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A Centenary Celebration of the First Female Fellows of the London Geological Society

Female aristocrats in the Natural History world before the establishment of the GSL

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Fascination with natural history does not recognize class, as is shown through the activities of female aristocrats who, during the 18th and 19th centuries, contributed significantly by increasing the number of collections at natural history museums. These women were not members of the Geological Society of London because, at that time, women were not even allowed to be members, but they still left their impressive legacy in museums. This manuscript will focus on three women who made extensive collections that are now incorporated into British museums. The first of these, the Duchess of Portland, made one of the finest collections in England and possibly the best collection of shells and fossils in Europe of her time, which was later acquired by the Natural History Museum, London. She was followed by the Countess of Aylesford who made one of the most important mineral collections of her time which is now at the Natural History Museum, London. Finally, Baroness Brassey collected geological samples during her trips that were used to establish the Brassey Institute in Hastings. These three women used their own income and influence to build collections.

Even before the Geological Society of London (GSL) was founded in 1807, there were women who were fascinated by natural history. They were keen naturalists with knowledge that they applied to building scientific collections, which were curated by themselves or by curators hired by them to do it. Their collections are important not only because of their history, but they also contain types which are the first specimens described of their species. These female collectors knew of the importance of scientific collections and could discern between attractive and important specimens. They built significant collections, paying for specimens or supporting scientific expeditions to remote places of the time, such as Sierra Leone. This paper brings to life some of those female collectors of the 18th and 19th centuries whose collections form part of the core material of present-day museums, collectors who contributed to enlarging natural history museums. Although they were not permitted to join societies, such as the Royal Society of London (founded in 1660) as was the case in the Duchess of Portland and Countess of Aylesford's time or the GSL during Baroness

Brassey's time, to exchange ideas and learn about the most recent scientific advances, they built, curated and exhibited collections their own way. The collections allowed them to create their own scientific network where they would contact contemporary researchers. We will recognise their work and their legacy, and for the purpose of this monograph will try to highlight in particular their geological samples such as minerals and fossils. The Duchess of Portland and Baroness Brassey did not distinguish between fossil and extant specimens and we could not quantify with any precision the percentage of fossils that formed their collections.

Margaret Cavendish Bentinck, Duchess of Portland (1715-1785)

Biography

Lady Margaret Harley [Figure 1] was born into a wealthy London family in 1715. She was the only surviving child of Edward Harley, 2nd Earl of Oxford (1689-1741), and his wife Lady Henrietta (née Cavendish Holles, 1694-1755) and granddaughter of John Holles, 3rd Duke of Newcastle-upon-Tyne (1662-1711) through her mother's side. Although Margaret grew up in a very literate environment, from an early age she started collecting natural history specimens, mainly shells, encouraged by her father and her grandparents (Clark, 2017). She married William Bentinck FRS, 2nd Duke of Portland (1709-1762) in 1734, joining the Newcastle and Cavendish estates to the Portland descendent line. This made her the wealthiest woman in Britain of her time. Undoubtedly, she used her position, her friendships and her money to build her collection and curate it. We do not know whether the money was allocated as pin money or the husband tolerated her using his money to build her collection. The Duke was also interested in natural history and would help her to collect specimens increasing her collection (Delany & Hall Llanover, 1861). Amongst Margaret's descendants is Queen Elizabeth II, who is her great-great-great-great granddaughter.

Figure 1. Portrait of Portland, in oil, c.1744, by Thomas Hudson. The Portland Collection, Harley Gallery, Welbeck Estate, Nottinghamshire. © Bridgeman Images.

The Duchess of Portland was considered a fair-minded and sweet-natured woman (Bowden, 1989) and was involved in many activities. She joined the Bluestockings group to which her friends, one of the founders Elizabeth Montagu (née Robinson) (1718 – 1800) and Mary Delany (1700 –1788), also belonged. This was an informal society founded in the 1750s as a discussion group, mainly for female intellectuals with artistic, literary, and scholarly ambitions under the patronage of Queen Charlotte (Puyear, 2014). This was a very advanced step at a time when women were more known for non-intellectual activities. She was also involved in philanthropic causes such as the establishment of the Foundling Hospital, founded in 1739 for orphans and abandoned children by Captain Thomas Coram (1668-1751).

The Duchess was a very sociable lady and her collection allowed her to contact interesting people, such as taxonomists, naturalists and many Fellows of the Royal Society (Clark, 2017). It was most likely her husband who introduced her to fellows of the Royal Society (FRS), as he himself was a fellow from 1739 and also a trustee of the British Museum. The couple had many interesting visitors to their house, including politicians, explorers, botanists, gardeners, artists, actors, writers, church dignitaries and members of the royal family, and where nature was often discussed. At the age of 71, on the 17th of July 1785, she died at Bulstrode after a short illness. In her will it was stated that she wished her children to sell her collections.

Her collections

From a very young age Margaret had an avid interest in natural history and started to gather what was one of the largest collections in Britain of her time, competing with that of Sir Hans Sloane (1660-1753), the founder of the British Museum. This special interest and her position allowed her to give full rein to her pursuit of collecting; at her house at Bulstrode Park, Buckinghamshire she had a museum, an aviary, a menagerie and several botanic gardens. Her residence was known as “The Hive” for the intensive work done by her and her team of curators. Her interests covered fossil and recent botanical, malacological and coral specimens and minerals also. She not only collected, but also curated her collection with help of hired curators. Amongst these curators were the Swedish botanist and malacologist Daniel Solander (1733-1782), a pupil of Carl Linnaeus, and the naturalist Reverend John Lightfoot (1735-1788) who tried to help her determine and describe all known species at the time. Solander’s sudden death did not allow him to complete the task for which he was hired, frustrating her aspirations of having a representative specimen of each mollusc species in her collections described. The catalogue of her collections (Lightfoot, 1786) includes species names that have been mostly respected, acknowledging Lightfoot as species author (Rehder, 1967). This catalogue embraces geological samples such as fossils, minerals and rocks. Fossil and extant taxa were studied together at that time as has become usual again nowadays in evolutionary studies. In the catalogue the fossils are called ‘petrifications’ and contain molluscs of all classes (many ammonites), echinoderms, arthropods (insects in copal), cnidarians (numerous corals), few annelids, fishes and bird nests. The Duchess of Portland’s knowledge was recognised by her curators. Lightfoot (*Bowden, 1989: p. 10*) wrote about the Duchess’s ability with identifications, including new species. During the Enlightenment there was a concern with object interpretation and how the objects were systematically represented (Lord, 2005). It was a time of collecting and methodical classification and when prolific collectors would appear around Europe. The contemporary historian Horace Walpole (1717-1797) wrote about her: “*Few men have rivalled Margaret Cavendish... in the mania of collecting, and perhaps no woman. In an age of great collectors*

she rivalled the greatest' (Walpole, 1936). Her fortune and interest allowed her to assemble a unique contemporary collection, at a time when women had to have a pioneering spirit (Burek & Higgs, 2007) because society as a whole did not support the ambitions of women to follow their scientific interests.

Figure 2. Distribution of Duchess of Portland natural history collection. The fish, birds and entomological specimens include fossils. © The Natural History Museum, London, under CC-BY.

In her friendship circle there were experts in each speciality. Some of the botanists were Philip Miller (1691-1771), Sir Joseph Banks (1743 – 1820), the botanical illustrator Georg Dionysius Ehret (1708-1770), and her gardener Thomas Agnew (fl. 1780s). The Welsh naturalist Thomas Pennant (1726 –1798) was also included in her group of friends, with whom she would exchange specimens and letters. The exchanged specimens would include fossils and minerals and Pennant made a large collection that is currently at the Natural History Museum, London (NHM).

Her collections [Figure 2] were distributed in six groups (Lightfoot, 1786) and they add up to more than 30,000 natural history specimens. These were: (1) fossils and extant molluscs, cnidarians, echinoderms and crustaceans with 2247 lots; (2) minerals with 538 lots; (3) birds with 49 lots (with fossil nests); (4) fish with 8 lots (including fossils); (5) botanical specimens with 29 lots; and (6) entomological specimens with 376 lots (including fossil insects in copal).

Her collection was compiled from the specimens she collected doing 'fieldwork' as well as those she bought and was given. Working locally was the normal procedure of the early female geologists/naturalists (Burek & Kölbl-Ebert, 2007). She also exchanged specimens with other collectors, but never travelled abroad, and therefore most of her foreign collection was either given or bought.

Very little is known about her fossils or minerals *per se* except for some comments in letters and her own *Portland Catalogue*. She is mainly remembered for her shells (Whitehead, 1969), which include fossil and extant species, and several papers and books have been published on these. The Duchess's interest in shells is recorded in letters that she exchanged with naturalists such as John Ellis (1710-1776). Ellis sent her not only shell pictures and shell specimens, but also introduced her to other naturalists such as the Norwegian malacologist the Right Rev. Erich Pontoppidan (1698-1764), one of the many who benefitted from her patronage (Smith, 1821). Some of her shells were bought from George Humphrey (1739-1826) (Whitehead, 1969), Solander or Banks who all acquired the shells from Captain Cook's voyages or from Henry Smeathman (1742-1786) after his expedition to Sierra Leone, which had been funded by her as were some trips made by Thomas Shaw FRS (1694–1751).

Her collections were very popular during her time and had no geographical limits. The naturalist Peter Collison FRS (1693-1768) wrote to Carl Linnaeus in 1765 that the Duchess had excellent collections of marine invertebrates and minerals (Smith, 1821). But it is not only these latter collections that were admired; the drawings on natural history objects were also considered the finest collection in the British Isles (Dance, 1966; Hayden, 1980) and rivalled the best in Europe (Dance, 1966). Although there were other important collectors in her time such as Sir Hans Sloane, the Duchess's Collection could not only compete with the Sloane Collection but she was also noted as a discerning collector, writing in one of her letters about the indiscriminate collecting habits of Sloane (Whitehead, 1970). According to Walpole (1936) she may have spent as much as £15,000 on her natural history specimens, equivalent to almost £2,000,000 nowadays. The Gentleman's Magazine published in 1786 that the Duchess's entire collection was sold for £11,524.

Present whereabouts

Some of the Portland specimens were presented to the British Museum by the Duchess as the naturalist Johan Alströmer (1742-1786) recorded in personal letters (Whitehead, 1969). Once she had passed away in 1785, her descendants decided to sell her whole collection. Much has been written about this; the reason for this sale could have been the economic situation of the family (Dewes, 1940; Dance, 1962, 1966) or simply because she stipulated it in her will (Walpole, 1936) for the benefit of her second son and her daughters. It has also been speculated that the Duchess wanted to help her first son William's political career (Tobin, 2014; 2016). To sell her cabinets of curiosities, John Lightfoot, her curator, chaplain, librarian, an expert botanist and malacologist and long-term friend, prepared a sale catalogue (Lightfoot, 1786) with 4,156 lots, mainly natural history specimens, a useful resource to locate her specimens. Her collection was dispersed through the public auctions carried out at Whitehall in 1786, one year after her death, between the 24th April and the 3rd July. The sale was very successful and more than 100 buyers of the specimens were recorded in the sale catalogue (Lightfoot, 1786). Later, most of these buyers sold or donated their own collections to other collectors or museums where the Portland specimens can now be found. This is the main reason why nowadays the Portland Collection is dispersed through the collections of museums such as the NHM. We should not forget that some of her specimens were on loan at the time of her death to researchers such as Richard Pulteney (1730-1801) and the specimens could not have been returned (Tobin, 2014).

This catalogue with the buyers recorded is essential in tracing her collection specimens, particularly the geological ones, and helps to reinstate the Duchess's name into the history of science and of major scientific museum collections. The fact that the specimen names given by Lightfoot (1786) have been respected and acknowledged as the Duchess of Portland's specimens means that her collection includes numerous types.

Amongst the buyers of the Duchess's collections were Emanuel Mendes da Costa (1717–1791), Thomas Martyn (1735–1825), Ingham Foster (1725–1782), John Hunter (1728–1793), Thomas Sheldon (fl. 1780s), George Fordyce (1736–1802), Dru Drury (1724–1803), Thomas Pennant (1726–1798), George Walker (fl. 1780s), George Humphrey (1739–1826), Mr. Dillon (who bought on behalf of the Charles Alexandre de Calonne, Duke of Calonne, 1734–1802) (Tobin, 2014) and Daniel Boulter (1740–1802).

The NHM has at least four of the Duchess's mineral specimens (BM. 1923798 quartz from 'Hungary'; BM.1923,799 cinnabar from Germany; BM.1923,800 calcite from Saxony, Germany; and BM.1923,801 quartz from Brazil) [Figure 3A-C]. The minerals that the BM acquired before 1837 were incorporated in the General Register and some of her specimens may not have recorded information of the original owner. Her mineral collection was bought by 54 dealers and collectors whose names are essential in finding her mineral specimens in museums. Very little is written about this collection in the literature, therefore we mainly depend on the complete digitisation of all the information regarding the mineralogical specimens, at the NHM and other museums, to find out where the specimens are.

Figure 3. Connection between NHM Mineralogy Catalogue and Portland Catalogue numbers and minerals. A. & C. Quartz from Hungary and Brazil respectively. B. Calcite from Germany. © The Natural History Museum, London, under CC-BY.

Some of the donors and sellers of the Duchess's shells to museums were the physician and founder of the Hunterian Museum, William Hunter (1718–1783) (Whitehead, 1969), John Hunter's brother, who bequeathed his collection to the Glasgow museum named after him; Captain John Laskey (1760–1829), a soldier, dealer and collector who also donated some natural history collections to the Hunterian Museum and published the catalogue of the museum, citing Portland corals and molluscs in its collections (Laskey, 1813) and sending other Portland shells to George Montagu (1753–1815) (Oliver et al., 2017); the malacologist *Christian Hwass* (1731–1803) (Whitehead, 1970), the majority of whose collection is at the Muséum d'Histoire naturelle de Genève (Dance, 1971); the collector and statesman Charles Alexandre de Calonne, whose collection was also sold and dispersed in 1801, some specimens sold to the Earl of Tankerville (1743–1822) (Sowerby, 1825). Other specimens reached other collectors such as William Elford Leach (1791–1836) (Linnean Society Archives, 1815). To date at least nine extant shells have been traced with certainty. Part of the Portland Collection can be traced as coming from Tankerville (holotype of *Voluta aulica* Sowerby, 1825; Portland Catalogue lot number 4021) [Figure 4]; from Clayton Mordaunt Cracherode (1730–1799) (two syntypes of *Voluta virescens* Lightfoot, 1786; Portland Catalogue lot number 610) [Figure 4]; from Montagu (two syntypes of *Voluta bullaoides* Montagu, 1808; Portland Catalogue lot number 2487) (Oliver et al, 2017), a specimen of *Conus gloriamaris* Chemnitz, 1777, bought by William John Broderip (1789–

1859) from Tankerville through Mrs Maweand (Van der Feen-Van Benthem Jutting, 1949); these six are now at the NHM. Other shells include two *Polymita picta* (Born, 1778) at the Hunterian Museum (Tobin, 2014) and one *Voluta ponderosa* Lightfoot 1786 at the Museum of Comparative Zoology (Johnson, 1999; Nieburger & Baldinger, 2012). There are also probably some other fossil shells in the Solander Collection at the NHM.

Figure 4. Different views of Portland specimens. A-B. Syntype of *Voluta virescens* (NHMUK 20100617) from Coast of Guinea. C-D. Holotype of *Voluta ponderosa* (MCZ 249020). E-F. Holotype of *Voluta aulica* (NHMUK 1837.12.1.45), unknown locality. A-D share scale. A-B & E-F © The Natural History Museum, London, under CC-BY. C-D © Museum of Comparative Zoology and Harvard University.

Other sources that can help us to trace the Duchess's specimens are the drawings with representations of part of her botanical and malacological material kept in the NHM Archives. There we can see very realistic representations by Agnew & Portland (1781-1784) [Figure 5] and Lewin & Agnew (c. 1786-1818) which include some of her specimens, and the publications of contemporary naturalists (Martyn, 1784, 1789; Donovan, 1799, 1800, 1801, 1802, 1803) who brought specimens of her collection to dealers who attended the auction in order to sell them. Building her collection took her decades (Tobin, 2014), curating it took her many years and undoing it took only 39 days. The current digitisation that most museums are undertaking will help to locate her specimens and will incorporate her name into the list of females who made a difference in the history of science.

Figure 5. First page of the manuscript by Agnew & Portland with the Duchess's handwriting. © The Natural History Museum, London, under CC-BY.

Her contribution to science

Although the Duchess is recognised more for her title (Margaret Street in London, close to the Cavendish-Harley estate, is named after her) than her work on natural history, contemporary research is beginning to give her well-deserved recognition. She was not only a patroness but also a curator with knowledge of taxonomy, who created her own museum, hiring the right people to help her to curate specimens. She drew and recorded her specimens, classifying them with the most updated system of the time, *Systema Naturae*, or binomial nomenclature, of Linnaeus (Tobin, 2014). She was the leading patroness (Dance, 1962) of natural history in eighteenth-century Britain, a personality who made a landmark contribution to science and whose name is now assuming its place with other respected naturalists of her time. Her work in creating the most comprehensive collection on biodiversity, palaeobiodiversity and minerals allowed her to build a remarkable natural history collection, so much so that nowadays some of her specimens are considered type specimens. Her curated collections show a deep knowledge and she was a key naturalist of

the Enlightenment period. More research on her fossils and minerals will make her name stand out from other geological collectors in the history of museums and science.

Louisa Finch, Countess of Aylesford (1760-1832)

Biography

Lady Louisa Thynne [Figure 6] was born at Longleat in Wiltshire into a prosperous family in 1760. She was the fourth of eight children and the first daughter of Thomas Thynne (1st Marquess of Bath, 1734-1796) and Lady Elizabeth Cavendish-Bentinck (1735-1825) and was also granddaughter of Margaret Cavendish Bentinck, Duchess of Portland, on her mother's side. She married Heneage Finch, 4th Earl of Aylesford (1751 –1812) in 1781 and became Countess of Aylesford. Her husband supported her in building her collections, being a Fellow of the Royal Society (FRS) and a trustee of the British Museum from 1787. Her position and her husband's circle of friends were important in allowing her to build her collection and identify specimens.

Figure 6. Portrait of Aylesford, 1783, by Valentine Green, after Joshua Reynolds mezzotint. NPG D7453. © National Portrait Gallery under CC BY-NC-ND 3.0.

Louisa grew up in an intellectual environment with a grandmother who transmitted her love for nature to her and a father who was a founder member of the Linnean Society. From a very young age she felt attracted to botany and during her time at Great Packington in Warwickshire, she not only grew plants and conserved them in her herbarium but also drew them. Her attraction for plants was only surpassed by her passion for minerals and, although nothing has been written about this, minerals and rocks formed most of her collection. The fact she was attracted by minerals coincided with the interest shown by her grandmother, the Duchess of Portland, and other influential ladies of the Enlightenment period, although the Aylesford mineral collection surpassed that of her grandmother. She was recognised during her time as a significant collector of minerals.

Her character was renowned for being both charming and remarkable (Cadbury et al, 1971). She was known for her involvement in charities such as Lying-in Charity at Coleshill, near Birmingham, and also in scientific circles. Among her circle of naturalist colleagues were members of the Linnean Society such as James Sowerby (1757-1822) and members of the GSL such as the mineralogist Henry Heuland (1778-1856). These connections may have come from her husband in his role as an FRS and a trustee of the British Museum. Another aristocratic contemporary who exchanged specimens with her was Lady Henrietta Antonia Clive, Countess of Powis (1758-1830). All of them would be linked to her through their passion for minerals at a period of time when mineral classification began. She died at Great Packington, Warwickshire, in 1832 at age 72.

Her collections

The Countess of Aylesford's collections [Figure 7] can be divided into three different groups: (1) minerals, with almost 5500 specimens; (2) botanical specimens, including plants and fungi with almost 2000 objects; and (3) fossils with only 4 fossil fishes registered in a BM annual report.

The main part of her collection was formed of minerals that she acquired principally from dealers between 1810 and 1832, although there is little written about this. It is well known that she did not travel and her specimens, therefore, must have been obtained by other collectors, dealers and friends. Her two-volume catalogue [Figure 8] registers the donors, provenance, names and short descriptions of most of the specimens. The catalogue starts with a beryl in topaz rock from Siberia obtained at Mr De Cortés sale [*sic*] and the last specimen was recorded in 1882, the year she died; this was lead from Wanlockhead Mine, Scotland, number 5468 of her collection from 'G.S.' [probably George Sowerby (1788-1854)]. Other contributors to her mineral collection are James Sowerby, Heuland and 'Dadd' [probably Robert Dadd (1798-1843)].

There are records of mineral auctions attended by her, such as the numerous Heuland mineral auctions from 1820 to 1829 where she bought at least 30 lots, as can be seen in the catalogue kept at the NHM Archives (Heuland *et al.*, 1808-1848). She was a regular figure at these sales from 1815 to 1829 as is noted in both volumes of the Heuland catalogue, which also notes that she used to buy the most uncommon and exotic specimens. At that time Australian specimens were particularly appreciated and she bought a 'matchless crystal of white transparent tredecioctonal topaz from New Holland' for which she paid £5.15 in 1829 (Vallance, 1980), the equivalent to almost £600 nowadays. This indicates her knowledge of mineralogy, buying the most perfect structures. Some of her specimens were recognised as new mineral species and published during her lifetime, such as Levy's (1826) description of *Königine*, a species of copper subsulphate, which he devoted to Charles König (1813–1851), the Keeper of Geology at the BM.

Figure 7. Distribution of Countess of Aylesford natural history collection. © The Natural History Museum, London, under CC-BY.

She also made loans of minerals to naturalists. Sowerby (1817) cited numerous specimens that he used to illustrate minerals such as *Yenite*, *Spinel*, *Gieseckite* which are type specimens. This highlights the importance of her collection as having not only historical and economic value but also scientific value.

Figure 8. Cover (left) and first page (right) of a copy of an earlier *Catalogue of Minerals* by the Countess with donor, mineral name, description and origin of the specimen. © The Natural History Museum, London, under CC-BY.

Although minerals form the main part of her collection, her other passion was botany. Her work on botany was widely cited in a contemporary botanical guide of England (Turner &

Dillwyn, 1805). She wrote a *Catalogue of British plants, including ferns, mosses, funguses & sea weeds, &c.* in two volumes citing sites, collectors and dates of the corresponding drawings (Aylesford, 1784-1816) now preserved in the NHM Archives.

In her collections were also fossils, but unfortunately nothing is recorded with certainty. According to the British Museum (Natural History) annual reports of 1904, the Countess donated four fossil fish of *Dapedius orbis* Agassiz from the Lower Lias of Barrow-on-Soar, Leicestershire (England) in 1817, although the NHM catalogues do not have any record of these specimens.

Present whereabouts

During her life she donated some specimens to museums, but most of her collections were sold after her death in 1832, as was also the case with the Duchess of Portland's collection. Currently her specimens are distributed among at least four institutions (NHM, Oxford University, Yale Center of British Arts and Amherst College). The main part of the mineral collection passed to Heuland, a mineral dealer of London, who organised an auction over several days to sell the "Late Dowager Countess Aylesford's minerals" in 1834. It is during this auction that the BM trustees made a selection of the best of her specimens and bought them (Smith, 1969) and later, in subsequent years from 1835-1839, more Aylesford minerals from Heuland entered the NHM. Other buyers of the Aylesford mineral collection were Isaac Walker (1794-1853) and John Crace Stevens (1809-1859); tracing their collections will help to locate the Aylesford mineral collection. Additional Aylesford minerals entered the BM from Frederik Noel Ashcroft (1878-1949), Arthur Russell (1878-1964) and James Robert Campbell (c. 1802–1861). 58 specimens clearly registered as Aylesford minerals are at the NHM [Figure 9], only a fraction of her original collection. Some of her minerals, as with the Duchess of Portland, may not have information of the original owner (the case with minerals acquired before 1837) making it more difficult to trace her specimens as they were incorporated into main collections. The Countess described her minerals in a two-volume manuscript kept at the NHM [Figure 8], a crucial document to help trace the specimens. Other mineralogical samples that may have belonged to the Countess are those presented by her son, the 5th Earl of Aylesford (1786-1859), which entered the NHM in 1845 and 1846. Amherst College (Massachusetts, USA) houses some of her minerals; some of these are specimens of chrysoberyl and topaz from Minas Gerais, Brazil, which were on display there in The Shepard Cabinet (Amherst College, 1848).

Figure 9. Association between the gold specimen from Le Gardette, France, the NHM Mineralogy Catalogue (87489) above and the Heuland Catalogue (544) information below. © The Natural History Museum, London, under CC-BY.

Her herbarium was complemented with her drawings, in 29 volumes, which achieved a high standard of accuracy and are a good reference for those specimens distributed in

collections at various institutions. The NHM keeps two of these volumes with cryptogams; others were sold in private auctions at Christie's in 1888. Later, lichen drawings were sold at Sotheby's in 1971 and two volumes with fungi (from between 1792 and 1797) sold there in 2002.

Four specimens of *Dapedius orbis* Agassiz, 1836 from the Lower Lias of Barrow-on-Soar, Leicestershire (England), have been located in the Fossil Fish Collection at the NHM [Figure 10], but unfortunately, they say 'History unrecorded'. As they come from the same strata and site as those specimens donated by Aylesford in 1817 and also considering that there are very few specimens of this species in the collections, as well as the fact that these specimens are the only ones saying 'history unrecorded', we can assume that these spectacular specimens are part of her original collection.

Currently more and more bibliographical references are being scanned that will help to reveal citations of the Aylesford specimens and where they are housed. The future digitisation of all important, relevant bibliographical references together with information on the museum specimens will help with identifying which specimens originally belonged to Aylesford.

Figure 10. *Dapedius orbis* (NHMUK PV P7423) from Lower Jurassic of Barrow-on-Soar, Leicestershire. © The Natural History Museum, London, under CC-BY.

Her contribution to science

The Countess of Aylesford deserves to have recognition in the geological world due to her mineral collection. Her mineral catalogue, where she so carefully recorded mineral names and their provenance, is a useful resource in tracing her specimens, many of them being the first of those mineral species to be collected and considered types. Her catalogue mostly gives brief mineral descriptions and in addition the same specimen number that is affixed to the mineral. This means she was aware of the importance of specimen data. She bought the most uncommon specimens with the most perfect structures, leaving as a legacy very striking specimens with data associated in British collections.

Another major part of her legacy is her very well documented flora of Warwickshire at the beginning of the 19th century, a record seen as very useful for climate change studies. Readett *et al.* (1965) and Laflin (1965) recognised that some species recorded by the Countess were not present by 1965. Her collections were very well curated, with specimens classified, named using binomial nomenclature, and sites recorded. She showed a deep knowledge of taxonomy that was recognised in her time.

Anna Brassey, Baroness Brassey (1839-1887)

Biography

Anna Allnut [more commonly known as Annie] [Figure 11] was born into a wealthy family in the south of London in 1839. Although she had no aristocratic connection, her family was very well recognised by its fortune made with the wine trade. She was the only child of John Allnutt (1803-1881) and his wife Elizabeth Harriet Burnett (1819–1843). She spent her childhood at her grandparents' house in Clapham, London, surrounded by paintings, books and nature. Her grandfather was an art collector and an important patron of painters such as Turner and Constable.

She married Thomas Brassey II (1836-1918), son of the famous Victorian railway contractor, in 1860 when he started his political career, and would become a big supporter for her husband who became MP for Hastings in 1868 (Devenish, 1974). His position led to her having a very social life and being involved in charities such as St John's Ambulance (Clark et al., 2018) of which she was one of the most energetic members. They started married life with the elder Thomas Brassey at Beauport Park, a large residential Hastings house which is now a hotel. From there they helped plan their new residence, Normanhurst Court (1865-1951) at Catsfield, Sussex, which was also to house Annie's collections. They alternated their Catsfield residence with their London one at 24 Park Lane, where the present Hilton Hotel is situated, and also an apartment in Hastings in the Brassey Institute which they built in 1879 and where the Hastings Museum would later begin. Normanhurst Court was described as a building which would make a perfect museum. 24 Park Lane was defined as the most aristocratic spot in London of the time (Griffith, 1894) and as a place desirable for its unique collection. She would become Lady Brassey in 1881 and Baroness Brassey of Bulkeley in 1886 (Devenish, 1988).

Baroness Brassey was a fascinating personality in her own right. She was a strong and curious woman which led her to travel and to gaining more knowledge about other cultures. She was described as one of the most adventurous and agreeable of lady-voyagers (Davenport Adams, 1903) and was popular for the meetings with naturalists and artists she organised at her house. Her love for nature and adventures made her books and collections well-known throughout the world and her contacts, personality and influence helped her to build her collection. Although her name is not recorded on the list of fellows of the Zoological Society of London (ZSL), her donations after September 1869 have her name followed by FZS, the ZSL being one of the first societies to admit women. Her books (Brassey, 1878, 1880a, 1880b, 1882, 1885a, 1889) were not scientific, but on her trips aboard the yacht Sunbeam she wrote about her curiosity for volcanoes, the landscape and geological samples. She would eventually die of malaria in Brisbane in 1887 during her trip to Australia and was buried at sea.

Figure 11. Portrait of Brassey in oil, 1864, by Francis Grant, animals by Edwin Landseer. © Hastings Museum and Art Gallery.

Her collections

Baroness Brassey's natural history collections were also made mainly during her trips on the *Sunbeam* (1876-1877 and 1886-1887) or bought from dealers, mostly abroad. The fossil and extant marine invertebrate specimens stand out above the other collections as they comprise numerous exotic specimens. There are four groups of natural history collections [Figure 12]: (1) fossils, molluscs, cnidarians, echinoderms and sponges with 724 lots; (2) minerals with 156 lots; (3) vertebrates, mainly stuffed birds, with 48 specimens (probably belonging to the same lot); (3) and botanical specimens including only 2 lots of seeds recorded in her catalogue of 1885 (Wright, 1885).

Figure 12. Distribution of Baroness Brassey's natural history collection. © The Natural History Museum, London, under CC-BY.

During her time three principal publications listed her collections (Maskell, 1878; Wright, 1883; Wright, 1885) with about 1000 lots of natural history specimens excluding taxidermy and dried plants. This figure is definitely lower than it should be, as the register catalogues at Hastings Museum & Art Gallery show a figure almost twice that. These catalogues record the register number, description of the specimen, site, location where the specimen was displayed, a classification code and notes for each specimen. She not only wrote books on her trips, but also wrote on her collections, such as a catalogue of the objects displayed by the St John Ambulance Association (Brassey, 1885b). Her coral and mineral collections were very well recognised in publications of her time (Baedeker, 1908). She had at least 602 fossils and 10 dinosaur replicas which are now at the Bexhill Museum.

It seems her early years were devoted to the study of botany but she would change to geology in her later years, mainly after 1873 when the Geological Section of the British Association visited Normanhurst Court (Porter, 1995), a visit that undoubtedly left an impression on her. From then onwards her geological collections start to have more relevance in her catalogues. Some of these collections came from her father-in-law Thomas Brassey (1805-1870), a railway contractor who built a large part of the railway systems of the time in England, France, Italy, Spain, Denmark, Eastern Europe, India and Argentina (Devenish, 1974), the collections including specimens collected at railway cuttings [Figure 13].

Figure 13. Cover of the Bexhill Museum Catalogue of the Lady Brassey fossils and the information about the specimen F502 of *Schloenbachia varians* from Lower Cretaceous of Buriton Tunnel, Hampshire, England. © Bexhill Museum, under CC BY.

The Bexhill Museum documentation registers the establishment of her geological collection from about 1875. One of her catalogues (Maskell, 1878) records Hawaiian lava collected by her on the trip she made between 1876 and 1877. She also collected

geological specimens on her first trip aboard the Sunbeam in 1876 such as obsidian from Tenerife, Canary Islands [Figure 14]. Other additions came between 1878 and 1881 (Porter, 1995), as recognised by Wright's label handwriting. Her fascination for geology visibly increased as the number of specimens in her geological collections grew. She also bought specimens from one of the greatest dealers in minerals of the time, Bryce McMurdo Wright Jr (1850-1895,) and also from a very active fossil dealer and curator at the Museum of the Yorkshire Philosophical Society and Ipswich Museum, Edward Charlesworth (1813-1893). It was Wright who described the new coral taxa (*Distichopora brasseyi*, *D. allnutti* and *Brasseyia radians*) dedicated to her and his polemic publication (Wright, 1882) was followed by three papers in Nature in 1883; the first two species above were considered synonyms with *Distichopora nitida* and the third one included in the genus *Dendrophyllia*. Charlesworth provided Brassey with most of her Crag specimens [Figure 15]. In these collections there are also dinosaur bone replicas that were bought from James Tennant (1808-1881), Professor of Geology at King's College, London, and a mineral dealer, who proposed the creation of dinosaur replicas based on the Crystal Palace reconstructions and sold them. Brassey also supported excavations in order to collect specimens, such as one in Cyprus in 1884 (Porter, 1995). The Geological Survey of Victoria (probably Australia) has recorded sandstone samples and fossil brachiopods donated by her (Gregory, 1902). These collections would give her the opportunity for networking and to contact dealers and private collectors to increase her collections.

The geological collections, as with the natural history collections, had the specimens identified taxonomically and she was familiar with the binomial classification of her time. These collections were only displayed at Normanhurst Court, but never in temporary exhibitions or in the Lady Brassey Museum that was established in the 1890s.

Figure 14. Obsidian (BEXHM 2019.68) collected by Brassey at Mount Teide, Canaries, on 22 July 1876. On the right the original label and on the left a page of her book (Brassey, 1881) citing the collection of the specimen and also the corresponding page of the Brassey Museum Catalogue (Maskell, 1878) for specimen 365. © Bexhill Museum, under CC BY.

Figure 15. Correlation between specimens, the Bexhill Museum Catalogue in the centre and the Brassey Museum Catalogue (Maskell, 1878) on the right. A. *Trochus ziziphinus* (F41.17 at Bexhill Museum and 37 in the Brassey Museum Catalogue) from Coralline Crag, Pliocene, of Woodbridge, Suffolk (England). B. Nummulites from Eocene of Egypt (F147 at Bexhill Museum and 99 in the Brassey Museum Catalogue). © Bexhill Museum, under CC BY.

Present whereabouts

Once Baroness Brassey had died in 1887, her *collections of natural history material were displayed at her husband's London house until his death*, after which their son Thomas bequeathed most of her collections to the *Hastings Corporation in 1919* (Devenish, 1974). These collections would be the establishment of the Brassey Institute. Currently the Hastings Museum & Art Gallery keeps a few geological specimens (Catherine Harvey, pers. com.) as is recorded in its inventory from 1920; we can highlight a 'quiver stone' (sample of bending sandstone). Most of The Brassey natural history collections, including those specimens exhibited at Normanhurst Court, are at present housed in the Bexhill Museum where they were presented mainly in 1920 (and one more piece in 1921) by Lady Mabelle Egerton, the eldest of Brassey's daughters. These specimens were packed away for about 60 years until the building suffered leaks in the 1980s (Knell, 2002) and were later merged with the main collections. It is estimated that only one third of all her collections have survived (Porter, 1995). The Brassey Collection at Bexhill Museum contains mainly the natural history specimens, mostly geological samples, which were on display at Normanhurst Court. This has been cross-checked by Porter (1995), matching the specimen information and the catalogue published by Maskell (1878). Currently 505 fossils and probably a total of 156 minerals and rock samples have been identified as belonging to her collections at the Bexhill Museum. Most of them were mounted on card and had the label onto which the taxonomic name and site were recorded. It is clear that Baroness Brassey understood the value of scientific specimen data and she worked with specialists to identify specimens. The remainder of her collections, without natural history specimens, were donated to Wolverhampton Museum, Leek Museum and the Huntington Library in San Marino, California. Over time these collections were redistributed through sales and exchanges and can now be found at Birmingham Museum and Art Gallery, the British Museum, Hastings Central Library and the East Sussex Records Office (Clark, et al., 2018).

Her contribution to science

Baroness Brassey was an educator through the use of her collections, these collections being open to the public at her house, on board the yacht *Sunbeam* and on display in exhibitions such as the International Fisheries Exhibition held in London in 1883 (Wright, 1883); there were other more specific exhibitions on her collections in Swansea in 1883 and Penzance in 1884 (Porter, 1995). She left an important legacy of specimens collected from places that currently have very restrictive laws regarding collection and export of specimens, such as Venezuela, Argentina, Malawi, Turkey and Spain, and these specimens therefore are important for research. Her collections were very well curated, systematically arranged with taxonomic identification and geographical details of provenance, useful data for research.

Conclusions

The three female collectors presented here have in common their interest in natural history, all having large collections, each with geological specimens amounting to more than half the collection. The three of them were educated and literate due to their wealthy positions and their enlightened families. They were successful in building these important collections as they were all enthusiasts of natural history, were hard-working and also had the good fortune to be able to collect and buy specimens and store them in their large houses for display. They pursued their dreams of having unique collections of the time which gave them the opportunity to create their own scientific networks as they could not participate in scientific societies. Their collections included geological samples such as fossil invertebrates and vertebrates, minerals and rocks, and they recognised the importance of specimen documentation and identification following binomial nomenclature. These collections include numerous important scientific specimens, such as the first specimens used to describe a new species, types, and others collected from sites where currently collecting is not permitted. They were also erudite in taxonomy and curated their collections themselves along with hired specialist curators to help them. They knew of the importance of specimen data as can be seen in their catalogues. Thanks to the detail of these catalogues, new technologies in digitisation will facilitate location of their specimens which in turn will contribute to our understanding of the role of women in scientific endeavours during 18th and 19th century.

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NHM Mineralogy Catalogue

1923, 794.	9.
<i>Chalcocyanite pseudomorphous after Chalcopyrite.</i> crust of coated crystals. Hüttenberg, Carinthia, Austria.	Specimens from the Collection of the British Museum Natural History (1838-1842)
795. <i>Stannite pseudomorphous after Chalcopyrite.</i> with adherent hydrothermalite & sand. "Freiwaldung" [Hüttenberg-Löfing district], Carinthia.	By August 20 July 1923.
796. <i>Chalcocyanite pseudomorphous after Chalcopyrite.</i> with blue coating. "Freiwaldung" [Hüttenberg-Löfing district], Carinthia.	
797. <i>Wargentin's</i> divergent groups of crystals which form in diamonds. "Freiwaldung" [Hüttenberg-Löfing district], Carinthia.	
798. <i>Quartz</i> (Acute crystals), reddish, strongly translucent, crystal 11 x 9 mm., with shelly granule. "Hungary."	Portland Feb. 1904. Lot 247.
799. <i>Cinnabar</i> , consists of minute crystals on and in Braunerite crystals; with Pyrite. Wolfsberg, Rhénish Prussia.	Portland Feb. 1904. Lot 248.
800. <i>Calcite</i> , cluster of spiky crystals reddish tinge. Saxony.	Portland Feb. 1904. Lot 249.
801. <i>Quartz</i> , "Brazilian pebbles" black pebbles with prismatic columns from internal cracks. Brazil.	Portland Feb. 1904. Lot 250.
802. <i>Quartz</i> , elongate, reddish and green skin, prismatic column three narrow, sub-parallel bands [Lodovico] in 1842.	
803. <i>Quartz</i> , elongate, blue-grey, with "bluish" veins; and green skin. (From Prof. M. P. Heddley) Ulan, Transcaucasus, Transcaucasus.	
804. <i>Quartz pseudomorphous after Natronite</i> pink remaining needles. Blister stone. Germany, southern.	

Portland Catalogue

(359)
3464. Blue Feldspath with white Quartz, and Mica argentea, rare, from Soudern 3465. A specimen of Lead Ore of a blue colour, and a fine green crystallized Copper Ore, both rare
3466. A curious specimen of subrescent native Silver, in Terra ponderosa, from Saxony
3469. A fine specimen of the true kind of Ambergris, extremely scarce, weight near two ounces (Avoydupo)
3470. A large thick and short double-pointed Crystal, intensely filled with singularly shaped cavities, from Hungary—rare
3471. A curious and picturesque crystalline mineral, from the same source as quartz
CURIOUS ORES OF METALS, AND SEMI-METALS, CRYSTALS, &c.
4004. A very large and elegant specimen of yellow crystallized Sulphur, on a group of white spars, from Siberia—extremely scarce
4005. A large and rich specimen of native foliated Gold, on a grey-quartzose Stone, from Potosi, in Peru—extremely scarce
4006. A large and fine Crystal, with a tuft of green capillary thin within it, extremely curious and rare, from Lombardy
4007. A most elegant rhombohedral hematite from Ore, with a glossy surface, curiously formed like Chiffre railing, with gears, wheels, &c. exhibiting one of the most beautiful natural specimens of the kind which I have seen
4008. A very fine specimen of flat six-sided Fluors, tinged with native cinnabar, upon a cinnabar base, from a mine long since left by nature near Wolfsberg, in the Palatinate—extremely scarce
CRYSTALS, SPARS, ORES, &c.
3321. A fine mixture of crystallized gold-coloured Marcasites, and small quartz Crystals, fused together a most beautiful specimen, from Saxony
3322. A most curious bell-shaped white columnar Spar, very beautiful, from Saxony 3323. A curious group of small quartz Crystals, some of them coated with a deep red Mineral, on a bed of Chalcedony, from the Palatinate
CURIOUS ORES, CRYSTALS, &c.
3974. A fine specimen of crystallized Auriferous, from Anvers in France, very rare
3975. Part of a Brazilian pebble Crystal, reflecting prismatic colours, very beautiful 3976. A fine Brazilian Copper Ore, with a very fine, but not very rare, very rare

ECHINA.

E. stipite longo flexuosa, capitula globosa solida echinata.

1. Natural Size
2. The Insect & plant magnified
3. Section of the Capitula
4. The center of the capitula of a firm fungaceous consist
5. Concentric cells which contain
6. Small Chrysalis-like Vesicles filled with a pale stiff
gummy matter which at a more advanced
period become transparent and firm resembling
a seed.
7. A small cobweb-like white woolly web which covers
each cell of the Capitula.

Found upon the Right-hand edge of the walk, going from Cain
& Abel to the Dairy amongst *Polytrichum commune*.

Sept 19 of August 1782

W. L.

87486.	<u>Gold.</u> Sedentive on coarse granular quartzite. Cacto, Minas Gerais, Brazil.	87486. Haut. Val, 1834, 576. Bought at Lady Aylesford 5239. H. Heuland's Appt. Aug 786. Sale, May 8, 1836. Hautland 3917. 2550.
7.	So. In massive white quartz. Eule, Bohemia.	Haut. Val, May 1834, 523. So. Hautland 5311. May 9, 1836. Aug. 423. 2550.
8.	So. Lamellar in grey massive quartz. Zell, Zillertal, Tyrol.	Haut. Val, May 1834, 524. So. Hautland 4891. May 9, 1836. Lady Aylesford 5260. 2550. Aug. 429.
9.	So. Indistinct crystals with wolfram, smoky quartz, and talc. La Gardette, Isère, France.	Haut. Val, May 1835, 526. So. Hautland 5735. May 13, 1835. Lady Aylesford 5231. 2550. Aug. 396.
87490.	So. Thin folia & stringy penetrating calcite.	Haut. Val, May 1835, 576. So. Lady Aylesford 3827. May 13, 1835. 2550.

544 Native Gold, with Werner's Needle ore, on a group of Rock-crystals, rarissime,
La Gardette, Dauphiné, to be put up at £1. 10s.