondents wrote short notices detailing the species they had captured, recording important information regarding the equipment and techniques used, the weather conditions and their location when the catch was made. The focus was almost entirely on these practical aspects of insect collecting, as stated by the periodical's opening address to its readers:

Sometimes some lucky fellow makes a notable discovery ... and finds that by proceeding in some particular way of search some small species among the *Carabidae*, hitherto almost unique, can be turned up by the score; he is in a hurry to communicate his discovery, that others may make use of it, in order to find some allied species which might probably be met with in other localities, if hunted for in the same way; THE INTELLIGENCER is just the very thing for him.<sup>12</sup>

Aside from a brief leading article by the editor, the bulk of each eight-page issue consisted of communications from correspondents across the country. The *Intelligencer* was therefore not the place to publish in-depth research, and, as will become apparent, the emphasis on collecting attracted a readership that was not entirely committed to the pursuit of entomology as a science.

The *Intelligencer* was established and edited by Henry Tibbats Stainton, who ran the periodical at his own expense. An individual of substantial independent wealth, Stainton was cast very much in the mould of a Victorian gentleman of science, with inherited affluence allowing him to devote his whole life to the pursuit of entomology. He would go on to become one of the leading entomologists of the nineteenth century,

12 *Entomologist's Weekly Intelligencer* (1856) 1, p. 1 (subsequently *Intelligencer*).

with his work on microlepidoptera earning him election to the Royal Society in 1867, an elusive honour for those who made insects their exclusive study. A resident of Lewisham, London, Stainton was embedded in metropolitan scientific society, regularly meeting and corresponding with other leading British and European naturalists of the period.

The *Intelligencer* was unique in that no other natural-history periodical had been published on a weekly basis. Despite this key difference, Stainton's periodical shared some significant similarities with other natural-history periodicals of the 1840s and 1850s, particularly the emphasis on reader contributions. It was printed by Edward Newman (1801–1876), who was the proprietor of a number of other periodicals: the *Phytologist* ('A Popular Botanical Miscellany', 1841–1854) and the *Zoologist* ('A Popular Miscellany of Natural History', 1843–1916), both of which were monthlies. Common to many natural-history periodicals of this period is what Susan Sheets-Pyenson has characterized as an 'ideology of amateur participation', of which Newman was a notable advocate.<sup>13</sup> While any such unqualified use of the term 'amateur' is problematic, it at least signifies that the scientific communities of these periodicals were broadly construed. All contributions were considered for publication, regardless of the correspondent's social or scientific standing. Entomology was not the strict preserve of gentlemanly enthusiasts, and it is worth noting that among the foremost practitioners of this period was Henry Doubleday (1808–1875), a greengrocer who lived near Epping Forest.<sup>14</sup> However, this apparently more democratic mode of natural history was not without its critics, as exemplified by the following debate among the *Intelligencer's* readers.

At the commencement of the *Intelligencer's* fourth volume in April 1858, Stainton's customary leading article began, 'there is a perfect rage for *examinations*', and cited the Civil Service, the East India Company and the Society of Arts as groups in which such tests of aptitude were now requisite. These comments exemplify the 1850s 'mania' for written examinations, which James Elwick has described as an important process of standardization, replacing the more traditional *viva voce* mode of oral questioning.<sup>15</sup> Stainton asked in his article whether such examinations would not 'be very serviceable for entomology?'<sup>16</sup> Naturally, there were 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 invited 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

13 Susan Sheets-Pyenson, 'Popular science periodicals in Paris and London: the emergence of a low scientific culture, 1820–1875', *Annals of Science* (1985) 42, pp. 549–572, 549–561.

14 Robert Mays, 'Doubleday, Henry (1808–1875), naturalist', *Oxford Dictionary of National Biography*, at [www.oxforddnb.com.ezproxy3.lib.le.ac.uk/view/10.1093/ref:odnb/9780198614128.001.0001/odnb-9780198614128-e-7847](http://www.oxforddnb.com.ezproxy3.lib.le.ac.uk/view/10.1093/ref:odnb/9780198614128.001.0001/odnb-9780198614128-e-7847), accessed 5 February 2019.

15 James Elwick, 'Economies of scales: evolutionary naturalists and the Victorian examination system', in Gowan Dawson and Bernard Lightman (eds.), *Victorian Scientific Naturalism: Community, Identity, Continuity*, Chicago: The University of Chicago Press, 2014, pp. 131–156.

16 *Intelligencer* (1858) 4, p. 1.

information'.<sup>17</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>18</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', and 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>19</sup>

The opposing viewpoints expressed by these two correspondents suggest a division in the readership of the *Intelligencer*, between those who self-consciously pursued entomology as a science on the one hand, and, on the other, those who were content with the collection of insects as an end in itself. According to a letter written by 'J.C.B.', an 'entomologist' who collected insects without any desire to study the specimens was not entitled to consider themselves as 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 the wheat, – it would separate those who *collect* insects from *entomologists*'.<sup>20</sup> While most entomologists of this period were active collectors, not all collectors of insects could rightfully claim to be scientific entomologists (at least in the opinion of J.C.B.). Another letter, signed T.J. Stainton (presumably a relation of the editor), makes the basis of this distinction clearer:

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>21</sup>

This strict dichotomy between scientific 'entomologists' and unscientific 'collectors' is more of a rhetorical device than an accurate representation, 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. Consequently, the *Intelligencer* brought together a diverse range of individuals in such a way that could be both fruitful and potentially fraught with tension.<sup>22</sup>

17 *Intelligencer*, op. cit. (16), p. 9.

18 *Intelligencer*, op. cit. (16), p. 30.

19 *Intelligencer*, op. cit. (16), pp. 21–22.

20 *Intelligencer* (1858–1859) 5, p. 181, original emphasis.

21 *Intelligencer*, op. cit. (20), p. 79, original emphasis.

22 The work of Anne Secord on the complex interactions between artisan botanists and their gentlemanly counterparts serves as an instructive comparison. Anne Secord, 'Corresponding interests: artisans and gentlemen in nineteenth-century natural history', *BJHS* (1994) 27, pp. 383–408; Secord, 'Science in the pub: artisan botanists in early nineteenth-century Lancashire', *History of Science* (1994) 32, pp. 269–315.



The information that circulated through the *Intelligencer*, 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 pleasure of amassing an aesthetically pleasing collection. Furthermore, supposedly unscientific collectors were often a valuable source of specimens for their more systematically inclined peers, as demonstrated by the increasingly popular system of exchange facilitated by advertisements placed in the *Intelligencer*. Much of the contention (and not a little confusion) arose from the fact that the terms ‘entomology’ and ‘entomologist’ were applied indiscriminately by actors to cover this broad spectrum of insect-collecting activity, rather than in the stricter disciplinary sense; hence the above assertion that entomology was not respected ‘as a *Science*’. Stainton’s suggestion of examinations was therefore a move towards greater discernment among the entomological community, with full membership requiring more than taking to the fields with a butterfly net.

Ultimately, the difficulties in administering a test of entomological aptitude proved prohibitive. While examinations were generally associated with professional positions, there was no related discussion by Stainton or others advocating for salaried careers in entomology. Their status as non-professional practitioners was never questioned, only their knowledge and proficiency in the scientific study of insects. As Ruth Barton has established, the distinction between ‘professional’ and ‘amateur’ was not necessarily considered an important one by nineteenth-century men of science.<sup>23</sup> Instead, other factors were of far greater significance in establishing the ‘scientific character’ of an individual. In the case of entomology, the distinction between scientific and non-scientific collectors would continue to be a defining factor in the ways periodical editors conceived of the communities they wished to shape through their publications. As will become apparent, the editors of the *Entomologist’s Monthly Magazine* went to significant lengths to exclude from their pages those whom they considered to be non-scientific collectors.

### ‘A labour of love’

The *Entomologist’s Weekly Intelligencer* was discontinued in 1861, as Stainton became disillusioned with the periodical and perhaps fatigued by the effort of producing a weekly periodical for five years. Others stepped in to fill the void left by Stainton’s periodical, with the almost-identical *Weekly Entomologist* (1862–1863) established by a group of teenagers in Bowden, Cheshire. Among these boys was Thomas Blackburn (1844–1912), who had struck up a correspondence with Stainton through the *Intelligencer*, and would go on to become a respected entomologist in his own right. The *Weekly Entomologist* was a shadow of its predecessor, and struggled through a few years of existence before its youthful editors were forced to admit defeat. However, Thomas Blackburn remained undeterred. On 5 March 1864, just short of his twentieth birthday, he wrote to Stainton proposing a ‘new entomological magazine,

<sup>23</sup> Barton, op. cit. (9); Ruth Barton, “‘Huxley, Lubbock, and half a dozen others’”: professionals and gentlemen in the formation of the X Club, 1851–1864’, *Isis* (1998) 89, pp. 410–444.



in the carrying out of which we desire to secure your cooperation'. Blackburn had moved to the capital, entering employment as a civil servant, and made personal acquaintance with Stainton and other members of the Entomological Society of London. He continued, 'ever since the decease of the *Weekly Entomologist* I have been considering various plans for starting a paper on a firmer basis'.<sup>24</sup> With encouragement from the physician and lepidopterist Henry Guard Knaggs (1832–1908), Blackburn's letter to Stainton laid out the blueprint for what would become the *Entomologist's Monthly Magazine*.

Despite Blackburn's role as the instigator of the *Entomologist's Monthly Magazine*, the project was quickly overtaken by more eminent men, who went on to form the first editorial committee. Blackburn himself quit after a few years to pursue an ecclesiastical career. Each man (except Blackburn) had a particular entomological specialism for which he held editorial responsibility. Stainton dealt with microlepidoptera, while the other insect orders were appointed to Henry Guard Knaggs (1832–1908), Robert McLachlan (1837–1904) and Edward Caldwell Rye (1832–1885). Knaggs was 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 choices were therefore made through face-to-face meetings (each taking it in turns to host the others), or through less formal exchanges when they attended gatherings of the Entomological or the 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 and running a scientific periodical. Every detail of the magazine was subject to serious consideration. Presentation was of equal importance to content, with Knaggs consulting Stainton as to the colour of the wrappers (enclosing a number of paper samples to choose from) and upon small details of typography.<sup>25</sup>

It is significant that none of the initial editors of the *Entomologist's Monthly Magazine* held salaried scientific positions, nor did any of their successors (at least for the duration of the nineteenth century). Whilst Stainton and McLachlan were both men of independent means, Knaggs was a doctor with a thriving practice in Kentish Town. Rye had attempted to attain a place within the Zoological Department of the British Museum; his failure to do so led him to take up clerical work and supplement his meagre income through entomological illustration.<sup>26</sup> With the exception of Rye, who was a peripheral figure with regard to the editorial process, Stainton and his colleagues never showed any inclination towards a professional role in science, nor did their periodical serve to advocate such a career path. On the contrary, the preface to the *Monthly Magazine's* first volume boldly claimed that 'the very essence of a periodical like this

24 Thomas Blackburn to H.T. Stainton, 5 March 1864, H.T. Stainton Correspondence from British Entomologists, Natural History Museum, London (subsequently NHM), Box 11.

25 Henry Guard Knaggs to H.T. Stainton, 15 April 1864, NHM, Box 59.

26 See the editors' obituaries: (Knaggs) *Entomologist's Monthly Magazine* (1908) 44, p. 49; (McLachlan) *Entomologist's Monthly Magazine* (1904) 40, pp. 145–148; (Rye) *Entomologist's Monthly Magazine* (1884–1885) 21, pp. 238–240.

is its amateur character (for what hired work is equal to a labour of love?).<sup>27</sup> This statement invoked notions of gentlemanly disinterestedness, seemingly suggesting that any such work done with the object of earning money was tainted and questionable. As Jim Endersby has argued, even those who held professional positions often took pains to disavow any such implication of venal motives in their scientific work.<sup>28</sup> In the case of the *Entomologist's Monthly Magazine*, the amateur was held up as the ideal practitioner, constructing an identity for the periodical and the community it aimed to create.

Whilst one should be wary of the unqualified use of 'amateur' to denote any non-professional naturalist of this period, it is nevertheless instructive to consider the *Entomologist's Monthly Magazine* as an example of 'amateurization', a concept proposed by Samuel Alberti in his study of the life sciences in late nineteenth-century Yorkshire. Alberti acknowledges the 'variety of amateur practices', with definitions being 'culturally and locally contingent', but 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 'amateurization'.<sup>29</sup> This strategy is characterized 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, they emphasized their scientific credentials in an attempt to assert authority as field-based researchers.

A strategy of amateurization 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 regard 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>30</sup>

McLachlan's concerns hinged 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

<sup>27</sup> *Entomologist's Monthly Magazine* (1864–1865) 1, p. iii.

<sup>28</sup> Jim Endersby, *Imperial Nature: Joseph Hooker and the Practices of Victorian Science*, Chicago: The University of Chicago Press, 2008, pp. 22–26.

<sup>29</sup> Alberti, op. cit. (6), pp. 132–136.

<sup>30</sup> Robert McLachlan to H.T. Stainton, 14 March 1864, NHM, Box 66.

little known entomologists should be accompanied by an authority'.<sup>31</sup> This wish for potential contributors to be vouched for by an 'authority' – most probably by 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 method had significant implications for the way in which the periodical was 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 editors of the *Entomologist's 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 twenty-four pages, it was suggested that they include additional pages of 'Intelligencer matter'. Although this term was never explicitly defined, it almost certainly 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:

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>32</sup>

There was likely a strong element of facetiousness in Stainton's choice of words here, with his reference to 'unreadable' articles not intended to be entirely literal. All these letters were sent privately between friends who knew each other well, so it was natural that many are gently humorous in tone and scattered with sly references that can be hard for any other reader to decipher.

Joking aside, it is significant that Stainton, the man responsible for the *Intelligencer*, was against the inclusion of 'Intelligencer matter' 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 publication. Stainton directly equated 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's 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>33</sup>

This statement was 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

31 McLachlan to Stainton, 14 March 1864, NHM, Box 66.

32 Stainton to Knaggs, 10 May 1864, NHM, Box 59.

33 Knaggs to Stainton, 11 May 1864, NHM, Box 59.

can see our way clear towards filling these extra pages with good sound matter'. However, he offered the following warning: '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>34</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 have flooded the magazine with inconsequential and poorly observed notices. Instead, the *Entomologist's Monthly Magazine* was designed for a smaller, more select coterie of entomologists, committed to the advancement of science and the practice of classification rather than to the simple indulgence of a hobby.

The distinction between scientific and non-scientific collectors was not explicitly stated in the discussions between the editors of the *Entomologist's Monthly Magazine*, but it was nevertheless implicit in their decisions regarding the kind of material published in the periodical. The 'heavy matter' referred to is best exemplified by the very first article of the magazine's opening number, which was a far cry from the short, gossipy notices included in the *Intelligencer*: 'New species of butterflies from Guatemala and Panama', written by Henry Walter Bates.<sup>35</sup> This piece was 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>36</sup> Although such work was likely to impress those dedicated to taxonomic entomology, it did not contain information that could be put to practical use by the great majority of British insect collectors, and the Latin phrases and technical terminology would have proved impenetrable to the uninitiated. Bates's article was more akin to the papers read before the Entomological Society of London, and published in their *Transactions*.

By contrast, 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 content 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 intention was embedded in the design of the periodical itself, with the editors discussing such things as pagination and what to print at the head of each page. In deciding whether to place the magazine's title at the beginning of each individual number, Knaggs preferred not to, as this would ensure that 'a year of the mag. bound would look more like a book'. Stainton, in reply, suggested that the 'paging better be at the corners[,] not in the middle[,] being more easy for reference'. At the foot of each sheet, he went on, 'I would put (No. 1 June 1 1864) as in the *Trans. Ent. Soc.*'<sup>37</sup> The magazine was produced with the express intention of being bound into a

34 McLachlan to Stainton, 9 May 1864, NHM, Box 66.

35 *Entomologist's Monthly Magazine*, op. cit. (27), p. 1.

36 Knaggs to Stainton, 30 April 1864, NHM, Box 59.

37 Knaggs to Stainton, 11 May 1864, NHM, Box 59. A copy of Stainton's reply, dated 13 May 1864, is written on the reverse of Knaggs's letter.

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 editors' intent that the periodical be comparable to such weighty scientific work.

The 1860s have been identified as a pivotal period in the history of scientific periodical publishing. Susan Sheets-Pyenson argues that the 1860s saw a move away from the more open, participatory ideal that had inspired the popular natural-history periodicals of the 1840s and 1850s, with a new generation of professionals attempting to 'mould the Republic of Science's amateur practitioners into sympathetic supporters' rather than active participants.<sup>38</sup> Ruth Barton has also examined the changing forms and purposes of scientific journalism in the 1860s, and suggested that the advocacy of professional identities and ideologies was not entirely at the expense of 'amateurism'.<sup>39</sup> However, the *Entomologist's Monthly Magazine* cannot be considered in the same category as the more popular and generalized journals that form the basis of Barton's argument. Stainton and his colleagues were specialists, a state of affairs that was exemplified by the division of editorial labour according to their particular areas of interest within the broader field of entomology, and by the fact that their periodical predominantly catered to other entomologists like themselves, rather than appealing to a wider readership. The *Monthly Magazine* was not an act of 'popularization', but rather a vehicle for continued active participation among a more strictly defined community that was not split along a simplistic dichotomy of amateur and professional. To emphasize this point, it is worth contrasting the *Entomologist's Monthly Magazine* with its rival publication, the *Entomologist*, as such a comparison makes apparent the radical step taken by Stainton and his fellow editors.

### The 'collector's organ'

'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 plans for the *Entomologist's Monthly Magazine* gathered pace. Edward Newman, erstwhile printer of the *Intelligencer*, chose this moment to resurrect the *Entomologist*, a periodical he had originally run from 1840 to 1842. '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, one month before the commencement of the *Entomologist's Monthly Magazine*.<sup>40</sup> Newman described the rejuvenated *Entomologist* as a 'popular monthly journal of British entomology and entomological gossip', in implicit contrast to the *Monthly Magazine*.<sup>41</sup> The *Entomologist* was therefore very much in the same vein as Newman's other periodicals, the *Zoologist* and *Phytologist*, a type of popular

38 Sheets-Pyenson, op. cit. (13), p. 562.

39 Barton, op. cit. (8), p. 29.

40 *Entomologist* (1864–1865) 2, pp. v–vi.

41 *Entomologist*, op. cit. (40), p. xvi.

natural-history publication more akin to those of the 1840s and 1850s than to those appearing in the changing landscape of the 1860s.<sup>42</sup>

At first glance, the *Entomologist* and the *Entomologist's Monthly Magazine* seem to share much in common. Both were published once a month, each costing sixpence per issue. The former was usually around thirty pages in length (with some variation), and the latter twenty-four pages. Although there is no discussion of the *Monthly Magazine's* price in Stainton's correspondence, it seems likely that he and his fellow editors did not wish to be undercut by Newman, despite their willingness to limit the extent of their readership in other ways. Aside from superficial similarities, the key difference between the two periodicals was their intended audience, as demonstrated by Newman's preface to the third volume of the *Entomologist*. He stated that the completed volume's price of seven shillings placed it 'well within the reach of every collector of insects' (conveniently ignoring the fact that his periodical's competition was no more expensive), and noted that he used the term 'collector' advisedly. Newman continued, '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

[g]ive 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 invokes the kind of debate that had previously occurred in the pages of the *Entomologist's Weekly Intelligencer*, wherein certain correspondents had drawn a distinction between scientific 'entomologists' and non-scientific 'collectors'. Rejecting such a rigid division, 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 the style of Newman, 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>43</sup> This claim was almost certainly an exaggeration, but the *Entomologist* clearly proved a viable venture, as the periodical survived Newman and continued – albeit in a considerably altered form – into the twentieth century under different ownership.

While the editors of the *Entomologist's Monthly Magazine* remained perfectly polite to Newman in public, their private correspondence reveals that they held a very low opinion of the *Entomologist's* editor, who became the butt of cruel mockery. Knaggs dubbed Newman 'Ed. Science Twaddle', a play on the popular natural-history periodical *Hardwicke's Science-Gossip* (1865–1893), and a pointed comment on Newman's questionable scientific character.<sup>44</sup> Although Newman and Stainton had been friends and collaborators on the *Intelligencer*, their amicable relationship had since broken down. The

42 Sheets-Pyenson, op. cit. (13).

43 *Entomologist* (1866–1867) 3, pp. v–viii.

44 Knaggs to Stainton, 21 December 1865, NHM, Box 59.

main crime of which Newman seems to have been guilty, 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>45</sup> Although Newman’s position as head of a printing firm 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 consideration may have informed his avowedly populist rhetoric, appealing to the ‘mere collectors’ who far outnumbered the more select number of scientific ‘entomologists’. Furthermore, Newman remained committed to a conception of natural history as an activity 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 on the other perhaps more idealistic, are not mutually exclusive, of course, but it placed Newman’s *Entomologist* in a very different category to the *Entomologist’s Monthly Magazine* and its eschewal of ‘Intelligencer matter’.

Great amusement was afforded to Knaggs and his colleagues by a practical joke played on Newman by a correspondent, Edwin Birchall (c.1819–1884), who sent an observation to the *Entomologist’s* editor regarding the question whether insects experienced pain. In the letter, 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 highly dubious anecdote in his periodical.<sup>46</sup> As a respected entomologist and writer on natural history, it seems somewhat unlikely that Birchall would have passed on such a far-fetched story 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 informed Stainton that Birchall was ‘evidently chaffing E.N. when he sent the extract’.<sup>47</sup> Furthermore, Knaggs subsequently recounted to Stainton – with obvious 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 [Newman’s] verminous corner’. Newman had published private correspondence between the siblings Edwin and Henry Birchall, reproducing an extract in the *Entomologist* (presumably taken from a longer letter) regarding the migration of butterflies.<sup>48</sup> It is not clear how Newman acquired the letter, or if he had been given permission to print it, but the Birchall brothers clearly objected (at the very least) to the scissors-and-paste manner in which Newman had treated it. Again, Knaggs’s accusation that Newman had simply used the letter as convenient filler for the magazine, plugging a gap in his ‘verminous corner’, indicates an unflattering opinion of the *Entomologist’s* editor. It implies that Newman was unscrupulous and indiscriminate in acquiring

45 Knaggs to Stainton, 28 May 1864, NHM, Box 59.

46 *Entomologist*, op. cit. (40), p. 152.

47 Knaggs to Stainton, 8 January 1865, NHM, Box 59.

48 *Entomologist*, op. cit. (40), p. 163; Knaggs to Stainton, 8 February 1865, NHM, Box 59.



copy for his periodical, more eager to fill up space than to uphold any pretence of integrity, in direct contrast to the stringent measures preventing such spurious material being printed in the *Entomologist's Monthly Magazine*.

The mockery of Newman by Knaggs and the *Monthly Magazine's* editors should not be dismissed as the product of personal enmity alone, as the terms in which they belittled the *Entomologist's* editor primarily referred to Newman's compromised scientific reputation. Newman had once been a highly regarded entomologist, a member of the Linnean Society and a founding member of the Entomological Society of London, but his willingness to lend credence to stories of screaming spiders and other such 'science twaddle' seriously undercut his credentials. His proud claim to be a 'collector' rather than an 'entomologist' was a statement that directly aligned him with those whom Stainton, Knaggs and their colleagues were attempting to exclude from the pages of the *Entomologist's Monthly Magazine*. They considered Newman's approach to both entomology and editing outmoded, but crucially, it was not a question of professional practitioners reacting against so-called 'amateurs'. Rather, it was a select group of non-professionals who were more concerned with entomology's claim to be thoroughly 'scientific', and for whom the periodical served as a medium through which their agenda was enacted. However, as the nineteenth century drew to a close, a new generation of entomologists would again seek to redefine entomology.

### **A journal of variation**

By 1890, the *Entomologist's Monthly Magazine* and the *Entomologist* were both in the third decade of their existence. While the former remained largely unchanged, the latter had been sold by the son of Edward Newman, and under new ownership had become much more akin to its rival in terms of content. It was a dissatisfaction with these publications that drove James William Tutt to establish his own entomological periodical in 1890, entitled the *Entomologist's Record and Journal of Variation*. It followed a similar format to the other magazines, being a monthly publication costing sixpence, but was intended for a different purpose. Tutt 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'. His new periodical, however, constituted 'a magazine devoted entirely to the wants of British entomologists'.<sup>49</sup> This declaration was a direct swipe at the preponderance of papers regarding non-British species published by the *Monthly Magazine* and *Entomologist*, which were far less useful for those who collected closer to home.

Tutt was a schoolmaster and a man of considerable energy and entomological attainments, but also notorious for his outspoken and dogmatic manner. Not content with simply describing species from dead specimens, his was a distinctly Darwinian approach, with a more biologically oriented interest in the evolution of insects. Naturally, the *Entomologist's Record* reflected Tutt's preoccupations, and the emphasis on variation in the title signals this agenda. Nor was Tutt alone in this Darwinian turn, moving

<sup>49</sup> *Entomologist's Record*, op. cit. (1), p. 1.

away from strictly descriptive and classificatory entomology. Thomas de Grey (1843–1919), who served as president of the Entomological Society in 1889–1890, observed in his annual address that ‘there is one branch of our study which has shown a tendency to unusual development during the past year’, namely ‘that which deals with those problems to which the minds of men have been turned by the researches of Darwin, Wallace, [August] Weismann, [Raphael] Meldola, [Edward Bagnall] Poulton, and many others’. Referring directly to the *Entomologist’s Record*, he welcomed ‘a new publication devoted entirely to such subjects’.<sup>50</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 who were predominantly concerned with classification.<sup>51</sup>

Given these changes, it is perhaps surprising that Tutt’s *Record* bore a notable resemblance in content 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>52</sup> Published correspondence was organized under a variety of headings, with a great deal of space dedicated to ‘Notes on collecting’. These editorial decisions suggest that, despite the advances of biological entomology, the practices of natural history remained strong. Tutt himself was an avid collector, as this practice 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 reveal 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 the myriad processes that constituted the living organism.<sup>53</sup> The lepidopterist Thomas Algernon Chapman (1842–1921) – a physician by profession – suggested that the ‘mere systematist’, or ‘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. However, Chapman admitted that the ‘mere collector’ was of use in gathering material, ‘and is perhaps more numerous than formerly’.<sup>54</sup>

We may now return to Tutt’s defence of the ‘collector’ with which this article began. The editor of the *Entomologist’s Record* asked of his readers,

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?<sup>55</sup>

50 *Transactions of the Entomological Society of London* (1890), pp. xlix–l.

51 Clarke, op. cit. (4), pp. 114–131.

52 *Entomologist’s Record*, op. cit. (1), p. i.

53 *Entomologist’s Record* (1901) 13, p. 27.

54 *Entomologist’s Record*, op. cit. (53), p. 32.

55 *Entomologist’s Record*, op. cit. (1), p. 99

Tutt did not consider the ‘mere’ collector to be of any less value to science than the systematic entomologist, as the very act of participating within a community enabled such individuals to make a valuable contribution to knowledge. He considered it more important to have collectors scouring the countryside, and potentially providing valuable evidence that could be utilized by others, than it was to exclude those who enjoyed the thrill of hunting insects as an end in itself. 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-professional entomologists, such as the schoolmaster Tutt, chose to identify themselves and others, and how such identities were still being negotiated. It is further evidence of ‘amateurization’, by which the scientific credentials of these practitioners were emphasized. As Tutt concluded, ‘the real collector is a scientific force in our study, and a most valuable unit too’.<sup>56</sup> It would seem, therefore, that despite the changes that had occurred since the days of the *Intelligencer*, there remained a place in entomology for the ‘collector’.

### Conclusion

Although nineteenth-century entomologists were mostly concerned with the classification of insects, they were equally preoccupied with classifying each other. This article has argued that the second half of the nineteenth century saw a fragmentation of the more broadly construed communities of natural history that had characterized the previous decades, and that this change is demonstrated by entomological periodicals. The *Entomologist’s Weekly Intelligencer* brought together a wide range of individuals with a common interest in collecting insects, though not all necessarily shared the editor’s dedication to the scientific study of their specimens. By contrast, when Stainton and his colleagues came to establish the *Entomologist’s Monthly Magazine*, they took a conscious decision to distance themselves from the *Intelligencer*, with the aim of refashioning the entomological community. Their negative reaction to Edward Newman makes it clear that they considered the *Entomologist* and its editor to be lacking in scientific rigour and representative of the dilettantism they wished to eliminate from entomological practice. Finally, the *Entomologist’s Record and Journal of Variation* hailed the biological turn in British entomology during the 1890s, with James William Tutt and others seeking to move beyond systematic classification whilst retaining their identity as predominantly field-based researchers.

The move towards specialization and more exclusive scientific communities in this period is usually associated with the rise of professional practitioners. However, examining the ways in which ‘mere collectors’ were either included in, or excluded from, entomological communities allows us to determine the hierarchies of competence at work within these loose groupings of practitioners, and it is apparent that such rankings were not entirely determined by the agendas of would-be professionalizers. This article was not intended to suggest that entomology is entirely representative across

<sup>56</sup> *Entomologist’s Record*, op. cit. (1), p. 99.

the full range of the life sciences, but it nevertheless indicates that a sensitive approach and a new vocabulary are required if we are to recover the complex ways in which scientific expertise and authority were negotiated in this period. More work is required to determine how this process was enacted in other settings, beyond the limited (albeit influential) confines of the X-Club and London's learned societies. With the rise of 'citizen science' in recent years, a historicized perspective of scientific participation is all the more necessary if we are to understand how the implied distinction between 'scientist' and 'citizen' has been constructed. It is clear that these categories remained fluid at the beginning of the twentieth century, and it is a matter for continued debate whether the separation ever truly solidified.