Collecting women in geology: opening the international case of a Scottish ‘cabinétière’, Eliza Gordon Cumming (c. 1798–1842)

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Abstract: The double meanings of ‘case’ in the subtitle pinpoint the dual investigations of this chapter. It first puts the case for better understanding of women’s contributions to ‘serious’ geology in international, as well as national, contexts by overtly collecting British women collectors in the field who contributed to French geological knowledge. It can then unpack the pivotal importance of women’s geology collections and women collectors ‘at home’ in the establishment of new global subfields of geological work in the 1840s, despite more famous names being given national and international recognition for key discoveries. Our examination of the geology case in point—the collection and its expert collector, Lady Eliza Gordon Cumming—discloses her international geological expertise but also longer transnational heritage of women’s scientific collecting practice. By proposing the French term ‘cabinétière’ to name its clearer status, this chapter investigates the implications of serious retrospective relabelling for geology when a woman discoverer-collector is restored and reconnected to her world collections.

In celebrating the centenary of the first women Fellows of the Geological Society of London, this chapter reopens and extends the important research on the ‘roles of women in the history of geology’ collected in the volume of the same title (Burek and Higgs 2007). The strategic question and challenge still to be addressed is how the many unheralded, subject-defining, women in pre-twentieth-century geology—those ‘unofficial fellows’ in its formative history—can better be identified, acknowledged and given their due official-scientific and public recognition. Modern re-inventorying of a woman ‘fossil hunter’ such as Mary Anning (1799–1847) as a ‘palaeontologist’ in all but name, to retranslate the terminology of her times as ‘greatest fossilist’ (Torrens 1995 as an authority study of Anning) into ours, only partly resolves the larger problem of women’s exclusions and omissions from the history of science, including geology. Especially when also hidden in plain sight as footnotes in the works of key men in their fields, the fate of women in pre-twentieth-century geology is double. If theirs are confined, as Abir-Am and Outram (1989) have argued, to supporting secondary, rather than leading primary roles through familial relations with more famous geologist fathers, husbands and brothers, their expertise also remains framed within the domestic, rather than the public, professional and international sphere of these alliances. Never ‘proper’ geologists in their own right, such women then also depend on modern rescuers with greater or lesser unconscious bias regarding the plural histories of the geological sciences. Take Anning’s work and exclusions from ‘geology’ by sex, class, creed and education. Her example is now widely explained, collected, popularized and reframed through recognition narratives (Cave 1988), or foundling identification stories (Robert 1972) that reveal the true riches despite the rags. These powerful cultural storylines then counter-produ-c tively re-domesticate major women such as Anning, as well as her higher-born sisters in science like Lady Mary Somerville (1780–1872), as rescued maiden exceptions within the history of British (gentleman) geology. To account for a woman’s scientific contribution as attributable largely through her male relations or domestic spheres avoids wider investigation of her public-international participations, and primary agency in serious science that is understood to be without sex (class, or nationality).

This chapter challenges reductive, two-sphere, models for women’s major scientific contributions by first reassessing the parameters for serious early-nineteenth-century geology in the field, irrespective of sex, to reframe the space for women’s primary and co-equal contributions to it. If they work as principal agents in (national) geology, this then also positions them potentially at its international frontiers, because women’s cultural education in the gentlemanly class included knowledge of Europe’s main science vernaculars of the period, French and German. English became the lingua franca of science only in the early decades of the twentieth century. The rediscovery of several indicative British women in international field geology in its formative period of the 1800s to the 1840s creates an important roster which includes Lady Eliza

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Gordon Cumming (c. 1798–1842). Our onward focus and case study expands and redirects the work of Andrews (1982), Creese (2007) and Trythall (2012) to make her better known by specifically examining the roles of serious collectors (of both sexes) in geology of this key period in Britain. We therefore use ‘collectors’ and ‘collecting’ henceforth to call out investigative field geology as expert knowledge and dissemination work, before later terminologies elevated the ‘professional’ (‘scientist’) over the ‘amateur’ (leisure) scientist-dilettante. In the early nineteenth century, the direct consequence of barring women from committee membership of national geological and other scientific societies was to give them no official route – via delivery of papers on their own findings then published in official transactions – for due acknowledgement of their scientific discovery, authority and expert status. We illuminate how Eliza Gordon Cumming became nonetheless a foremost (woman) collector in international geology and palaeoichthyology of the period, including in her curatorship of her own collections, as an alternative route for major scientific publication at the global forefronts of her field.

To uncover the international case of Eliza Gordon Cumming’s work in palaeoichthyology in Britain and in France in the 1840s is thus also to rediscover the longer heritages of expert field collecting in women’s transnational scientific practices. Their no less expert scientific role, status and pioneering collecting work in the history of geology then needs more formal recognition. In proposing the French term ‘cabinétière’ (Gargam 2009) to spearhead serious onward collecting of other expert women collectors in geology in Britain, France and elsewhere, this chapter unpacks its applications and implications. The reuniting of the discoverer-collector and her world collections brings more women in geology into the limelight because such reconnection necessitates the important retrospective relabelling of major museum geology collections. The result will be the long overdue international public, as well as scientific, recognition of foremost (British) women in pre-twentieth-century international geology.

‘Serious’ (international) collecting in geology

What, then, defines the serious collector in the formative early nineteenth-century period for European geology as different from the dilettante or informed amateur adding to his/her private cabinet of curiosities? Irrespective of particular national context, were protocols in place for determining serious geological collecting practices in the field as distinct from natural scientific or mineralogical collection endeavours also destined for museum collections? Could serious collecting in geology already include women in theory, as well as in practice? Alexander von Humboldt’s major exploration of South America with Aimé Bonpland in 1799–1804, first published in French, opens with a key passage that offers precise dating of serious collecting and collection practice:

Having stated the general object I had in view in my expeditions, I shall hasten to give a slight sketch of the whole of the collections and observations which we have accumulated, and the union of which is the aim and end of every scientific journey. The maritime war, during our abode in America, having rendered communications with Europe very uncertain, we found ourselves compelled, in order to diminish the chance of losses, to form three different collections. Of these, the first was embarked for Spain and France, the second for the United States and England, and the third, which was the most considerable, remained almost constantly under our own eyes. Towards the close of our expedition, this last collection formed forty two boxes, containing an herbal of six thousand equinoctial plants, seeds, shells, insects, and, what had hitherto never been brought to Europe, geological specimens, from the Chimborazo, New Grenada, and the banks of the river Amazon

(Humboldt and Bonpland 1814, pp. x–xi, emphasis added).

If Humboldt takes the full credit here for securing the first major haul of new geological specimens from the Americas for European science, his reference to ‘maritime war’ (i.e. the Napoleonic Wars) catalogues international conflict as being among the many practical realities of scientific journeys overseas that could result in the loss of specimen collections and field notebooks in carefully packed crates. Their waterlogging or loss overboard in storms at sea were regular occurrences, as were pirate attack, shipwreck, and loss of life to ‘native’ attack, accident or tropical illness of the collector. Cultural histories of early nineteenth-century Germany, Britain and France thus categorically deny that women could undertake scientific and geological exploration as discoverer-collectors, because they lacked the necessary scientific education, national and international mobility, and stamina to overcome such adverse physical conditions. Humboldt’s salutary practices here are, however, to diminish all loss of scientific collections to history. They therefore apply also to the safeguarding of valuable women collectors. The first practice is to collect in triplicate and in different locations, with the further advantage of trebling dissemination of specimens to allied international jurisdictions and scientific institutions. The second is to specialize in geology strategically among, and connected to, other major domains of specimen collecting. Both provide restoration spaces for the unheralded woman geologist operating at home as well as abroad via her
knowledge of languages and collection cultures cognate with geology. Such a multi-informed intercultural mediator will then often display particular resourcefulness in masking, or better offsetting, her own ‘principal’ roles in geological discovery and modes of its publication by aligning them with the dictates of female authorial decorum. Indeed, Humboldt’s ‘I’ as the expert geologist highlights such conventions of ‘offsetting’ in that it stands for the ‘we’ of his co-collector and co-investigator(s). Humboldt could not have undertaken his successful geological mission to the Americas without his chief botanist, Aimé Bonpland (1773–1858), or their many indigenous guides: these local specimen ‘hunters’ and ‘gatherers’ (i.e. collectors in all but name) included members of both sexes.

Humboldt’s record of expert collecting methods and protocols therefore dates ‘serious’ international collecting in geology at the late-Enlightenment turn of the European nineteenth century. The acclaimed geologist’s name on the publication title page then also cracks open the need for more precise co-collector identification that acknowledges and recognizes secondary men as well as primary women in ‘his’ geology overseas and at home. A case in point is Sarah Bowdich (1791–1856) in the history of geology of Madeira in its foundational early nineteenth-century development (Orr 2014). Her training and mentorship under Alexander von Humboldt in Paris in 1819–23 alongside her husband, T. Edward Bowdich, and widowhood in 1824 resulted in her publication of ‘his’ Excursions in Madeira and Porto Santo (Bowdich 1825) in English but also a longer French edition (Bowdich 1826) containing Humboldt’s important epilogue. This evaluates the Bowdichs’ superior mapping of Madeira and measurement of its peaks by comparison with von Buch’s earlier account, and Humboldt’s own on Tenerife en route to the Americas.

The occlusion of Sarah’s work and major contributions to knowledge of Madeiran geology in modern Anglophone and European history of (women in) geology illustrates how deleterious blind spots are created when women’s science is understood only to exist if delimited by secondary status and ‘domestic’ ambitions (Abir-Am and Outram 1989). Even when women published key findings in their own name – as in the case of Maria Graham (1785–1842) (Thompson 2012, 2020) – these are dismissed as not ‘serious’ geology because they are by a woman. Findings can be overlooked and ignored entirely if penned by a ‘non-national’ woman contributor to world geology such as Sarah Bowdich, who left no legacy of specimen collections and undertook no geological work in Britain or France. If this chapter therefore activates the onward collection of British women contributing to new international knowledge in nineteenth-century geology, it also shifts awareness to the pivotal expertise of their material collecting and collections as being on an equal, or more important, footing than publications. Major women ‘in the field’ too readily disappear in their status as footnotes – literal and metaphorical – in the published accounts of significant geological discoveries of the period allegedly all by, and only by, men. For example, Charlotte Murchison’s (1788–1869) more informed interests in geology than those of her famous husband, Roderick, were recorded in candid correspondence by their peer Mary Somerville (1780–1872):

Our greatest geologist, Sir Roderick Murchison, with his wife, were among the English residents at Rome. At that time he hardly knew one stone from another. […] Lady Murchison – an amiable and accomplished woman, with solid acquirements which few ladies at that time possessed – had taken to the study of geology; and soon after her husband began that career which has rendered him the first geologist of our country

(Kölbl-Ebert 1997, p. 39). Let us now look more seriously for women collectors ‘at home’ at the forefront of establishing new global subfields of geology.

‘Serious’ (international) collectors in geology: double standards in cameo?

The increased prominence and curation of serious geological, as distinct from extensive shell, rock or mineralogical collections in the early nineteenth century also needs more precise dating and understanding. As Kölbl-Ebert (2001, p. 182) noted in the contexts of Germany and Britain:

During the 18th century, women appeared as owners of natural history collections, some of which have become the nuclei of today’s museum collections. The beginning of geological research in a modern sense and thus the beginning of geological history occurred around 1800. In Germany, the early professionalisation of geology effectively precluded the collaboration of women, whereas a non-professional culture of natural sciences in Britain stimulated a local “Cambrian Explosion”: Women appeared in great numbers as assistants to male relatives, as field geologists, collectors, taxonomists, and draughtswomen [emphasis added].

The highlighting of the key position of collectors and collections here is to renegotiate and reshape more carefully Kölbl-Ebert’s (2001) overly gendered hierarchies of male and female expertise. As distinct from their leisureed counterparts with amateur pastime interests including the popularization of geology, such as Rosina Zornlin (1795–1859), or ‘fossil shop’ collectors, such as Mary Anning making livings from sales (Larsen 2017), serious
women 'collectors par excellence' in geology like Etheldred Benett (Burek 2001) not only owned but also curated their collections. Through their expert work in the field, they are in consequence much more than the (secondary) 'assistants to male relatives' contended by Kölbl-Ebert (2001). As specialist taxonomists and often their own expert preparers and illustrators, such women operated in the same public national, and potentially international, scientific spheres as their published male collector peers in geology. Take as prime example the catalogue printed for private distribution by Sir

![Fig. 1. Sir Philip Grey Egerton Bart., A Catalogue of Fossil Fish in the Collections of the Earl of Enniskillen & Sir Philip Grey Egerton, Bart. 1837. Printed for private distribution by J. Seacombe, Chester. From the Ernst Mayr Library and Archives of the Museum of Comparative Zoology, Harvard University by kind permission.](http://sp.lyellcollection.org/Downloaded from http://sp.lyellcollection.org/)
The Third Earl of Enniskillen (1807–86), MP for Co. Fermanagh, 1831–40, and Colonel of the Fermanagh Militia, 1834–75, was a ‘nobleman of high culture’, and a distinguished amateur scientist who travelled throughout the Continent pursuing his geological interests. These he acquired at Oxford, where he fell under the spell of Dean William Buckland, the University’s first Professor of Geology. The 3rd Earl’s bent was practical, not academic. He wrote next-to-nothing on geology, but concentrated on creating an important fossil collection at Florence Court. There, in 1835, he altered and made fireproof the south pavilion to house his collection, of which he published a catalogue in 1837. The collection, of almost 10,000 specimens, attracted leading geologists to Florence Court from all over Europe, but was sold to the British Museum (for the huge sum of £3500) in 1883 – possibly because he had gone blind in c. 1870 and could no longer enjoy it. […] He was given doctorates by law by the Universities of Dublin, Durham and Oxford, and was a Fellow of the Royal Society, a Fellow of the Geographical Society, a member of the Royal Irish Academy, Vice-President of the Geological Society of Dublin (1839–64) and first President of its successor, the Royal Geological Society of Ireland (1865). […] The 3rd Earl’s correspondence is almost completely devoid of anything relating to fossil fish and geology (emphasis added).

Among the recent contributions that have most added to our knowledge of fossil fishes of the Devonian system, I must accord the foremost place to what Lady Gordon Cumming has undertaken to illustrate this ancient fauna. Not content to collect and disseminate to geologists with a liberality without equal her numerous specimens of these precious remains, which she had extracted from a quarry mined for these purposes, she studied them carefully to set apart the most perfect illustrative specimens, and painted them with detailed precision and artistic talent that few naturalists have been able to attain. Her drawings and those of her daughter, who was her constant assistant in these studies, therefore form the chief ornaments of my monograph. By delivering this collection to the public, it pains me to think that this noble lady will no longer be able to receive in person the tribute she so justly merits of the recognition of geologists. May this memory, scattered on her tomb, remind her worthy emulator that her eagerness to assist her mother has contributed to elevating to her a lasting monument in the world of science (emphasis added).1

This is no woman ‘fossil-hunter’ (Creese 2007, p. 40), or geological amateur with ‘zeal and liberality’ to quote William Buckland’s ‘Anniversary Address to the Geological Society of London’ of 1841, printed in The Annals and Magazine of Natural History in 1842:

Philip Grey Egerton entitled Fossil Fish in the Collections of the Earl of Enniskillen and Sir Philip Grey Egerton, Bart, republished by permission in The Annals and Magazine of Natural History in 1841 (vol. 7, pp. 487–498). Figure 1 reproduces the first page of the privately circulated three-page version of the same information digitized in the Ernst Mayr Collections of the University of Harvard [https://archive.org/details/fossilfishincoll00enn/page/n2]. It illustrates the density of its specialist information concerning the ‘Genus and Species’, (rock) ‘Formation’ and ‘Locality’ of the collection that later formed the nucleus of British (Natural History) Museum holdings and exhibits of fossil fish, as Malcolmson (1998, pp. 100–102 and 120) elucidates in his cameo of its major nineteenth-century geologist/geology co-collector:

William Cole Third Earl of Enniskillen’s many honours in scientific and geological societies for his world collection of fossil fish were not for his specialist contribution to their science. Rather, this ‘voracious collector’ (Trythall 2012, p. 243) for personal prestige in geological science was the recipient of generous gifts of new fossils in 1840 from Lady Eliza Gordon Cumming (c. 1798–1842), his female social counterpart and ‘serious’ geologist foil. The ‘foremost’ collector of fossil fishes of the ‘Old Red’ between 1840 and her premature death in 1842, Eliza is acknowledged precisely by this prefatory accolade in 1844, when the leading world expert in the field, Louis Agassiz (1807–73) published his Monographie des Poissons Fossiles du vieux grès rouge ou système dévonien (Old Devonian Sandstone) des Îles Britanniques et de Russie (p. vii):

1Translations unless otherwise stated are mine. The original is:

Parmi les contributions récentes qui ont le plus augmenté nos connaissances sur les poissons fossiles du système dévonien, je dois placer en première ligne ce qu’a fait lady Gordon Cumming en vue d’illustrer cette ancienne faune. Non contente de collecter et distribuer aux géologues, avec une libéralité sans égale, les nombreux exemplaires de ces précieux débris qu’elle faisait recueillir dans une carrière exploitée dans ce but, elle les étudiait avec soin, mettait à part les exemplaires les plus parfaits, et les peignait avec une précision de détail et un talent d’artiste que bien peu de naturalistes ont su atteindre. Aussi ses dessins et ceux de sa fille, qui l’a constamment assistée dans ces études, formeront-ils un des principaux ornements de ma Monographie. En livrant ce recueil au public, il m’est pénible de penser que cette noble dame ne pourra plus recueillir elle-même le tribut si justement mérité de la reconnaissance des géologues. Puise ce souvenir, semé sur sa tombe, rappeler à sa digne émule que l’empressement qu’elle mettait à seconder sa mère a contribué à lui élever un monument durable dans le monde scientifique!
During the past year great additions have been made to our stores of knowledge, and specimens in fossil Ichthyology, by the presentation to our Museum of a very large and rich collection of fishes from the lower beds of the old red sandstone near Forres, which we owe to the zeal and liberality of Lady Gordon Cumming of Altyre.

Her Ladyship and her eldest daughter have further contributed the most accurate and exquisitely finished drawings of the many fossil fishes from the same locality, in illustration of Dr. Malcolmson’s paper on the old red sandstone. These ladies have also supplied many further drawings to the forthcoming volumes of Professor Agassiz. Further information on the fishes of the old red sandstone has been acquired by the diligent researches and extensive collections made in the same department of palaeontology by many scientific gentlemen in the counties of Caithness, Elgin, Nairn, Aberdeen, Forfar and Fife: following up the researches that were begun in this almost new and most curious subject by Dr. Fleming, Professor Sedgwick, Mr. Murchison, Dr. Traill, Dr. Malcolmson and Mr. H. Miller

(Buckland 1842 p. 159, emphasis added).

While Buckland’s classifications and acknowledgements of Lady Gordon Cumming and her eldest daughter Seymour are strictly correct—they were the ‘most accurate’ illustrators for Malcolmson and for Agassiz’s (1844) Monographie containing Lady Gordon Cumming’s signed scientific drawings—his words are very economical indeed with the larger scientific and geological truth. Here on display is Buckland’s conditioned (and indicative gentleman geologist) prejudice against a ‘foremost’ woman in his scientific field, as Lady Gordon Cumming is described in the more generous wording of Agassiz, which Buckland had heard and also seen in print to formulate his report. As the inside title page of Agassiz’s Monographie makes very clear, the work was written by request of the British Association for the Advancement of Science (BAAS), with extracts presented at its meeting in Manchester in 1842 which Buckland attended (Agassiz 1844). But he, Agassiz, Murchison and others such as Lord Enniskillen had also attended the BAAS meeting in Glasgow in 1840 (Davies 1968), where Lady Gordon Cumming’s expert collecting work, and liberality in sharing her prized fossil fish specimens, came to ‘serious’ geological attention.

By contrast with Buckland’s reductively derivative portrait of her, Agassiz’s more celebratory 1844 cameo encomium endorses Lady Gordon Cumming’s practice of world collecting in geology à la Humboldt—multiple disseminations of her collections to other world experts in her field and her specialist work as an expert scientific illustrator of her own discoveries (Andrews 1982) – as his peer in scientific knowledge but not in scientific prerogative. Although her expertise enabled her to ‘set apart the most perfect illustrative specimens’, in other words to identify and curate scientific type specimens that define future classification of fossil species, his was to name, describe and publish them for the first time in his Monographie, including her first discovery of ‘Cheiracanthus cummingiae’. Agassiz and her signed scientific illustration which was also published in his work. The issue of (im)proper labeling, naming and attribution in scientific discoveries and collections by women could not be better epitomized than this example. While Agassiz’s Linnaean classification of this species of Cheiracanthus attributes ‘Cummingiae’ to acknowledge its discovery to a ‘foremost’ woman in geology and palaeoichthyology, it represents only one of her many discoveries overtly named for her. The Earl of Enniskillen’s collection also includes a specimen – see Egerton (1837) and the central column in Figure 1. Agassiz, however, remains for posterity the recorded scientific expert, ‘Agassiz’, by naming, describing and publishing Lady Gordon Cumming’s first discovery of this fish among many others. His due acknowledgement of her authority throughout the Monographie as the expert ‘first’ discoverer-collector and supplier of his (type) specimen allows him both to credit her work and concurrently to ‘debit’ its pivotal specialist knowledge. Relying upon and deriving from it is his ultimate pronouncement of superior expertise: for example, regarding his authoritative understanding of the characteristics of the larger genus:

I established this genus already in 1835 in my Research on Fossil Fish, by describing and illustrated the two species then known, the Ch. Trailli and Ch. minor. Since then, the handsome ['belles'] discoveries by Lady Gordon Cumming in the quarries at Lethen-Bar, in Nairnshire, have brought knowledge of a new species that is admirably conserved, which allows completion of its characteristics, so that the genus Cheiracanthus can now be envisaged as one of the best known from this rock formation

(Agassiz 1844, p. 44, emphasis added).2

2The original is:

J’ai établi ce genre dès 1835, dans mes Recherches sur les Poissons fossiles, en décrivant et figurant les deux espèces alors connues, les Ch. Trailli et Ch. minor. Depuis lors, les belles découvertes de Lady Gordon Cumming, dans les carrières de Lethen-Bar, dans le Nairnshire, ont amené à la connaissance d’une nouvelle espèce admirablement conservé, qui permet d’en compléter tous les caractères, en sorte que le genre Cheiracanthus peut maintenant être envisagé comme un des mieux connus de ce terrain.

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Instead of elevating a ‘lasting monument’ to her science as his preface claims, Agassiz’s (1844) Monographie makes her expert collections just the ‘Old Red’ pedestal upon which he stands as the leading world authority on palaeoichthyology above other (‘local’) geologists listed in Buckland’s (1842) report. As the cameo of the Earl of Enniskillen above and the history of British ‘gentleman geologists’ in Britain of the period further endorses (e.g. Wyse Jackson 2004; Smith 2016), ample are the honours for geological collections and collecting legacies if they are made by an Earl, a Lord or Baronet such as Sir Philip Egerton, who are nationally (and internationally) important. Without question, the glaring evidence is Agassiz’s Monographie – Lady Eliza qualified more substantially in 1840 than they for Fellow status of the Geological Society of London, both for her expert geology and for her (private) donations of fossil fish to its specialist collections, except that she was but ‘Lady’ Gordon Cumming.

The social hierarchies and intense rivalries between prominent British men in mid-nineteenth-century geology to establish their places in new subfields, such as palaeoichthyology and the future of its wider fields, explain the entrenchments of cultural double standards regarding the unusual prominent woman (rival) peer also contributing to this geological knowledge. Overly national history of (women in) geology then erases their roles entirely, as Figure 1 amply illustrates. The lists assume that the science is unequivocally by men, unless one has wider knowledge that ‘Cheirolepis cummingsæ’ names an otherwise unacknowledged woman ‘fellow’ in the geological field. Our international optic on Lady Gordon Cumming, however, immediately permits retrospective relabelling of her greater importance and roles in and for pre-twentieth-century geology. When we investigate her case – the material discoveries and the discoverer – more carefully through their triple cataloguing by Agassiz, Buckland, and Enniskillen and Egerton, hers is much more than an honourable mention.

Recurating the labels

To date, Andrews (1982) provides the most comprehensive account of Lady Gordon Cumming’s specimens in the ‘Royal Scottish Museum’ (the National Museum of Scotland) among others, as well as in the illustrations in Agassiz’s (1844) Monographie but not its untranslated French text. This provides further unequivocal evidence for the recovery of her ‘foremost’ achievements at the international forefront of ‘Old Red’ palaeoichthyology. Indeed, Agassiz’s text exemplifies, but fails to acknowledge or apply, the logic and import of his doctoral dissertation (Doctor of Medicine at Munich in April 1830) that science has no sex, and that its future is by women:

‘The superiority of woman to man,’ […] in which he takes the ground that, according to the law of geological progress, woman having been created last was the most perfect being

(Guyot 1883, pp. 50–51).

Electronic availability of the Monographie facilitates immediate access to its substantial provenance data. Excluding all references to ‘Cheirolepis cummingsæ’, a word search for ‘Cuming’ reveals Agassiz’s 14 direct and full acknowledgements of Lady Gordon Cumming’s expert discovery-collecting work and collections (Agassiz 1844, pp. 6, 28, 38, 42, 44, 45, 51 and 63). Failure to read the text in full, however, means the loss of Agassiz’s six additional major acknowledgements (Agassiz 1844, pp. 12, 13, 14, 16 and 17) of the collection, (type) specimens and specialist illustrations by ‘Lady Gordon Cuming’ [sic]. Equally untraceable to electronic searches is information about the foundational impacts of Lady Gordon Cumming’s discoveries in Agassiz’s ‘Table synoptique’ of fossil fishes of the ‘Old Red’, collated by genus. Thirteen (of the 15 in total in 1840) belonging to four major genera (see Table 1) are due to her extensive specialist collecting work in the quarries ‘(de)Lethen-Bar’ and represent the ‘liberality of Lady Gordon Cumming of Altyre’ (Buckland 1842). Agassiz’s text thus also unequivocally disambiguates the ‘confusion’ of provenance – ‘Altyre and Lethen-Bar, two Middle Old Red Sandstone fish localities?’ (Andrews 1983) – in the Anglophone study: all 13 came from ‘Lethen-Bar’ rather than ‘Altyre’ (as Andrews also argues). The collocation of the place of discovery, ‘Lethen’, (Egerton 1837) with their first woman discoverer then allows us to reread very differently the three-page catalogue (Egerton 1837) listing the fish species alphabetically. As the left column in Table 1 shows, 11 fishes with ‘Lethen’ as their locality in the Florence Court collection map directly onto Agassiz’s 13 with known discoverer provenance in the Monographie. Indeed, Agassiz’s text also confirms Lady Gordon Cumming’s specimen donations to Lord Enniskillen and ‘Sir Philipp [sic] Egerton’ (Agassiz 1844, pp. 14, 28, 38, 42 and 64), respectively, for Pterichthys productus, Coccosteus oblongus, Cheirolepis microlepidotus, Diplocanthus striatus and Glyptolepis leptopterus, as well as for Cheirolepis cummingiae. Agassiz’s further cross-referencing of text with the accompanying specialist images then reveals only some with her name on the drawing (e.g. Pterichthys productus and Cheirolepis cummingiae), although careful re-examination of drawing style again recurrates those by their apparently
Table 1. Cross-comparing catalogues to collect provenance metadata yielding women collectors

<table>
<thead>
<tr>
<th>Genus and species</th>
<th>Locality</th>
<th>Agassiz (1844) ‘Tableau synoptique’</th>
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<tbody>
<tr>
<td><strong>Formation: All Old Reds</strong></td>
<td></td>
<td></td>
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<tr>
<td>p. 3 <em>Pterichthys cornutus</em></td>
<td>Lethen</td>
<td>(p. 125) <strong>CEPHALASPIDES</strong></td>
</tr>
<tr>
<td></td>
<td></td>
<td><em>PERTICHTHYS PRODUCTUS</em> Ag. – Agass. Monogr. du syst. dévon. Tab. 5</td>
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<tr>
<td></td>
<td></td>
<td>Lethen-Bar, Nairnshire</td>
</tr>
<tr>
<td>p. 3 <em>Pterichthys latus</em></td>
<td>Lethen</td>
<td>“ <strong>LATUS</strong> Ag. – Agass. Monogr. du syst. dévon. Tab. 3, figs 3 et 4. Lethen-Bar</td>
</tr>
<tr>
<td>p. 3 <em>Pterichthys productus</em></td>
<td>Lethen</td>
<td>“ <strong>CORNUTUS</strong> Ag. – Agass. Monogr. du syst. dévon. Tab. 2. Lethen-Bar</td>
</tr>
<tr>
<td>p. 1 <em>Coccosteus oblongus</em></td>
<td>Lethen</td>
<td>“ <strong>MAXIMUS</strong> Ag. – Agass. Monogr. du syst. dévon. Tab. 11, Tab. 30a, fig. 2. Lethen-Bar</td>
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<tr>
<td>p. 1 <em>Cheiracanthus microlepidotus</em></td>
<td>Lethen</td>
<td><strong>ACANTHODII</strong></td>
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<td>p. 1 <em>Diplacanthus longispinus</em></td>
<td>Lethen</td>
<td><em>DIPTERINI</em></td>
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<td>p. 1 <em>Diplacanthus striatus</em></td>
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<td>p. 1 <em>Cheirolepis Cummingiae</em></td>
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<td>p. 2 <em>Osteolepis major</em></td>
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<td>p. 1 <em>Diplopterus macrocephalus</em></td>
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<td>p. 2 <em>Glyptolepis leptopterus</em></td>
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‘anonymous’ originator(s) to Eliza Gordon Cumming and her daughter, Seymour.

Lady Gordon Cumming is therefore no decorative, supporting (secondary) illustrator or donor (Buckland 1842) of ‘eminent’ geology as variously undertaken in its formative period by the owner-collector William Cole Earl of Enniskillen, Geological Society President William Buckland or world authority Louis Agassiz. None could have made his public reputation without the fundamental specialist collecting work and publications in palaeoichthyology of the ‘Old Red’ of ‘secondary’ men of national importance, such as (Mr) Hugh Miller and the Drs Fleming, Malcolmson and Traill, or without principal, and principled, women like Lady Gordon Cumming unstintingly sharing her expert geological knowledge through donation of type specimens and specialist illustrations. Indeed, without her work Agassiz could not have published new descriptions in the 1844 *Monographie* that define key genera in what science today recognizes as evolutionary fish biology. If she alone of his major informants could not publish her geology in her own name, she did the better thing as a serious collector for the futures of international geology. Her Humboldtian expertise in the dissemination of her collections and her specialist drawings of them to all known international, as well as national, experts in her field furthered the reach and significance of her work for new discoveries, and their identification, in other regions of the globe.

Agassiz’s ‘Tableau synoptique’ in Table 1 therefore further attests to Lady Gordon Cumming’s seminal collecting as a benchmark for all further comparative studies of the *Dipterini* and *Coelacanthi*. Similar findings by Sir Roderick Murchison (1792–1871) and Count Alexander von Keyserling (1815–91) – collocating with ‘St-Petersburg’ and...
'Printschka' in the synopsis – complement those at 'Kokenhusen' by General the Baron de Löwenstern (1776–1858) (Agassiz 1844, p. 138). The primacy of the 'Lethen-Bar' discoveries, therefore, like their geology collector can only be more fully accounted for when their subject-defining place is fully named, recognized and relabelled for itself, and for its implications in others' private, national and international collections. Eliza is no ‘poor Lady Cumming Gordon [sic] who was to say ‘I am so envied for we live upon the beds of fossil fish’” (letter from Charlotte Murchison to Lady Morgan, 22 September 1858 quoted in Collie and Diemer 1995, p. 15). Her premature death could not detract from her acclaim by Agassiz and others as a ‘foremost’ agent to assure the international reach and renown of this (and her) geology.

Uncovering the international case of Eliza Gordon Cumming’s work in palaeoichthyology in Britain and in France in the 1840s should not, however, make of her some unique female ‘phenomenon’ requiring rescue for the history of British ‘gentleman’ or French ‘Museum’ geology. Her Scottish Enlightenment collecting pursuits – in botany and other fields, as well as in palaeoichthyology – more seamlessly rediscover her shared histories of expert field collecting with European women’s transnational scientific practices. Their no less expert scientific role, status and pioneering collecting work, including teaching of other women, then needs more formal recognition and status to spearhead serious onward collecting of other expert women collectors in pre-twentieth-century geology. Eliza Gordon Cumming’s premier collecting and collections supremely qualify her as a ‘cabinétière’, the term coined by Adeline Gargam (2009) for expert female collector-practitioners in late eighteenth-century France who were curating major anatomy collections. Although they could not be called ‘anatomists’, these women owners of ‘cabinet-laboratories’, as opposed to cabinets of curiosities for social display, enjoyed a specialist status endorsed by the visits and consultations for expert advice by their male ‘anatomist’ peers, who alone enjoyed official status and qualifications. The private correspondence of one or other party (or mutual friends and peers) reveals the record for Gargam’s study of collaborative exchanges between equals in expertise but not official status. The correspondence of these cabinétières also provides evidence that they were the main conduit of inspiration and expert instruction for other women of their social circles with similar scientific interests. As a status and model for expert female scientific comportment and contribution, the term cabinétière provides a more suitably transnational, professionalizing, label to disambiguate ‘woman fossil collectors’ in the main science vernacular of Lady Gordon Cumming’s day, and so encourage the pooling of other women at the forefront of their scientific field who were given only glancing mention in the work of (gentleman) geologist peers of the period or, indeed, in the recent history of geology. To cite one case, there is the intriguing ‘Mrs Smith’s Collection (1878) – a lady living in Tunbridge Wells, 248 complete specimens and about 130 fragments’ (Smith 2016, cited on p. 64 without further exploration) forming part of the Natural History Museum Fossil Fish Collection before it acquired the extensive Enniskillen and Egerton collections.

Conclusions

To celebrate the 100th anniversary of the first women Fellows of the Geological Society of London on 21 May 2019, a different oral version of this chapter undertook to name, recognize and differently curate Lady Eliza Gordon Cumming by returning to the Society a quotation from its report of 1842 by William Buckland of her major contributions to (British) geology, and a translation into English of Agassiz’s acknowledgements in print in 1844 of her ‘foremost’ case (collections and collector). My further work on his Monographie (Agassiz 1844) has unpacked behind these the even greater international significance of Agassiz’s acknowledgements of Lady Gordon Cumming as his major type-specimen collector. National and international recollecting of her is not enough, however, in the Society’s conservation of its Agassiz collections (see https://www.geolsoc.org.uk/Library-and-Information-Services/Exhibitions/Louis-Agassiz-Fossil-Fish), or in the history and roles of women in pre-twentieth-century geology. As argued in this chapter, to open the international case of Lady Gordon Cumming as an expert cabinétière is to overturn everywhere the unquestioned attributing of discovery work in geology in its formative period to men only, or if, theoretically, also to women then only in token, secondary or domestic capacities. To take seriously the primary women in pre-twentieth-century geology, such as Lady Gordon Cumming, for the ground-breaking roles they played, it is necessary to draw some serious conclusions to direct future work on women’s history-making in geology.

First is the importance of international frames of reference for recalibrating national narratives of (women’s) discovery. Although Creese (2007) sets out the responsibility of reclassifying women such as Lady Gordon Cumming as ‘fossil hunters’, the label denies such figures the quality of the ‘serious’ investigative work involved in their fossil collecting. This chapter calls for the rewriting of women’s greater place, status and stature within geology through a greater contextual understanding of women’s cultures of collecting in science as cabinétières.
engaged at the forefront of particular specialist fields and their international networks.

Second, there can therefore be no benign, or accidental, omission and suppression of women’s endeavours in geology when major expert parties – such as the Earl of Enniskillen, Buckland, Murchison and Agassiz – all knew that the others had also been the direct beneficiaries of Lady Gordon Cumming’s immense scientific generosity and collecting expertise. Each variously credited his own position and authority by, respectively, ignoring, downplaying, side-lining or overwriting hers because of her known importance as their qualified equal or, indeed, superior in knowledge. This chapter argues that such ‘minor’ credits to women in acknowledgements, footnotes and other reference matter in the work of key men can now paradoxically serve as major alerts for informed modern readers. These alerts signal where to restore to the history of the sciences, including its feminist historiography, the many undue debits in (inter)national accounting of women’s major geological endeavours. The unconscious biases that determine ‘serious’ science in every era derive from sociocultural assumptions and beliefs concerning the gender, and also the class and nationality, of the authority and status of scientific knowledge.

Third is the related status of the women collectors and their collections as ‘secondary’ to the more important ‘publication’ work in geology of classification and description. Comparing the collections of the Earl of Enniskillen and Lady Gordon Cumming and their status as collectors in this chapter not only highlights why collectors should be treated more equally by gender in the period but also by the quality of their science informing it. The term ‘cabinetière’ has the necessary gravitas as a term for an expert woman collector of international standing who cannot be viewed as a less important woman collector.

Finally, multilingual archive work as undertaken above reveals a trove of significant material that calls for different collecting and curating practices. Table 1 illuminates Figure 1 as a record of the original provenance of the Natural History Museum’s Enniskillen and Egerton collections. It is then possible not only to reconnect the discoveries from ‘Lethen’ to their first discoverer but also to bring Lady Gordon Cumming’s work at the forefront of palaeoichthyology to public view and rightful prominence, including through recreating museum labels and display case information. Thanks to Agassiz’s published ‘metadata’ (foreword, descriptions, drawings, synoptic tables and index of species), ‘their’ specimens can be displayed as Lady Gordon Cumming’s first. Rightful provenance and prominence will also mean returning to the Geological Society of London, among other similar national bodies, the report by Buckland in 1842 on Lady Gordon Cumming. Had she been Lord Cumming, she would have immediately been made a Fellow. Her premature death robbed British and international geology of a foremost model of geological patronage, as well as ‘matronage’ (Strobel 2005–06). Her unerring devotion to serious geology in Humboldtian collecting mode through her extensive curation and widest international expert dissemination is also a cameo of best practice in the science of geology irrespective of sex. Generosity rather than rivalry also guarantees science the longer posterity that promotes the work of peers in the field and the training of women as disciples. In mentoring her daughter, Lady Gordon Cumming knew exactly what, how and also why to draw in order to inscribe their names indelibly into the history of geology, despite the male-dominated publications and reports produced by official Fellows. So, in 2019, we can restore and recurate Lady Gordon Cumming to her rightful place as a foremost woman collector and as an ‘unofficial’ Fellow of the Geological Society of London, along with many similar overdue honours and international accolades that make her a touchstone for women’s primary roles in geology.

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