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Emily Margaret Wood: Botany, illustration, nature writing and teaching in Liverpool at the end of the long nineteenth century

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Abstract
Emily Margaret Wood (1865-1907) is today best known to botanists for her extensive set of illustrations in the 1902 *Flora of the Liverpool District*. In addition, she is a minor name in the history of British ceramics as an artist working at the Della Robbia Pottery in Birkenhead. Here we outline her life and career, showing that she had a much wider influence on botany in Liverpool around 1900, especially via the Liverpool Naturalists' Field Club. Her botanical illustration work was more extensive than just the Flora illustrations – and includes a set of surviving water colours of fungi of the Liverpool area. She also worked in local journalism, writing country diary style essays for local papers, and as a teacher of botany and Nature Study. In addition, she produced a British edition of George Atkinson's Nature Study text, *First Studies of Plant Life*, a couple of years before her premature death aged 42.

Keywords
Local flora; botanical illustration; Della Robbia; Nature Study; 'painting one's Bentham'

Introduction

A twenty-first century British botanist has access to a wide variety of full colour illustrated identification books, however these only became commonly available during the second half of the twentieth century. In the nineteenth and first half of the twentieth century portable identification guides relied mainly on keys and verbal descriptions, increasingly supported by black and white illustrations. Indeed, in the late nineteenth and early twentieth centuries there was a fashion for colouring in line drawings from editions of Bentham's Flora, so creating a personal coloured identification guide. This was a pastime that became known as 'painting one's Bentham' (Allen, 2010). This is the context in which Emily Margaret Wood (1865-1907: Fig. 1) is currently known, as she was the illustrator for the 1902 *Flora of the Liverpool District* (Green, 1902) - produced by The Liverpool Naturalists' Field Club an organisation in which Miss Wood played an important part. As David Elliston Allen

(2010) pointed out, in one of the few recent references to her work, this Flora 'exceptionally doubled as an identification guide thanks to being furnished with black-and-white drawings of over 800 flowering plants and ferns by Emily Margaret Wood'.

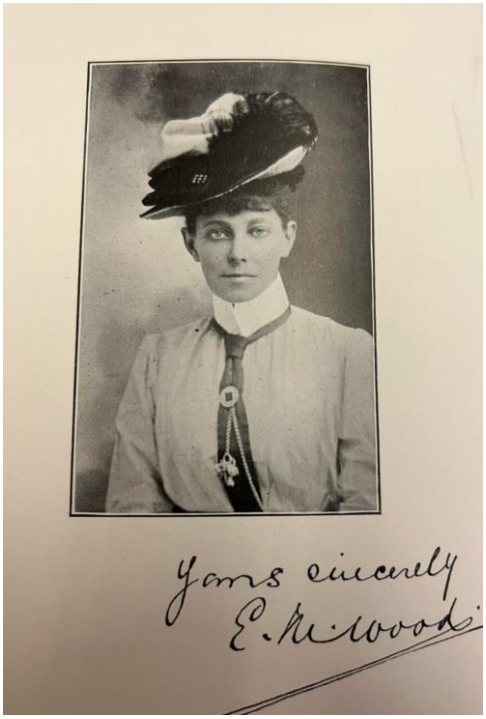

Figure 1. Emily Margaret Wood from the obituary by Ellis (1907). As a studio portrait she had presumably dressed for the occasion to highlight how she wanted to be seen by society. Crane (1999) suggests that in Victorian society the female use of a male looking tie was usually 'an expression of independence', and this style has been considered 'central to the "feminist uniform" '. Photographs of women wearing ties become commoner towards the end on the 19th century.

Here we primarily follow a biographical approach, but with reference to the social and cultural history of the times, to describe the life and work of a female Liverpool-based botanist at the end of the long nineteenth century – a time which includes the Edwardian period and runs up to the start of the First World War. Miss Wood not only worked as a botanical illustrator, but also as a plant recorder, botany and Nature Study teacher, a journalist writing county diary style columns for the local press, and an artist at Della Robbia, an Arts and Crafts influenced pottery in Birkenhead. As Scharma (2002) pointed out, for women coming of age in Britain in the 1880's 'there was much to celebrate' as long as you were middle class, with increasing opportunities and legal rights. The naturalists' field clubs, which developed during the second half of the nineteenth century, were socially interesting organisations as they often deliberately strove to break down distinctions of both class and sex. For example, the organiser of the Chester Field Club – Charles Kingsley, friend of T.H. Huxley and Charles Darwin – insisted that all members used second class train travel on excursions, so they could all travel together. The large

number of female members led to the Manchester Field Club being referred to as the 'Field and flirtation society'- the Liverpool club also had a high female membership (Allen, 1987). This was a time where a gap was starting to develop between the interests of amateur naturalists and the majority of professional academic biologists, who were starting to routinely use methods out of reach for amateurs (Allen, 1998). It is also the period when plant ecology started to develop as a distinct subject in Britain (Bowler and Morus, 2005). These various trends form the wider context in which Miss Wood[1] tried to build a career as a botanist, artist, writer and teacher.

Calcutta and London, early life prior to moving to Liverpool

E.M.W. was born in Calcutta (now Kolkata) India on the 23rd August 1865 and the register of baptisms from Saint John's Church (the rather grand original Anglican cathedral in India), shows she was baptised later that year on the 1st November. Her father, Charles Bell Wood, was described as a 'merchant & broker'. Her mother Emily Maria Wood (née Riddell) was born in London on 26 June 1842, but not baptised until 3rd February 1856 at St George's, Hanover Square, London – another rather grand church. E.M.W.'s father was born in Agra Province Bengal, and baptised on 29th November 1824, where his father held the military rank of Captain in the Household Cavalry at the time. So E.M.W. is very much a child of the British Empire, and born into a family that seems to have some social standing.

She came to Britain in 1871 (Desmond, 1994). The 1871 census suggests she may have been sent to school in Britain while her parents were still in India. There is a seven-year-old Emily M. Wood boarding at 2 Denmark Road, Bromley, South London. She is described as a 'scholar', although her place of birth is listed as 'Sevenoaks'; however one of the other boarders has their place of birth listed as Calcutta and it seems probable that the places of birth of these two boarding scholars have been accidently switched in the census. This seems particularly likely as in the next census (1881) the whole Wood family are living close by in Bromley.

By the 1881 census she is living at 10 Park Grove, Bromley with her parents and three brothers. She is again described as a scholar, her fathers occupation is given as 'nil' while her mother is described as artist and teacher of drawing. Given she is mainly known today for her illustrations in *The Flora of the Liverpool District* the fact that she had an artistic mother is of some interest. We know that as a 'scholar' in her late teens E.M.W. was taking art qualifications at The Bromley School of Science and Art. There is an account of the school's annual prize-giving in *The Bromley Journal and West Kent Herald* for 18 January 1883, at which she received certificates in 'Freehand' and 'Model Drawing'. A late 19th century text book on drawing from ten years later (Morris, 1894), designed for use in schools like the one she attended, which were overseen by the Department of Science and Art, shows

[1] Wood was often referred to as 'Miss Wood' in formal documents such as the *Flora of the Liverpool District*. As a witness to the marriage of her brother Herbert in 1898 at St. Catherine's church Tranmere she signed the certificate as 'E. Margaret Wood' suggesting she preferred her second name, as does a contemporary note (possibly in Wood's own hand) on the back of fungal watercolours in the Williamson Art Gallery (described below) saying 'Painted by E. Margaret Wood'. As her mother was also called Emily it's also possible that Margaret was used in the family to distinguish the two Emily's. However, in newspaper accounts of her art school qualifications (described below) she was described as 'Emily M. Wood'. In her later journalism she used her initials E.M.W. (and also in a letter drafted by her and preserved in the 1901–1911-minute book of the Liverpool Field Naturalists Club - item 1/3 in the club archive now in the archives at the Maritime Museum Liverpool). She used 'E.M. Wood' or 'E.M.W.' to sign art works, and in addition used 'E.M. Wood' on the title page of Atkinson and Wood (1905). For brevity we mainly use 'E.M.W.' in this paper.

that 'free hand' is drawing without the mechanical aids that are used in geometrical or technical drawing. Many of the examples shown in Morris (1894) are botanical. While in free hand the student would often be copying existing drawings in 'Model drawing' three dimensional items were used as the model for the drawing (so although the term model drawing may suggest drawing the human figure to a modern reader it was closer to what we might call still life). Given that outside botany E.M.W. is now known as one of the more minor (or at least less well-studied) artists working at the Della Robbia Pottery it is of interest that key examples of model drawing illustrated by Morris (1894) are of vases and jugs.

The address at the awards ceremony and prize giving was given by Sir John Lubbock; banker, politician, a writer with interests in natural history and archaeology, and former neighbour and friend of Charles Darwin. In the context of E.M.W.'s later involvement in the Nature Study movement this is an intriguing early influence – as his natural history writing was an influential source for many people involved in teaching Nature Study in Britain (Allen, 1976). According to the newspaper account in his speech Lubbock related an anecdote on the importance of careful observation and drawing from life in biology. He described T.H. Huxley drawing illustrations of specimens on the blackboard during a lecture. Later Huxley got the students to draw one of these specimens viewed under a microscope. 'He found in the first drawing the object was wrong and he said "How is this? This is not like what you are looking at!" "No Sir" was the answer "but it is what was on the black-board".[2] Lubbock went on to stress how much was still to be discovered by science. One of his illustrations of this was botanical, pointing out that, 'among the lower plants, the cryptogamous, there was not probably more than one in twenty of which the whole life history is known to us'. E.M.W.'s later botanical interests were to include both bryophytes and fungi.

Life in Liverpool

E.M.W. and her family arrived in Liverpool around 1885. Ellis (1907, p.11) wrote that she and her family moved to Liverpool 'some twenty-two years ago'. Hawley (2001) in a thesis on female artists at the Della Robbia Pottery suggest a similar date saying that E.M.W. moved to Liverpool aged 20 (although she does not state her source which therefore could be Ellis (1907). In the 1891 census the family is living at 3 South Villas, Sandrock Road, in Wallasey on the Wirral just across the Mersey from Liverpool. Neither E.M.W. nor her parents are in employment, however the two brothers who are living at home are working. Her father is 66 and presumably living on investments, as was likely the case in Bromley too. On the marriage certificate of E.M.W.'s brother Herbert (see footnote 1), their (by then deceased) father was described as a 'Bank manager' – although it's not clear at what point he held such a job (in India or London or Liverpool). It's only after her father's death in 1895 that we have clear evidence of E.M.W. in paid employment.

In his obituary for E.M. Wood[3], in the *Transactions of the Liverpool Naturalists Field Club*, Ellis (1907, p.11) reminisces that 'my earliest recollections of her and her

[2] Student behaviour changes much more slowly than technology does. DMW has on multiple occasions in University practical classes found students drawing a picture downloaded from the web on their smartphone, rather than drawing from 'life' the actual specimen in front of them.

[3] There were also two substantial obituaries in the local papers – along with several shorter reports of her death in the local press and briefer obituaries in several botanical journals. The longer accounts of her life and death

work dates from about 1887, when she joined the Liverpool Naturalists' Field Club. About the same time she exhibited a set of beautifully executed water-colour drawings of wild flowers at one of the Soirées of the Associated Scientific Societies of Liverpool, in St. George's Hall, and I remember well how favourably received was this work by a then unknown artist'. He goes on to relate that this attracted the attention of the chairman of the Liverpool Museum sub-committee[4] which led to her obtaining 'unusual facilities for working amongst the valuable collections in our Museum' where she was commissioned to make paintings of their glass models of jellyfish and related animals to send to the National Museum of the United States in Washington.

As well as the flower watercolours exhibited in St. Georges Hall around 1887, she is also known to have exhibited a painting in an exhibition in The Walker Art Gallery in Liverpool in 1892 (Hawley, 2001). There is also a previously undescribed collection of 62 watercolour paintings of fungi in the collection of the Williamson Art Gallery, Birkenhead (Fig. 2). Forty-five of these were purchased by Birkenhead Reference Library in 1902 for £2-16-6d (this would have paid a skilled tradesman for around eight days work at the time).[5] While not all have dates associated with them, some are dated and show that they were painted over at least thirteen years – with the earliest being painted in 1886 not long after E.M.W. arrived in the Liverpool area. The fungal watercolours now in the Williamson collections fall into two main types. Some are decorative paintings of local fungi, either individual species or groups of fungi of mixed species. The majority however are clearly drawn to show technical details relevant to identification – for example including drawings of spores and/or line drawings of sections through the fungus to show how the gills join the stipe (stem). These make up the set of 45 paintings bought by Birkenhead Reference Library from E.M.W. in 1902. Four more of her fungal paintings are known to have come from a later donation, and the origin of the others is currently unknown. Locations where the specimen was found are given on some paintings, which are therefore obviously drawn from life; all of these are from sites on the Wirral with the exception of the Lilac Oysterling (*Panus conchatus*) from Clapham, in the Yorkshire Dales. In general the spore drawings are lacking in detail; given that E.M.W. was clearly a talented botanical illustrator this suggests that she only had access to a rather basic microscope.

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were in *The Birkenhead News* 2 November 1907 (the similarities between this and the signed obituary in the Liverpool Naturalists' Field Club Transactions suggest it was at least partly written by John W. Ellis), and *The* Wallasey *Chronicle* on the 2 November 1907. As described below *The Wallasey Chronicle* had published some of her journalism between April 1906 and February 1907.

[4]The Rev H.H. Higgins, who was also one of the founders of the Liverpool Field Naturalists' Club (Anon, 1935).

[5] Details of the purchase are given in a hand-written librarian's report from 26 August 1902 (a copy is in the collection files of the Williamson Art Gallery). The estimate of the buying power of the purchase price were made using the currency converter on the National Archives web site. These watercolours were transferred to The Williamson Art Gallery in 1983, including the four additional fungal watercolours by E.M.W. which had been donated to the library by N.F. Ellison of West Kirby; no original documentation for these additional donations survives, only the information in the Williamsons accession register. The remaining paintings, from an unknown source, were also transferred from the Birkenhead Library in 1983 (Josh Mackerell, pers. comm.). The four Ellison paintings include small line drawings showing sections through the fruitbody but no spore drawings. All of the fungal watercolours can be viewed on the Williamson Art Gallery web site (https://williamsonartgallery.org).

Figure 2. Two illustrations of Fly Agaric (*Amanita muscaria*, called *Argaricus muscarius* by E.M.W.). The left-hand image is an example of her more decorative fungal paintings (original 38 cm x 27 cm, painted in 1897, BIKGM 6811). The right-hand image shows the same species but painted to show technical details such as spores, and with taxonomic details (species, genus and order) written underneath (25.1 cm x 17.6 cm, BIKGM 6760). Although this example is not dated many of these more technical fungal drawings appear to have been painted during 1899. Images courtesy of Williamson Art Gallery and Museum, Birkenhead (Wirral Museum Services).

Like many botanists at the end of the long nineteenth century E.M.W. created a personal herbarium; in his standard listing of past British botanists Desmond (1994) states that her plants were 'formerly at Grosvenor Museum, Chester'. The plants were apparently still in Chester at the start of the 1930s, according to an earlier edition of the same catalogue of British botanists (Britten and Boulger, 1931). In the 1980s someone (probably the late David Elliston Allen) looked for her material in Chester but failed to find it (John Hunnex, pers. comm.). In the early 1980s the plant material at the Grosvenor Museum moved to Liverpool Museum for safe storage, and was later returned to Chester. No material of E.M.W.'s turned up during these moves. Currently the only known surviving plant material of E.M.W. are two specimens she collected that are now in the herbarium of J.A. Wheldon at the National Museum in Cardiff (the moss *Grimmia hartmannii* from Lanbedr, North Wales and knotted clover *Trifolium stratum* from closer to home from Leasowe on the Wirral)[6]. There is an interesting link between E.M.W.'s herbarium work and her botanical art work. At the Welsh National Eisteddfod in 1904 she won 'the competition for botany, the prize of £2 2s for the best collection of plants, mounted

[6] There is one other herbarium sheet in Birmingham attributed to E.M.W. on the herbaria@home web site (http://herbariaunited.org/specimen/264490/). Shepherd's cress *Teesdalia nudicaulis* collected in Surrey in April 1896 by William West and 'E&S Wood'. The website identifies E. Wood as EMW. However, we are aware of no close relative called 'S. Wood' (and invariably E.M.W. used her middle initial in giving her name), so we are uncertain about the attribution of this herbarium sheet to E.M.W.

and named, illustrating the flora of any Welsh District'[7]. Following E.M.W.'s death this herbarium was used by Dallman (1913) as one of the data sources for a paper on the flora of Denbighshire. He describes them as being contained in three bound volumes and including 200 plants (including cryptogamia) collected from the area around Llansannan. They had been loaned to Dallman by Mr John Morris of Liverpool and Llansannan. We have failed to find any reference to this collection after 1913. From the 1890's onwards her involvement with the Liverpool Naturalist's Field Club became more substantial, and presumably much more time consuming. From 1895 she became joint botanical referee for the society alongside Robert Brown (the existing referee), and from 1900 she became the sole botanical referee for the Field Club (Brown died in April 1901). Her appointment to the position of botanical referee suggests considerable faith in her plant identification skills by other members of the Field Club. Following her appointment as referee she is responsible for writing the annual report of field excursions and plants found for publication in the Club's Transactions. These reports usually make up a significant proportion of this annual publication, and she wrote these for the last 14 years of her life. In 1901 she also became joint secretary of the Field Club alongside Dr. J.W. Ellis[8]. Ellis was a Liverpool based physician, naturalist of wide interests, and a serious amateur photographer. She was made an honorary member of the Field Club in 1904.

E.M.W.'s father died in 1895. By the 1901 census E.M.W. and her mother had moved and are living at 17 Frodsham Street, Birkenhead, and for the first time E.M.W. was listed as having an occupation, namely 'decorator of pottery'. The Frodsham Street house appears to be smaller than their address from ten years before, and this – along with the fact that she now had a paid occupation – suggests that the death of her father may have left the family short of money. It's known that she was working as an artist at the Della Robbia Pottery in Birkenhead. The pottery started in 1894, and although producing upmarket art pottery sold in Liberty's of London, amongst other places, it was never very profitable and closed in 1906. Unfortunately the firms archive did not survive so we do not know exactly when she started working there.

The role of designers and decorators at Della Robbia were often interchangeable, and as a small company it seems that there may never have been more than seven or eight decorators employed at any time (Hawley, 2001). Works carrying E.M.W.'s mark are in several museums and art galleries, including national collections.[9] In the light of our speculative comments on how E.M.W. chose to present herself in a surviving photographic portrait (Fig. 1), it's interesting that the workers at Della Robbia were in many cases associated with socialism, suffragism, and the positivist church (Hawley, 2001). Today the positivist church is not well known, however it attempted to fill the theological gap often filled by established religion with something more rational, while maintaining some of the ceremony of

[7] 'National Eisteddfod at Rhyl' in *The Free Press* Saturday 10 September 1904. Her prize would have the purchasing power equivalent to 6 days work by a skilled tradesman according to the National Archives currency converter 1270-2017.

[8] These details come from the annual *Transactions of the Liverpool Naturalists Field Club*. Note that Green (1902) incorrectly lists Ellis as the sole Secretary to the club.

[9] For example, there are two E.M.W. tiles in the collection of the Victoria and Albert Museum in London. These are not currently on display but can be viewed on the V&A's web site. Their accession numbers are C. 147-2018 & C. 148-2018. Much closer to her former home there is a spoon warmer in the shape of a fish in the collections of The Williamson Art Gallery, Birkenhead dated 1900 and bearing her mark on the base (BIKGM.55).

formal religion. This led T.H. Huxley to complain that their approach was just 'Catholicism *minus* Christianity'. Although the positivist church was often associated with progressive social causes, in Liverpool at the end of the long nineteenth century it seem to have been more inward looking concerned with 'apolitical formalisms: readings, prayers and music' (Wilson, 2015)[10]. While there is no documentary evidence to suggest to what extent E.M.W. was involved with any of these causes and organisations, people who were involved would have been her co-workers at the pottery. As for her personal religious views it seems likely she attended the Anglican Church into which she had been baptised, as this was the denomination of the vicar who conducted her funeral.[11] The somewhat socialist ethos at Della Robbia matches the approach of the Field Naturalists' Clubs which, as described in the Introduction, often had a membership crossing the class divides, and deliberately tried to downplay class status in their activities (Allen, 1987). Given that some of E.M.W.'s work for Della Robbia is now in important public collections, and others make decent sums at auction[12], its notable that only one of her obituaries, in the *Wallasey Chronicle*, makes even brief reference to her work at Della Robbia. This could have been because her obituary writers (notably Dr. Ellis) were mainly interested in natural history, or possibly because they did not want to draw attention to her having to work for a living (however they did comment on her journalism).

Being an artist working in a pottery such as Della Robbia provided a socially acceptable employment for a middle class woman around 1900. Other similar respectable occupations included teacher or governess (Hawley, 2001). Clearly the work at Della Robbia didn't provide the income needed by E.M.W. and she seems at this time to have had several jobs running in parallel. One of these was indeed teaching (discussed below in the context of the Nature Study movement), in addition she was also working as a journalist writing country diary style articles for the local papers. From 16th February 1903 to 7th November 1904 she wrote weekly articles for the *Liverpool Mercury*. These stop in November 1904 when the *Liverpool Mercury* merged with the *Liverpool Daily Post*. These articles were often around 1,700 words long, so turning out one a week would have been quite a commitment. They covered a wide range of natural history related topics from alien plants in the area, haymaking and meadow plants, remains of submerged forests on the local coastline, to the condition of animals in local zoos. Sometime they covered excursions further afield to places such as The Peak District, The Yorkshire Dales and Snowdonia (Eryri) - usually reached by train. Some of these may well have been field trips for The Field Club, which as Secretary she helped organise. One of the advantages of naturalist field clubs was their large membership could allow them to negotiate discounted rail travel on such excursions (Allen, 1987). From 7th April 1906 to 16th February 1907 she wrote similar monthly essays for the *Wallasey Chronicle*. In addition, she appears to be selling art works around this time, such as the set of fungal watercolours bought by Birkenhead Reference Library in 1902.

[10]In the light of Huxley's quip about 'Catholicism *minus* Christianity' its intriguing that a church built for the Liverpool positivists at the start of the 20th century on Upper Parliament Street, Liverpool was later to become a Catholic church (Wilson, 2015).

[11] The Rev Mr. Nixon, of All Saints Church, Oxton. The *Birkenhead News* 2 November 1907.

[12]For example, a vase for which she was the sgraffito artist (i.e. she carved the design into its surface) sold for £2,816 at Bonhams in December 2022.

The flora of the Liverpool District.

The main botanical achievement for which E.M.W. is known today are the illustrations (Fig. 3) in the 1902 Liverpool Flora (Allen, 2010; Desmond, 1994; Green, 1902). Indeed, in a news item in *Nature* to mark the Field Clubs 75th anniversary, the publication of a series of local Floras was singled out as one of its major achievements (Anon, 1935). The year before when *Nature* reviewed the revised 1933 edition of the Flora the anonymous reviewer opined that; 'Miss Wood's admirable line drawings, which express the 'look' of each plant in a most remarkable way, are still one of its most attractive features', although correctly pointing out that 'their reproduction is noticeably inferior in this edition' (Anon, 1934).

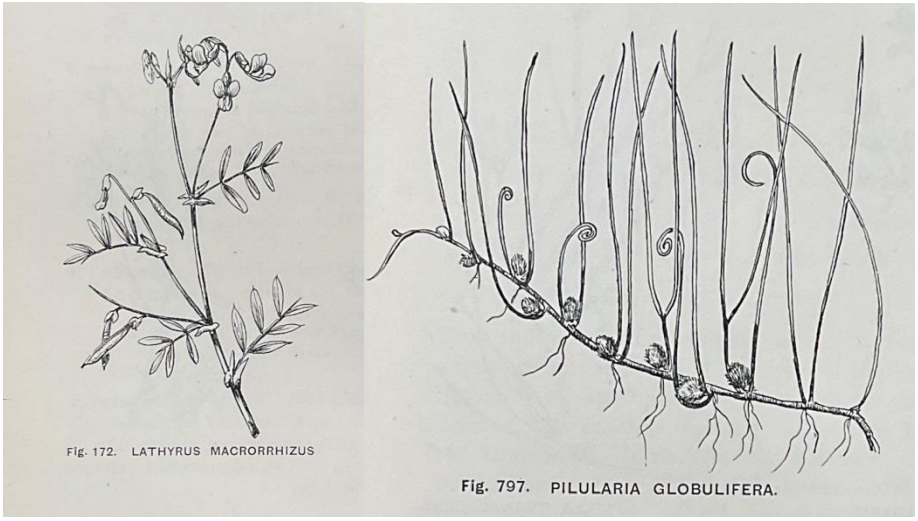

Figure 3. Two examples of the line drawings by E.M.W. in the 1902 flora. Left (Fig. 172) is Bitter-Vetch *Lathyrus linifolius* (previously *L. macrorrhizus*). In a review of the 1902 Flora in *Nature* the reviewer commented that E.M.W.'s drawings were 'for the most part characteristic and life like', and included illustrations of less common species which were 'very useful'. However, they complained that important identification features were missing from some species, giving Bitter-Vetch as an example because its roots were not illustrated (Anon, 1902). Nineteenth century Floras often described the roots as useful identification features (e.g., Hooker, 1870). E.M.W. also illustrated many ferns including the atypical fern Pillwort *Pilularia globulifera* (illustrated to the right, Fig .797). This drawing nicely shows key identification features. Early in his career D.M.W. worked on pillwort (Slater *et al*, 1991) and found that in cases of uncertainly looking for fronds uncurling in the characteristically fern like manner was a very useful identification feature. E.M.W. illustrates this very clearly.

The Liverpool Naturalist' Field Club (founded 1860) first published a Flora of the area in 1873, followed by updating supplements in 1873, 1875 and 1887. The 1902 Flora – for which E.M.W. did the illustrations - was mainly based on work done a few years before (1893-4), with E.M.W. being the only woman on the committee that oversaw the work (Fig. 4). However, a shortage of funds delayed publication until C. Theodor Green as editor paid for its publication 'at his own charges'. The cost of printing the large number of drawings of local plants by E.M.W. was covered by a

donation from a longstanding member of the field club – Mr. Charles Gatehouse. As well as E.M.W.'s botanical illustrations there were also 21 photographs of local scenery and habitats taken 'at much expenditure of both time and money to himself' by Dr. J.W. Ellis (Green, 1902).

Figure 4. A group photograph of 'some of the workers of the field club' from the 1902 Liverpool Flora (Green, 1902). Mr. Holt, Dr. Ellis, Dr. Green and Miss Wood were all members of the committee of the Liverpool Naturalists' Field Club set up to oversee the production of the 1902 Flora. Despite the Field Club having a large female membership (Allen, 1976), E.M.W. was the only woman on the seven-person committee. This photograph, taken six years before she died, makes her look rather thin and dark around the eyes – possibly relating to long term health issues hinted at in some of her obituaries.

In addition to serving on the committee that oversaw the Flora, and providing the illustrations, she also contributed many records of rare and unusual plants to the project. In the 1902 Flora botanists' initials are often given next to more notable records and E.M.W. provides over 40 of these from sites around the Wirral. This concentration of her records from the Wirral is unsurprising given the two addresses we have for her (from the 1891 and 1901 census) are in Wallasey and Birkenhead. Her plant records in the Flora are taxonomically widely spread (including pteridophytes), but include no graminoids. There are also a small number of plant records by her mother and her brother Herbert, suggesting that both art and botany were family interests she likely grew up with.

The large number of line drawings in the local Flora also lends itself to the idea of colouring in the plants in watercolour, as with the trend for 'painting one's Bentham' which was starting to be in vogue at the time. It is difficult to establish

how commonly this was done by owners of the 1902 Flora, (the majority of copies for sale by second hand booksellers are uncoloured). However, the paper used to print the 1902 Flora takes watercolour and in one of the examples known to us a few of the plants had been hand coloured (Fig. 5). In addition, E.M.W. hand coloured at least one copy at the time, which was donated to Birkenhead Reference Library in 1903 (Fig. 6).[13] This is of interest as the peak of the fashion for 'painting ones Bentham' is usually considered as being from 1915 onwards, and especially the 1920s, although mid-19th century examples are known (Allen, 2004).

Figure 5. Two examples of hand-coloured drawings of Marsh-marigold *Caltha palustris* from copies of the 1902 Liverpool flora. Left: an example by an unknown hand from a copy in the personal collection of D.M.W. (only three plants had been coloured in this copy). Right: the same illustration hand coloured by E.M.W. for a full coloured copy that was given to Birkenhead Reference Library in 1903 (Image courtesy of Wirral Libraries).

In the later 1933 edition of the Flora, Green (1933, p. xi) writes that 'It is intended to make over the copyright of this edition to the Liverpool Museum, so that blocks of illustrations and all other material will be in safe hands in the area where they belong, and will be available for revision at any future time.' It is unclear if the illustration blocks were ever given to Liverpool Museum, and if so if they survived the considerable damage to the museum by bombing during the Second World War.

Nature study teaching and first studies of plant life

E.M.W. also worked as a teacher. In the most substantial of the obituaries Ellis (1907, p. 12) wrote that; 'For some years she had been engaged in teaching of Botany and Nature Study at the Wallasey Technical School and other kindred institutions, and her success as a teacher was unrivalled, for she had a wonderful power of imparting information, and of infusing some of her own enthusiasm for nature into her pupils.'

[13] There is a hand-written librarian's report from 10th March 1903 listing donations, a copy of which is in the collection files of The Williamson Art Gallery, Birkenhead. This notes that; 'The copy of the "Flora of the Liverpool district" hand-coloured by Miss E.M. Wood, has now been received'. This rather beautiful book is still in the collections of the Birkenhead Reference Library (Fig. 6), and instead of the standard green cloth cover it has been rebound with a red cover and gilt-edged pages.

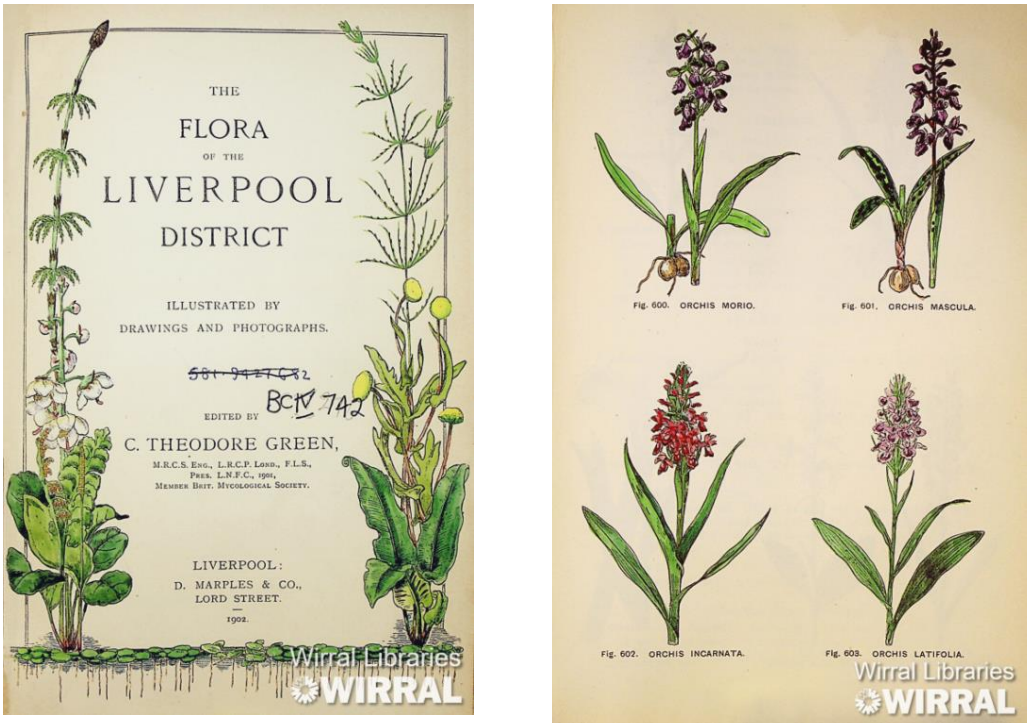

Figure 6. Title page and example page showing orchids from the copy of the 1902 Liverpool Flora hand painted by E.M.W. in the Birkenhead Reference Library. In the 19th century many more species of orchids were placed within the genus *Orchis*. Current names for the orchids illustrated are Green-winged orchid *Anacamptis morio* (Fig. 600), Early-purple Orchid *Orchis mascula* (Fig. 601), and two Early Marsh-orchids *Dactylorhiza incarnata* (Fig. 602) and *Dactylorhiza incarnata* (Fig. 603) - which was considered a full species in many 19th century Floras (e.g. Hooker, 1870). Images courtesy of Wirral Libraries.

The Nature Study movement rose to prominence in both Britain and The United States of America during the 1890's, and it formed part of a range of educational reforms in the late 19th century. It aimed for an observational interaction with nature (rather than rote learning of 'facts') and was often targeted at younger children to provide a background to more formal science education by developing their observational skills. The emphasis was on direct studies of local nature, and in contrast to more traditional natural history teaching, concentrated on observing how the organisms lived rather than on systematics and formal identification (Allen, 1976; Kohlstedt, 2005). There seem obvious connections to the fact that ecology was starting to develop as a discreet area of academic research around the same time. As pointed out above there is an interesting connection to the prize giving event when E.M.W. was an art student in Bromley. John Lubbock, who gave the speech at the prize giving, was described by Allen (1976) as 'the 'foster-father' of the Nature Study movement in Britain', because his natural history writing tended to cover the types of topics that fitted this approach. In addition, T.H. Huxley – who Lubbock cited in his speech - had for some decades been recommending using

common objects and the local environment in science and geography teaching (*e.g.* Huxley, 1877).

A key date in the rise of Nature Study in Britain appears to have been August 1902, when a conference and exhibition on the topic was held in the Royal Botanic Society's gardens in Regent's Park London. This led to similar smaller events in other cities including Liverpool and Manchester (Jenkins, 1981). Liverpool also had a travelling museum which brought natural objects to schools to support such lessons (Newman & Driver, 2020). It seems likely E.M.W. used both live and dead specimens, as well as her art works, in her teaching. For example, at an evening meeting of the Field Naturalists' Club on 29th December 1905 she displayed 'Living ants in a formicarium, shewing the inhabitants engaged in their various occupations' along with 'Nests and specimens of British Humble Bees',[14] which presumably she had for use in her Nature Study teaching. It also seems plausible that the more technically detailed fungal watercolours may have been created to support her teaching, although they were sold to Birkenhead Reference Library only three years after they had been painted.

One strand of Nature Study had a hard science background, and in the United States scientists at Cornell University and the University of Chicago were particularly associated with this movement (Kohlstedt, 2005). At Cornell the Professor of Botany, George Francis Atkinson, produced a Nature Studies inspired text book on plant life in 1901. A British edition of this book was produced by E.M.W. 'for the use of English schools' and published in 1905 (Fig. 7). On the title page E.M.W. gives her affiliation as 'Teacher of Botany and Nature Study to the Wallasey Technical Classes, Cheshire'. For the 'English' edition she edits the book to remove Americanisms, and replaces many of the examples of American plants with British species. In addition, she added 30 new line drawings of plants by herself and 26 new photographs 'expressly done for this book' by Dr. John W. Ellis. Although the locations of the photographs – which show both plants and habitats – are not given many appear to have been taken around the Wirral and also in Delamere Forest in Cheshire[15]. In some cases the revisions to suit the British students are quite minor while in others entirely new examples have been added – such as the description of 'Arum or "lords and ladies"' (*Arum maculatum*) and its pollination mechanism. It is currently unknown how E.M.W. came to write the British edition of Atkinson's text, but the fact that she did suggests that her name was known as someone active in the area to the original author and/or his publishers.

[14] Details from a flyer advertising the meeting preserved in the Club's minute book, in the Liverpool Naturalist Field Club archive (item 1.3) in the Maritime Museum archives Liverpool. Bumble bees were usually called Humble Bees until early in the 20th Century.

[15] E.M.W. gave a talk on 'Delamere Forest, from its historical, natural and picturesque points of view' at an evening meeting of the Field Club on 26th October 1906, illustrated by almost 70 lantern slides (presumably taken by Dr. Ellis?). In the club's minute book (see footnote 1) someone had written that this was 'her maiden effort at a lantern lecture' but this had then been struck through, so she had presumably given at least one such lecture before this.

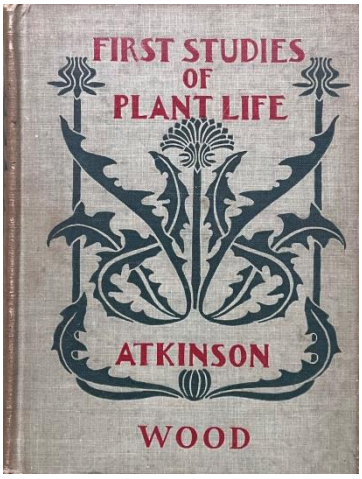

Figure 7. Cover of the British edition of Atkinson's 'First studies of plant life' (Atkinson and Wood, 1905). Note that Wood's name is almost as prominent as Prof. Atkinson's on the cover.

Death

E.M.W. died on 28th October 1907 at the age of 42. According to Ellis (1907) and the obituary in the *Birkenhead News* (see footnote 3, much of this seems to have been written by Ellis) she had been unwell for some time. Ellis (1907, p 13) wrote that '… only two or three most privileged friends knew how severely the circumstances of her life told upon a nature so finely moulded. The strain of last winter's work and exposure to inclement weather was keenly felt, and there was no opportunity for rest that was so urgently needed.' He goes on to say that 'her health, never robust, failed during the summer' and that she suffered a severe chill on the club's field meeting at Cefn-y-bedd – which was 'the last time she was out of doors'.

Della Robbia closed in 1906, which may have removed a major source of revenue and led to 'last winter's work [with] no opportunity for rest' as she tried to replace lost income. Certainly she started writing for the *Wallasey Chronicle* in April 1906. The Club's trip to Cefn-y-bedd (just north of Wrexham, and accessible by train) involved 36 members, and despite E.M.W. being 'attacked by a severe chill', the Club's minute book describes the weather as 'fine with the exception of a short shower'. It is conceivable that working at Della Robbia may have contributed to her long term health problems. By the end of the nineteenth century many places had stopped using lead glazes because of their toxicity, however Della Robbia continued to use them (Hawley, 2001). E.M.W. was buried at Wallasey Cemetery and the Field Club organised a successful public subscription to fund a cross at her grave.[16]

Discussion

This brief biography of E.M.W. and her botanical work raises a number of points of wider interest in the history of science. There is an obvious temptation for such biographical researches to be focused on key individuals who had major influences – for example T.H. Huxley, who is mentioned several times in this paper. This

[16] Details in the Club's minute book (see footnote 1). They estimated the cost would be £30.

downplays the importance of the large number of talented individuals who are responsible for the majority of work in science; we need to understand their working practices too. Huxley himself was a key figure in the professionalisation of science in Britain during the 19th century (Desmond, 1997). E.M.W. provides an example of a female botanist managing, perhaps with some difficulty, to make a professional living from a mix of teaching, writing and illustration at the end of the long nineteenth century – at a time when women were only just starting to be able to access academic careers in botany. For example, in Manchester, only an hours' train ride away from Liverpool, when Marie Stopes was appointed lecture in botany at the University in 1904, she was the first woman on their science staff (Rose, 1992).

As far as we have been able to establish E.M.W. had no formal training in botany[17] but studied art in her late teens. As described above we have established that her botanical illustration was much more extensive than just the Flora line drawings. However, her botanical interests were more wide ranging than just illustration. It is clear that she made a significant contribution to the Liverpool Flora project in general, both in providing plant records from her own field work and as the Field Club's botanical referee. Beyond this she played a major role in organising the club's activities as joint secretary with Dr. Ellis from 1901 until her death. E.M.W. and Dr. Ellis seem to have formed a close working relationship, both in running the Field Club and in illustrating two botanical books, with E.M.W. providing the drawings and Ellis the photographs. She also produced nature journalism for the local press at a time when such 'country diary' or 'nature notes' were expanding in British newspapers. The popularity of these nature notes was at least in part associated with the rise of Nature Study in schools (Allen, 1977), an area of education to which E.M.W. contributed – especially in producing a version of Atkinson's *First Studies of Plant Life* for use in British schools. Almost 50 years ago Allen (1977) wrote that 'There appears to be no general history of Nature Study in Britain'; despite some subsequent work this is still largely the case. E.M.W. provides an interesting example of a botanist and teacher, working away from London, delivering Nature Study to her own pupils and more widely through the Atkinson & Wood textbook.

In constructing an outline of E.M.W.'s life and career we have made extensive use of the methodology of the family historian. Kathleen Hawley (2001) in her study of the woman potters at Della Robbia also comments on the usefulness of these methods, often associated with amateur family history research, in trying to construct a basic outline of the lives of the Della Robbia artists in the absence of a surviving archive. As with Hawley's work we too have found family history databases invaluable, both for documents such as census returns, but also for the ability to search many contemporary newspaper archives (although locating some still required visiting a conventional hard copy archive). Fifteen years ago, Branch (2008) pointed out the potential usefulness of such approaches, using several historical botanists associated with Harvard University as his case study, and England (2017) notes the growing importance of being able to digitally search nineteenth century local newspapers in history of science studies. The ready availability and accessibility

[17] A 'Miss Emily Wood' was awarded a botany qualification at the Cork School of Science according to *The Cork Constitution* 21st July 1888. However, Emily Wood is a reasonably common name (for example there are four people called Emily Wood in Cork at the time of the 1901 census), and we have no other suggestions she was ever in Cork. So, we consider it is unlikely to be E.M.W.

of such databases should greatly facilitate the study of less high-profile botanists who, because they make up the majority of botanists, played an important role in the development of the subject.

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