



Anderson, L. I. and Taylor, M. A.
Charles W. Peach, palaeobotany and Scotland. The Geological Curator 8, 393 - 425
2008

<http://repository.nms.ac.uk/>

Deposited on: 16 September 2010

NMS Repository – Research publications by staff of the National Museums Scotland

<http://repository.nms.ac.uk/>

CHARLES. W. PEACH, PALAEOBOTANY AND SCOTLAND

by Lyall I. Anderson and Michael A. Taylor



Anderson, L. I. and Taylor, M. A. 2008. Charles W. Peach, palaeobotany and Scotland. *The Geological Curator* 8 (9): 393 - 425.

The move south from Wick to the city of Edinburgh in 1865, some four years after retirement from the Customs service, provided Charles W. Peach with new opportunities for fossil-collecting and scientific networking. Here he renewed and maintained his interest in natural history and made significant palaeobotanical collections from the Carboniferous of the Midland Valley of Scotland. These are distinguished by some interesting characteristics of their documentation which the following generations of fossil collectors and researchers would have done well to emulate. Many of his fossil plant specimens have not only the locality detail, but also the date, month and year of collection neatly handwritten on attached paper labels; as a result, we can follow Peach's collecting activities over a period of some 18 years or so. Comments and even illustrative sketches on the labels of some fossils give us first-hand insight into Peach's observations. Study of these collections now held in National Museums Scotland reveals a pattern of collecting heavily biased towards those localities readily accessible from the newly expanding railways which provided a relatively inexpensive and convenient means of exploring the geology of the neighbourhood of Edinburgh.

Charles W. Peach had a very 'hands-on' practical approach to scientific investigation which led him to construct novel glass plates with mounted *Sphenopteris* cuticle, removed intact from Lower Carboniferous shales and limestones originating in West Lothian. These resemble the herbarium sheets with which he was familiar from his parallel and highly significant work on extant flora including nearshore marine algae. He also prepared hand-ground glass microscope slides, particularly of permineralised plant material from Pettycur in Fife, using whatever materials he had to hand at the time. Peach's collection raises questions about the evolution of accepted standards of documentation in private collections, in parallel with the evolution of collecting practices by the new professionals such as the workers of the Geological Survey. Its relatively rapid deposition in museums, compared to many private collections, may also have contributed to its apparently high rate of usage by contemporary workers.

Lyall I. Anderson, The Sedgwick Museum of Earth Sciences, Dept. of Earth Sciences, University of Cambridge, Cambridge CB2 3EQ, UK; e-mail land07@esc.cam.ac.uk

Michael A. Taylor, Department of Natural Sciences, National Museums Scotland, Chambers Street, Edinburgh EH1 1JF, UK, also Department of Museum Studies, University of Leicester; e-mail m.taylor@nms.ac.uk. Received 12th January 2008.

Introduction and key sources

Amongst the local heroes of Scottish geology one must always count those collectors who broke through the limitations of their social status through self-improvement and assiduous study and research to become widely known in their fields (if all too often still subordinate to the metropolitan grandees). Some of those lads o' pairts became especially 'weel kent' in their day thanks to the activities of journalists: for instance, take the three great heroes of the

Old Red Sandstone north of the Great Glen. One might think that Hugh Miller (1802-1856) hardly needed other journalists to expound his own life story, being himself a newspaper editor (and eventually owner). But in actual fact he became known to many through the activities of Samuel Smiles (1812-1904), that exponent of self-help. Miller's fossil collection survives, mostly in National Museums Scotland (NMS). Another of Smiles' martyrs was Robert Dick, the poor baker of Thurso. But a third Smilesian geological hero is often overlooked

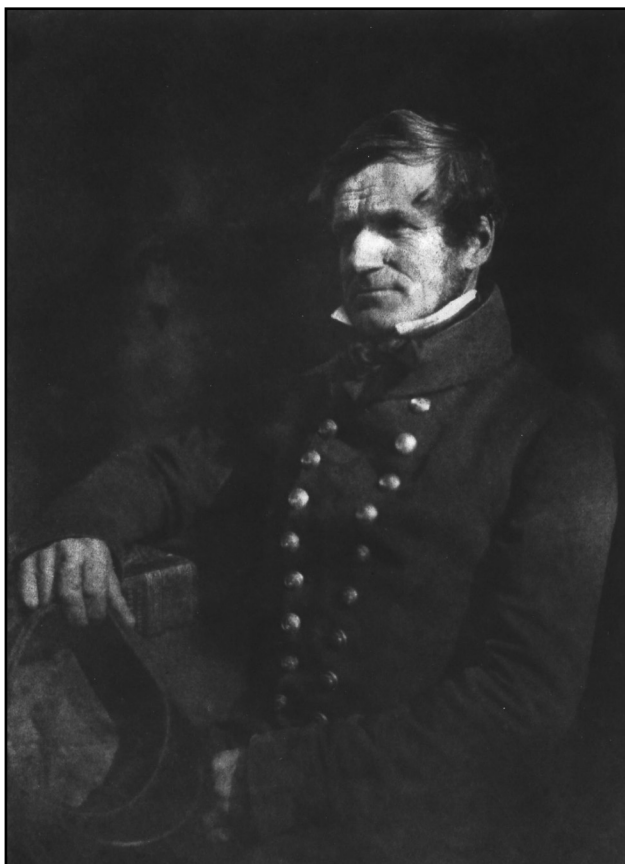


Figure 1. A reproduction of the calotype of Charles Peach in his Coastguard uniform taken by the photographic pioneers Hill and Adamson (SNPG PGP HA 1761) in 1844. Image provided courtesy of the Scottish National Portrait Gallery, Edinburgh.

because Smiles lumped him into the biography of Dick, presumably to fill it out, without mentioning him in the title. The subject of our paper is this third and last hero: Charles William Peach (born 30 September 1800 - died 28 February 1886) (Figure 1).

Charles Peach's collection was never lost, but some of it has only recently been recognised again within NMS. This arose during 2007 when the bulk of the Palaeobotany collections of NMS was audited and the data uploaded to the internal collections management database ADLiB. This work was undertaken by Dr Sarah E. Stewart, Dr Yves Candela, and the present authors, and has now generated a searchable summary database of NMS holdings within this subset of the collections. During this audit, which was in preparation for a move of the Palaeobotany collections to new storage, we had the good fortune to bring to light some historical treasures relating to Charles Peach. Some of those finds were well known to curators, but others had been overlooked, and certainly many had departed from institutional memory with the turnover of staff in recent years.

The Peach collection of fossil plants at NMS is distinctive above all for the attention paid to detail during the labelling of each find. In most cases, as well as the locality information, Peach indicated the date of collection. Those data allow us today to track his fieldwork day by day, and enable us to perceive why he was so highly rated by his contemporaries as a field collector. Furthermore, with some of the fossils, he provided small but accurate annotated sketches illustrating points of interest. These interpretive drawings talk down the years to us and give an insight into his meticulous observation and his obvious wonder at the beauty of the natural world.

As well as hand specimens of fossil plants, moreover, there is a significant collection of thin-section material mounted on glass. Much of this thin-section material appears to have been prepared by Charles Peach himself, judging from the handwritten annotated labels and variety of paper coverings. The technology of creating thin sections of fossils or minerals was long established in Edinburgh by the time Peach came to reside there. Morrison-Low (1992) detailed the life of William Nicol, a pioneer in this particular field of science, in which fossil plants such as the 1830 Craigleith tree played a major role. Oldroyd (1999) cited petrological thin sections as important sources of non-written evidence in studying the history of geology. From examining Peach's sections, we derive a sense of his commonsense attitude to getting science done by manufacturing his own thin sections from non-standard materials for microscopic examination (see Peach's handwritten notes in Figure 6).

We do not attempt general assessments of Smiles' (1878) broad-brush picture of Peach's life and work, or the later biography by Davey (1911, reprinted from a 1910 publication), badly needed as they are, as beyond the scope of our paper, which is in any case focussed on the NMS collections and their implications. But, in the absence (as far as we know) of any such recent attempt, caution is necessary in taking at face value the picture painted by Smiles (as with any other journalist or historian). Quite apart from the accuracy of his sources (which, in this instance, plainly included Peach himself: e.g. Smiles 1878, p. 393), Smiles had his own axes to grind, and his work is not always reliable (Jarvis 1997; for the views of another subject, Thomas Edwards, on Smiles' portrayal of him, see Secord 2003). One of us has long felt that Smiles' book on Dick is a blatant hagiography of a secular martyr of self-improvement, right down to going out collecting all night on a single oatcake and in wet socks, and it is a relief to

find Jarvis arguing that in fact hagiographies were indeed the model for much of Smiles' writing, to the extent that Smiles did not always allow the facts to get in the way of a suitably improving moral tale - while Jarvis (1997, p. 22) commented that Smiles 'never hesitated to allow his feelings to govern what he wrote'. That is not to say that Smiles is necessarily wrong on Peach - to whom, in any case, Smiles allocated the role of foil to Dick, looker-on and mourner, rather than Second Martyr (though Archibald Geikie, in a *Nature* review of the book, felt that Smiles had unfairly downgraded Peach's work on the Old Red Sandstone compared to that of Dick himself, and was apparently happy to see that view reiterated in the official petition for a further pension for Peach: Anon. [1882]). We suspect Smiles included Peach's happier fate to relieve the gloom induced in the reader by Dick's sad story, which in itself does little to encourage the reader in the path of self-help. But Jarvis added that one does need to know, if possible, 'what lay behind [Smiles' work], especially if we are using it as factual evidence'. And that, as already noted, is beyond the scope of this paper, except in one or two areas where the issue is directly relevant, as shall be seen below.

Our paper also draws upon a newly available MS account of Peach's life and work (Anon. [1882], NLS MS Ac 10073/6) held by the National Library of Scotland which acquired it in 1990 from the Royal Society of Edinburgh (Ms Sheila Mackenzie, NLS, pers. comm. 2007). This appears to contain information which may not be available elsewhere, and our publication is apparently the first actually to draw upon it. It was neither available nor used when writing Oldroyd (2004b; Prof. D. Oldroyd, pers. comm. 2007; it is listed in the apparatus later editorially added to that account, which is how we learnt of it). We therefore outline its nature, provenance and dating briefly here. It is an undated MS comprising a short biography of Peach; details of his coastguard and customs service with notable events and formal commendations; a list of standard works in the natural sciences which drew upon his work; honours from scientific societies, etc.; and details of his personal finances in the past and at the time of writing. It was obviously intended as supporting evidence for an application for financial assistance, and was plainly written with a detailed knowledge of Peach's circumstances and doubtless in close liaison with him (though it is not in his own distinctive handwriting of which we possess numerous examples from 1845 onwards).

We date the RSE document to 1882, and more specifically mid-February onwards to 28 December, by an

internal reference to its being written in the same, presumably calendar, year as the death of Peach's wife. His first and only known wife was Jemima *née* Mabson who died on 13 February 1882 (death certificate; death notice, *Scotsman*, 14 February 1882). A reference to Peach's daughter Jemima Mary Peach being aged 47 confirms this dating, as she was born on 28 December 1834. She was the 'eldest and only surviving daughter' (death notice, *Scotsman*, 2 September 1899), ruling out the possibility that she replaced an older sister who had carried the parental name of Jemima but died in infancy, as often happened in those days, as indeed it did with her two successive brothers Benjamin Neeve. This dating, and the RSE provenance, suggest strongly that the document was intended to support the application for funds recorded in the Minutes of Council for 1877-1884 of the Royal Society of Edinburgh (NLS Acc.10000, no.22). On 7 April 1882 "An application was submitted, requesting the Council to back up a Memorial for a Government pension to Mr Peach, senior. The Council resolved to take in the matter whatever action might be recommended by Professor Geikie"; and on 5 May 1882, there was "[r]ead Letter from Professors Geikie and Ramsay as to the Memorial in favour of Mr Peach. Professor Geikie's suggestion to request the Duke of Argyll to present the Memorial was approved of." (Ms Sheila Mackenzie, NLS, pers. comm. 2007).

Finally, it is often mentioned that Peach had nine children of whom seven survived to maturity, although usually only the famous Ben Peach receives any attention. We have attempted to trace all nine with some success, in the interests of verification, and as some siblings appear in our story, and our results are appended at the end of this paper (Appendix 1).

Archival sources. Repository and society abbreviations: BAAS, British Association for the Advancement of Science; BSE, Botanical Society of Edinburgh; CUL, Cambridge University Library; EGS, Edinburgh Geological Society; EMSA, Edinburgh Museum of Science and Art (renamed RSM in 1904); ENFC, Edinburgh Naturalists' Field Club; NAHSTE, Navigational Aids for the History of Science, Technology & the Environment project database, <http://www.nahste.ac.uk/>; NLS, National Library of Scotland; NMS, National Museums Scotland (formerly National Museums of Scotland, incorporating RSM); RBGE, Royal Botanic Garden Edinburgh; RPSE, Royal Physical Society of Edinburgh; RSM, Royal Scottish Museum (formerly EMSA and incorporated into NMS in 1985).

Statutory records of births, marriages, deaths, wills and executors' inventories, and census data in Scotland used were downloaded from www.scotlandspeople.gov.uk, the official Scottish Government web portal for statutory records such as those of the General Register Office for Scotland and the National Archives of Scotland. It should be borne in mind that under Scots law, wills often did not deal with 'heritable' property, i.e. real estate, which automatically went to the eldest son, and the resulting inventories commonly dealt only with 'moveable' property, i.e. money, furnishings, personal effects, etc. The data for the 1841 census were downloaded from <http://freepages.genealogy.rootsweb.com/~kay-hin/ukocp.html>. All downloads from websites other than www.scotlandspeople.gov.uk were printed and filed (in NMS Palaeontology Sections/Persons files) on 11-14 December 2007 except where stated.

Charles Peach's life and work: an outline of some significant elements

Charles W. Peach earned his living from 1824 to 1845 as a coastguard in the customs service, patrolling a stretch of coast against smugglers, and from 1845 as a Customs officer, doing work such as reporting shipwrecks and claiming Crown rights in them. This wide-ranging duty gave him a scope for collecting which was geographically much broader than comparable collectors of similar social status, such as Hugh Miller of Cromarty, who was tied to his bank job from 1836 to 1840, and Robert Dick of Thurso, who was thirled to his baker's oven (Knell and Taylor 2006; Smiles 1878, especially p. 257). Originally from Wansford, Northamptonshire, Peach served in several parts of England (Norfolk, Dorset and Devon) before settling for a while in Cornwall. He was then moved to Peterhead in Aberdeenshire in 1849 (Figure 2). The 1851 Census records the household (Charles, his wife, the six children Charles, William, Jemima, Elizabeth, Joseph and Benjamin, and one servant) residing at 8 Maiden Street, close by the busy harbour of Peterhead where Peach was principally employed. Upon promotion in 1853 he moved to the port of Wick in Caithness (Figure 2). The 1861 Census records Charles and Jemima with only two of their offspring, Jemima and Joseph, remaining at home, and one domestic servant, living in Argyle Square, the main central square of Pulteneytown, the Wick fishertown laid out by Thomas Telford.

By this time Charles had an established reputation as a naturalist and marine biologist, although, sadly contrary to legend, he was not the custodian of

'Granny' the septuagenarian sea anemone, nor is she in the NMS collections (Swinney 2007). Quite separately, Peach developed as a geologist (Oldroyd 2004b), and he continued to engage in this interest while at Wick. For instance, his discovery of fossils in the Durness Limestone (Murchison 1867) was crucial in the early stages of what has been called the Highland Controversy over the dating and structure of the rocks of the North-west Highlands of Scotland (Oldroyd 1990).

Peach, on the face of matters, fell into Torrens's (2006) category of 'outsider': someone who derived his living from outwith the field of geology but who provided significant contributions to the science in terms of material data, published papers and inter-connection with the leading figures of the day. For instance, in a major review of the geology of northern Scotland, Roderick Murchison (1859) repeatedly

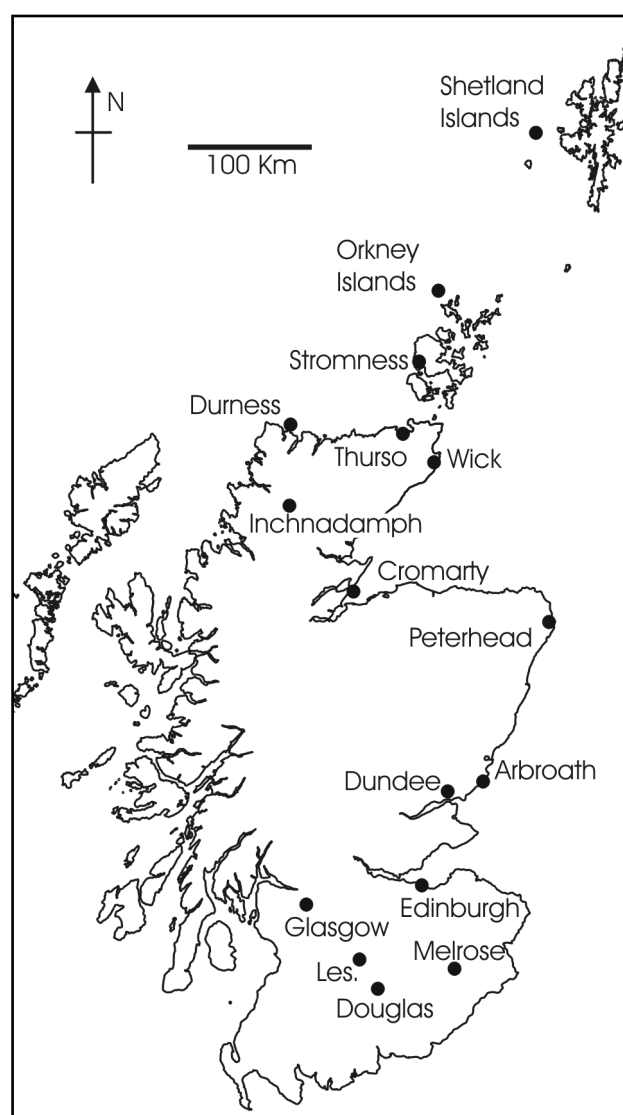


Figure 2. Map of Scotland displaying the place names referred to in the text excluding specific fossil localities as detailed in Figure 3. The village of Lesmahagow is indicated by the abbreviation 'Les.'.

cited the 'keen-eyed' (p. 367) Peach's collecting activities and field observations, which had provided Murchison with many critical data for his own theoretical synthesis (all too often the role of the provincial collector!). Murchison regretted that duty had allowed Peach to accompany Murchison for only part of his field trip, but noted that the fossil plant *Caulopteris peachii* Salter was named after Peach at Murchison's request by Salter in Murchison (1859). Dawson (1871) incorrectly attributed Salter's description of this species to a paper published in volume 14 of the *Quarterly Journal of the Geological Society of London* in 1858 (Salter 1858). He did however mention that he had seen the original specimen in London shown to him by Mr Etheridge. This specimen, BGS GSM 31663, matches Salter's figure and therefore appears to be the holotype (Dr Mike Howe, pers. comm. December 2007). Peach must have retained the counterpart which ended up in the NMS and was eventually registered as NMS.G.1964.13. Oddly enough, however, as Peach himself noted (1880, p. 151), "This very fine form was first found by Mr J. Budge of Thurso, in the Weydale Quarry near that place, and sent by him to the Museum of Science and Art in Edinburgh. Mine were placed in the Jermyn Street Museum, London, and at once described by Mr Salter, and figured to illustrate a paper by Sir Roderick Murchison ... thus named after me". More generally, Peach's important contribution to Devonian palaeobotany was the recognition that plants previously considered to be aquatic, as for example by the Rev. John Fleming and Hugh Miller, were actually land-living forms (Jack and Etheridge 1877).

Another indication of Peach's status is evidenced by Peach's selection, by the early photographers David Octavius Hill and Robert Adamson, to sit for one of a set of calotypes of notable attendees apparently taken at the meeting of the British Association for the Advancement of Science at York in 1844 (Figure 1). Robert Chambers (1844, p. 323), the editor and publisher, and like Smiles an exponent of education and self-help, wrote:

"But who is that little intelligent-looking man in a faded naval uniform, who is so invariably seen in a particular central seat in this section [The Zoological Section of the BAAS]? That, gentle reader, is perhaps one of the most interesting men who attend the association. He is only a private in the mounted guard (preventative service), at an obscure part of the Cornwall coast, with four shillings a-day, and a wife and nine children, most of whose education he has himself to conduct."

Chambers's description shows that Hill and Adamson plainly did not dress Peach up in his coastguard uniform specially for the sitting, especially as it was more usual then than now for members of the Services to wear their uniform on public occasions. But it is worth remembering that Hill and Adamson would often dress up their subjects to convey what they saw as a deeper truth, however technically inaccurate the costume was for that place and time. For instance, their famous images of Hugh Miller (1802-1856) posed him as a shirt-sleeved stonemason working on a tombstone in the Calton cemetery, Edinburgh, although Miller had long given up such manual labour (except on his fossils!) for the life of an accountant and then a newspaper editor (Stevenson 2002, Taylor 2007). Miller's example suggests conversely that Hill and Adamson's portrayal of Peach as a coastguard was not intended negatively. Hill and Adamson were surely portraying Peach as a significant man of science worthy of such a record, but also as someone whose place in society was different from the elite gentlemen running the Association - but who was, presumably, due all the more credit for the scientific work he did manage to do.

Charles Peach: the Edinburgh years

Developing a timeline of Charles Peach's life allowed us to fit various disparate pieces of information into a synthesis of his fossil-collecting activities in Cornwall, northern Scotland and latterly around the city of Edinburgh. For the purposes of this paper, a key event came on 15 August 1861, when a Treasury Warrant basically did away with Peach's grade within the Customs service, and forced him into retirement, which he resented. Oldroyd (2004b) recorded that on his retirement, Charles Peach's geological work was primarily on palaeobotany and glacial geology, both based on his Caithness work, as evidenced by his published work at this time (Peach 1858a; 1859; 1860a; 1863). This was natural, for to begin with, Charles Peach remained in Wick after his retirement, and it was only in May 1865 that he moved south with his household to Edinburgh (Figure 2). Smiles (1878) recorded that being made redundant from his job had a depressing effect on Peach, who was also prone to colds and bronchitis, and who now suffered an extended period of illness. We do not know for sure what exactly ailed Peach, and for how long. The labelled and dated fossil plants in NMS which we have so far examined do show very little fossil-collecting during the period 1861 - 1865, but this may simply reflect the fact that most of his pre-1870 collection was sold, and also that during this period Peach was not living on the

Carboniferous strata whence the fossils described in this paper were drawn. We have not yet been able to explore fully those NMS collections, such as fishes, which do contain material from this period of his collecting and from the kind of strata (such as the Old Red Sandstone) on which he was living (for instance, at least one fish, NMS.G.1875.29.78, was labelled as having been collected from South Head, Wick, on 6 April 1863; see also the Old Red Sandstone plants enumerated below). It is already plain that it would be an exaggeration to suggest that Peach ceased his scientific work completely. He continued to send papers in biology (e.g. Peach 1860b) and geology (some read *in absentia*) to the Royal Physical Society of Edinburgh almost every year up to the late 1860s and beyond, as judged by the actual dates of the meetings in the Society's *Proceedings* (vols. 2 and 3). Moreover, in 1864 Peach took part in John Gwyn Jeffreys' dredging trip to the Shetlands, which had primarily biological aims and which Peach also took as an opportunity to investigate the local Quaternary drift fossils (Peach 1863a, 1863b). Inquisitive collectors often collect outwith their main fields of interest when opportunity presents itself and in Anderson (1865) we find evidence of Charles Peach doing just that. Referring to the archaeological excavation of a 'kist', i.e. burial cist, in a mound at Keiss, near Wick, the author noted:

"These hammers or pestles, of oblong shore pebbles, are found in the shell-heaps or connected with the dwellings, as well as in the kists; and the one sent by Mr. Peach from the "Pict's House" at Old Stirkoke, must have been intended for a child's hand." (Anderson 1865, p. 161)

Later in the same article Peach's contribution to excavations alongside the author is referred to in relation to finding human remains amongst the ashes, bones of animals and shells of a 'midden heap'. Although in both cases it is a "Mr Peach" who is referred to, we are reasonably certain this is Charles rather than any of the rest of his family, especially as the name Peach is very unusual in the area as the 1861 census shows. By 1862, Benjamin Peach was actively engaged in Survey work on the coalfields of Fife. The only other possibility is that Charles Peach's son Joseph could be the mentioned Mr Peach, but he would have been only about 24 in 1864 and we have no indication whether he was an active collector in his father's footsteps.

Peach was in any case in full action soon after the move to Edinburgh. The Edinburgh years constituted a fruitful period of field collecting and scientific investigation which lasted well into his eightieth year

in 1880. In 1866 Peach was recruited by the Edinburgh Museum of Science and Art (a precursor of NMS) to curate and display the Hugh Miller fossil collection, which it had acquired while still called the Natural History Museum in 1859 (Allman [1867]). Peach had paid tribute in one of his papers to Miller as "my late and valued friend ... one whom I have long loved" (Peach 1858b, p. 431), and his MS. catalogue of the Miller Collection still survives, while he would use Miller specimens in his own research (e.g. Peach 1873c). The connection between the Miller and Peach families was sufficiently strong for Charles Peach to be listed as one of the eight chief mourners at the funeral of Lydia Miller, Hugh Miller's widow, in 1876 (*Scotsman*, 21 March 1876). Peach was evidently paid (Anon. [1882]) for his cataloguing of the Miller collection, as well as for curatorial work at the Watt Institute, Dundee in 1873 (B. N. Peach 1883) (which may be when he noticed a particularly interesting lepidodendroid in that collection: Peach 1876a). And in September 1867 he attended the British Association meeting in Dundee. By now, Peach had plainly regained his fire and zeal for scientific investigation (if indeed he had ever lost them for long). In 1868, he was elected as an Associate of the Linnean Society of London primarily on the basis of his zoological observations on marine life around the British coastline (Davey 1911).

Peach did not confine his interests to the Edinburgh area. He published on fossil fishes from the northern Old Red Sandstone (Peach 1868) and would collect fish from the ORS near Melrose in Roxburghshire (Peach 1874b). He also returned to the theme of Cornish fossils in 1868 (Peach 1869; also pseudofossils, Peach 1870b). In May 1869, he spent two weeks at the Royal Institution of Cornwall in Penzance, in order to sort out, and provide identifications for, a collection of fossils held there since its purchase from him in 1849 (when he and his household moved to Peterhead: Crowther 2003, Peach 1870a, 1878b). In 1870 the British Museum bought a quantity of Peach's collection of Scottish fossils up until that time: but, as we shall see, not all of his Scottish material was sold to London. He kept back in reserve some material which presumably either duplicated that already being sold, or was of interest to him from a research or personal point of view. At least some of those latter pre-1870 fossils would eventually be sold to the Edinburgh Museum of Science and Art. But, in any case, the 1865 move and the 1870 sale did not see the end of his fossil-collecting activities. For Peach embarked on a new phase of work on the Carboniferous plants of the Midland Valley of

Scotland, which had started by August 1868 and continued after 1880.

It would not be surprising if the 1849 sale had to do with the move to Wick - partly to save on shipping costs and housing needs, and also to raise money to defray the expenses of the move. The NLS document ((NLS MS Ac 10073/6) p. 14) states the financial position he was in at the time quite clearly:

"While in the Coast Guard, his highest salary was £75 a year with £30 for the keep of a horse. If his horse died or became unserviceable it had to be replaced at his own expense. When changing stations a small allowance was made to himself only: nothing whatever was allowed for travelling expenses of his wife and family, or for the removal of his household goods."

There is no such clear link for an 1856 sale to the Jermyn Street Museum of the Geological Survey (Cleevely 1983), some years after the move to Wick, or for the 1870 sale, which took place after 1866, but it would be unsurprising if space at home were a factor. The British Census records everyone at a particular place on a particular night. On both 2 April 1871 and 3 April 1881, the census enumerators found Charles Peach and his wife Jemima at home at 30 Haddington Place, just off the thoroughfare of Leith Walk which connects the city centre of Edinburgh with the port of Leith on the Firth of Forth. They had been living here for most, perhaps all, of their stay in Edinburgh since the move of 1865 and would remain there until their deaths (death certificates; members' listing in the *Annual Report of the British Association for the Advancement of Science* for the 1866 meeting). The 1871 census caught daughter Jemima in the household of her sister at Arbroath; perhaps she was simply visiting - census data did not record who was normally resident, but simply who was present on the given night. She may well have been normally resident with her parents, for in 1881 she was with her parents, and a general servant, Mary Jane Johnston, on census night. This Haddington Place 'house' - to adopt Scots parlance - seems to have been one of at least 6 tenement flats in the block, in the usual Scottish urban manner often used to house the lower middle classes as well as the working classes. The 1881 census records some of his neighbours as including a teacher and a 'writer' or lawyer. The Peaches' youngest son, Benjamin, was at Douglas in Lanarkshire at the 1871 census, possibly on Geological Survey fieldwork, but the 1881 Census caught him living with his wife, four chil-

dren, young brother-in-law, and a servant at 8 Annandale Street, just around the corner from his parents. This was no doubt for mutual support of the aged parents and of a young mother whose husband was often away on fieldwork.

Ben Peach and his household were still in Annandale Street at his father's death (death certificate) but thereafter, possibly as a result of his remarriage, to Margaret Macewen, in 1887, they moved to rather more upmarket districts in south Edinburgh. The *Post Office Edinburgh and Leith Directory* for 1887 - 88 recorded Ben at 13 Dalrymple Crescent, Edinburgh. He was still there in the 1891 - 92 edition, but in the 1892 - 93 edition he was at 86 Findhorn Place, until the 1900 - 01 edition when he was now at 30 Mayfield Road, close by what was to become the site of the King's Buildings of Edinburgh University. Christine Thompson (pers. comm. 2007) informs us that when Ben Peach and John Horne led a field trip to their classic stamping ground of Assynt for the 1912 BAAS meeting in Dundee, and Ben Peach signed the Inchnadamph Hotel's visitor book, he gave his home address as 72 Grange Loan. Rather alarmingly the directories record Charles Peach as resident in Haddington Place up to the 1891-92 edition, but this is probably simply because Jemima remained there, as shown by the 1891 census, and the record of her 1887 sale to the Museum of a collection of Charles Peach's fossils, as will be seen below. She may well have moved to 86 Findhorn Place when her brother moved in around 1892, and was certainly resident there at her death in 1899 (death certificate; death notice, *Scotsman*, 2 September 1899).

The RSE document (Anon. [1882]) greatly amplifies our knowledge of Charles Peach's finances. In particular, his annual income, depending on the time, was between one and about two hundred pounds including allowances and minor income such as payment for being sub-consul at Wick for Norway and Sweden; his highest Customs salary was £150; he retired on a basic pension of £130; and although he owned his Edinburgh house it was still mortgaged for more than half its value. Even allowing for the fact that money had something like a hundred times its modern value, and that we don't know if he inherited anything from his parents, this was not a lot on which to bring up seven children out of nine to adulthood. This financial pressure did not abate when the children reached adulthood: clearly Peach was seriously worried about what would happen to his unmarried daughter Jemima who still lived with her parents when almost 50 and was financially dependent on them (possibly disabled by illness: the RSE docu-

ment refers to her as 'in delicate health' and her death certificate records her cause of death as 'Chronic Bright's disease [and] chronic diabetes'). In the will he made on 27 February 1882 he left his entire estate (in the legal sense) to her so long as she remained single; if she married (with the implication that her husband would support her), Ben Peach was to sell the estate and divide the proceedings between the siblings William, Ben, Elizabeth and Jemima (SC70/4/218 Edinburgh Sheriff Court Wills). Peach's estate was, in the end, valued at inventory at £571 16s 10d including payouts on life policies and £172 19s 6d for household contents and personal effects, including his 'Library & Collection of Minerals' (SC70/1/249 Edinburgh Sheriff Court Inventories). The 'minerals' we take to be lawyer-speak for fossils - minerals in legal parlance being anything that can be dug up for profit (Taylor and Harte 1988). It is pleasant to think that the £45 (see below) paid to her by the museum for what must have been those very fossils contributed to this aim, and in fact her finances remained sufficient for her to leave an estate valued at some £440 in 1899 (other than landed property, if any: SC70/1/383 Edinburgh Sheriff Court Inventories).

Peach's personal finance must always have affected his fossil-collecting, and like his periodic removals, pushed him towards selling his specimens. He was said, at least in later life, to have paid for the costs of his natural scientific interests solely from earnings from his geological work - collections sales, curatorial work, small grants from scientific bodies, and the like - without dipping into the household budget (Anon. [1882]). And it is very likely that sometimes he had to use money from the sale of fossils for family expenses, such as the removal from Cornwall to the far north, which was largely at his own expense (Smiles 1878, p. 251). However, as far as is known, he did not sell to private collectors, though the possibility remains that he kept quiet about any such sales. Finding a good home for his fossils in public collections, seeing them studied and published, helping his colleagues, and making a good name for himself must also have weighed with Peach alongside the simple cash price.

Peach's career also reminds us that selling one's fossils can have more indirect - but equally valuable - benefits than cash from outright sale (and further complicating the concept of 'amateur!'). One of Gideon Mantell's (1790 - 1852) motivations - or at least justifications - for his interest in palaeontology was to gain social status to boost his medical career (Dean 2004). He failed, as is well known. But one need only look at Charles Peach for a successful

exponent of the art of patronage, at least at a rather lower income level. His son Joseph followed his father into Customs work, and was recorded as a Clerk first at Wick in the 1851 census and then subsequently at Leith in the 1861 census, where he was serving when he died on 28 February 1868 of 'phthisis pulmonalis' (i.e. pulmonary tuberculosis) at the early age of 27, still resident at 30 Haddington Place at least in the last few weeks of his life (death certificate; will made on 17 February 1868, SC70/4/116 Edinburgh Sheriff Court Wills). Peach's own transfer to a better position within the Customs in 1845 was said to have taken place after William Buckland and the Council of the British Association requested the intervention of the Prime Minister, Robert Peel, while William Buckland obtained an annuity of £15 for Mrs Peach from a fund controlled by Mrs Peel; moreover, Peach himself wrote to Henry De la Beche, then Director of the Geological Survey, in 1840, 1845 and 1846 seeking just such influence (Anon. [1882]; Sharpe and McCartney 1998, pp. 26-27, 85; Oldroyd 2004b). In 1850, also, Charles Peach attempted to secure De la Beche's and also Andrew Ramsay's influence in getting another of his sons, William, a position as a fossil collector in the Geological Survey (letter to De la Beche, 23 September 1850: Sharpe and McCartney 1998, p. 85). However, William eventually ended up as a Customs Clerk, no doubt with his father's help (Appendix 1), while a later Director, Roderick Murchison, arranged for Ben to attend the Royal School of Mines and, in 1862, to take up a position with the Geological Survey. This was initially in London but soon Ben Peach was moved to Scotland, tasked with examining the coalfields of Fife and Clackmannanshire (Oldroyd 2004a). And in 1867, Sir Archibald Geikie, the Director of the Scottish branch of the Geological Survey, appointed Ben Peach as the Northern Area Geologist. Were it not for Charles Peach's association with Murchison in the North-west Highlands, and his good work in adding to the fossil riches of our museums, his son Ben Peach might neither have entered the Survey nor made his great researches with John Horne.

Plainly Charles Peach could not easily accumulate a large collection, given his household situation. And whatever pangs - if any - he might have had at seeing his finds go to museums, he did at least have other satisfactions and rewards. It is instructive to compare Peach, not just with Mantell, but also with Hugh Miller. In complete contrast to Mantell, Miller was almost obsessive in his independence from the great of this world, insisting on making his own way in life (apart from - and probably because of - one or two abortive early attempts: Taylor 2007). It would not

be surprising if Miller was just the same in geology. It seems no coincidence that Miller kept most of his collection for his all too short life, apart from a few specimens going to museums in London, Newcastle, Paisley and Inverness (Cleevely 1983). And as for poor Robert Dick, he was too embroiled in his declining bakery, and perhaps by then also too socially alienated, even to escape. To stave off bankruptcy, Dick had to sell his collection to the lawyer and geologist John Miller (d. 1878), into whose collection (also in NMS today) it was unrecognisably incorporated, except for some specimens which Dick gave to Hugh Miller and which can be identified from the latter's books. Thus Dick's bankruptcy lost him not only his fossil collection but also his very name on the specimens he found. By contrast, Peach was a civil servant dependent on the favour of the great and the good, and their patronage was a fact in Peach's life. At least he realistically turned it to some use.

Materials examined

As far as fossil collections are concerned, this study is based wholly upon those held by National Museums Scotland (Edinburgh). Fossil specimens cited are indicated by the standard MDA prefix 'NMS', and sub-prefix G, originally for Geology, within the fully modernised NMS documentation system. Unfortunately it is sometimes also necessary to use the Z for Zoology prefix because of a problem in converting the number to the standardised modern format. During the first half of the twentieth century, the RSM effectively operated separate departments of Natural History and of Geology, each running its own register numbering system, but both collecting fossils. This led to considerable potential duplication of acquisition numbers once the palaeontological collections of Natural History were transferred into Geology in the mid-20th century, and a headache for the modern curator trying to fit them into a single consecutive machine retrievable numeric system. To avoid this, therefore, Charles Peach's collection is variously attributed an additional G. (Geology) or Z. (Zoology) letter after the NMS prefix, depending in part on the department in which it was originally registered. Material within the care of the Science and Technological History Department is prefixed 'NMS.T.' The source of our study material therefore consists largely of the following accessions:

- NMS.G.1875.29 is a collection of 230 "British Fossils" purchased from Mr. C. W. Peach, Edinburgh for the sum of £50, "embracing a large number of

specimens of great rarity and importance" as the Annual Report had it (Traquair and Archer [1876]). The first 22 specimens are all fossil plants collected from West Lothian. The main body of the collection consists of fossil invertebrates from the Cambrian of Durness, Sutherland, Devonian fish from Caithness and the Midland Valley of Scotland, Carboniferous fish from localities around Edinburgh, and some Jurassic fossil invertebrates from Collyweston, Northamptonshire.

- NMS.G.1877.22 is a collection of 14 fossil fishes presented by Charles W. Peach.

- NMS.G.1887.35 comprises "a collection of fossils from the old red sandstone and carboniferous rocks of Scotland" (Traquair [1888]) sold by Miss J. M. Peach of 30 Haddington Place - i.e. Charles Peach's daughter, and no doubt as part of the clearout after his death. This collection was not properly registered at the time or since, and it is likely that at least some of the mass of originally unregistered Peach Collection fossils held in NMS originates from this acquisition.

- NMS.Z.1951.4 is a gastropod of the species *Platyschisma simulans* from the Silurian of Lesmahagow.

- NMS.Z.1951.5 is a specimen of the trilobite *Dalmanella budleighensis* from near Gorran Haven, Cornwall - presumably a specimen which he had retained or collected subsequent to the sale of his other Cornish fossils to the Royal Geological Society of Cornwall museum in Penzance.

- NMS.G.1958.8 is a specimen of the Carboniferous bivalve *Aviculopecten ellipticus* from Lesmahagow, Lanarkshire.

- NMS.G.1959.15 represents a reassignment of certain Palaeobotany collections previously numbered in a separate palaeobotanical register; some of this is Peach material.

- NMS.G.1962.10 consists of material that was found unregistered in the general palaeobotany collection but which Dr Charles D. Waterston (then, in 1962, Keeper of Geology) recognised as being from C. W. Peach's collection from its distinctive labelling style.

- NMS.G.1964.13 is the counterpart of the holotype of the Old Red Sandstone plant *Caulopteris peachii* Salter in Murchison (1859).

- NMS.G.1967.31.6, 7, 9, 11, 13-16 are specimens of the eurypterid *Erettopterus bilobus* from the Silurian of Lesmahagow.

- NMS.G.1973.57.1-47 is a collection of shells from the boulder clay of Caithness, found unregistered in the collections.

- NMS.G.1981.3 comprises a collection of Lower Carboniferous plants from the Midland Valley of

Scotland, found unregistered in the collections but almost all from Charles Peach's collection.

- NMS.T.1999.44 comprises Charles Peach's recently acquired microscope and associated items including a hand-illustrated notebook and glass microscope slides (many of which pertain to marine biology rather than geology).

- NMS.G.2007.28 (ex collection of C. W. Peach) is a newly accessioned lot which encompasses all the microscope slides found previously unregistered in the NMS palaeobotany thin section cabinet.

Of course, the later, retrospective, accessions doubtless include material which 'should' come under the original acquisitions, especially the 1887 one, but cannot now be positively linked to them.

Stace *et al.* (1987) listed the following entries for collections relating to Charles Peach held within the then Royal Scottish Museum Geology collections (now NMS):

- Carboniferous fossil (1) from Lanarkshire (this is the *Aviculopecten* listed above).
- Approx. 500 Devonian and Carboniferous fish from Scotland and England.
- 3 Ordovician fossils from Cornwall.
- 47 fossil shells from the Boulder Clay of Caithness.

The recognition of this sizeable palaeobotanical collection held at this institution adds an important record to this list, both in terms of subject matter and sheer quantity. Further odd candidate specimens continue to turn up and to need assessment, but we believe that we have located the bulk of this plant material, in the form of some 300-odd macrofossil specimens (mostly Carboniferous with a few Devonian and Jurassic plants) and a number of mounted thin sections constructed by Peach himself.

Peach's Collecting Localities

Peach's palaeobotanical collection held at NMS predominantly consists of Carboniferous fossils, reflecting his proximity to nearby localities and therefore collecting opportunities during the period 1865 - 1886. However, a small proportion of Devonian and Jurassic fossils augment this main body of the collection. Lower Devonian fossil plants are represented by a suite of 10 specimens from Turin Hill, near Forfar, collected on the "10th of October 1871" [Tuesday]. These may indicate a link to local fossil collectors in that area whom Peach may have met at the 1867 BAAS meeting in Dundee - the Turin Hill locality was the collecting patch of the local

landowner, Mr James Powrie (1815-1895) of Reswallie (Davidson and Newman 2003), who was also Vice-President of the EGS at the time Peach was an Associate. The Middle Devonian plants originate from a variety of localities in Caithness and Orkney but do not always have associated find date information: Castlehill, Thurso (NMS.G.1959.15.53 - 4 November 1861), East Mey, Thurso (22 May 1857), John o' Groats, Thurso, Island of Stroma (24 June 1859 - NMS.G.1959.15.71; 19 June 1863), Ackergill Castle, Wick (NMS.G.1959.15.60 - 18 September 1858), Harland Wick (NMS.G.1959.15.50, NMS.G.1959.15.61), Thurso, Canis Bay (NMS.G.1959.15.77; 23 July 1862) and Dale Quarry, Stromness, Orkney (NMS.G.1959.15.75, NMS.G.1959.15.78). Some of those dateline points indicate that Peach visited and collected from some Middle Devonian sites in Caithness and Orkney after his retirement but prior to his move to Edinburgh in 1865.

Two important questions are when Peach first started his system of annotation, and when he started using it systematically (if this was later). The earliest fossil plant displaying this form of labelling was collected on 22 May 1857, but it was only after Peach ventured amongst the Carboniferous fossils in the neighbourhood of Edinburgh that the usage becomes regular, at least as far as the plants are concerned. Possibly this reflects the sheer volume of material he was now collecting. However, another interpretation is that he had been advised, perhaps by a fellow palaeontologist or a previous purchaser, as to good practice in labelling which could increase the scientific and monetary value of his finds. One such occasion relating to improved labelling and documentation could well be the purchase of some of his collection by the Geological Survey in 1856. But it is possible to point also to his more general association with Survey workers - not least his own son Ben who would have been heavily indoctrinated with Survey practice at the School of Mines, which Ben attended in 1860-61, even before starting at the Survey. The Survey had found during the 1840s that they could better do the job of collecting by ensuring that appropriate information (for their purposes) was gathered with the fossil at the same time (Knell 2000). One interesting point, however, is that Peach never seems to have adopted a continuous numbering system for his own collection. Was this because he was accustomed to seeing chunks of it move on to other homes? It cannot be out of ignorance as he was, during his Edinburgh years, carrying out just such a numbering scheme on the collection of Hugh Miller. Indeed, this curatorial work may well have acted to

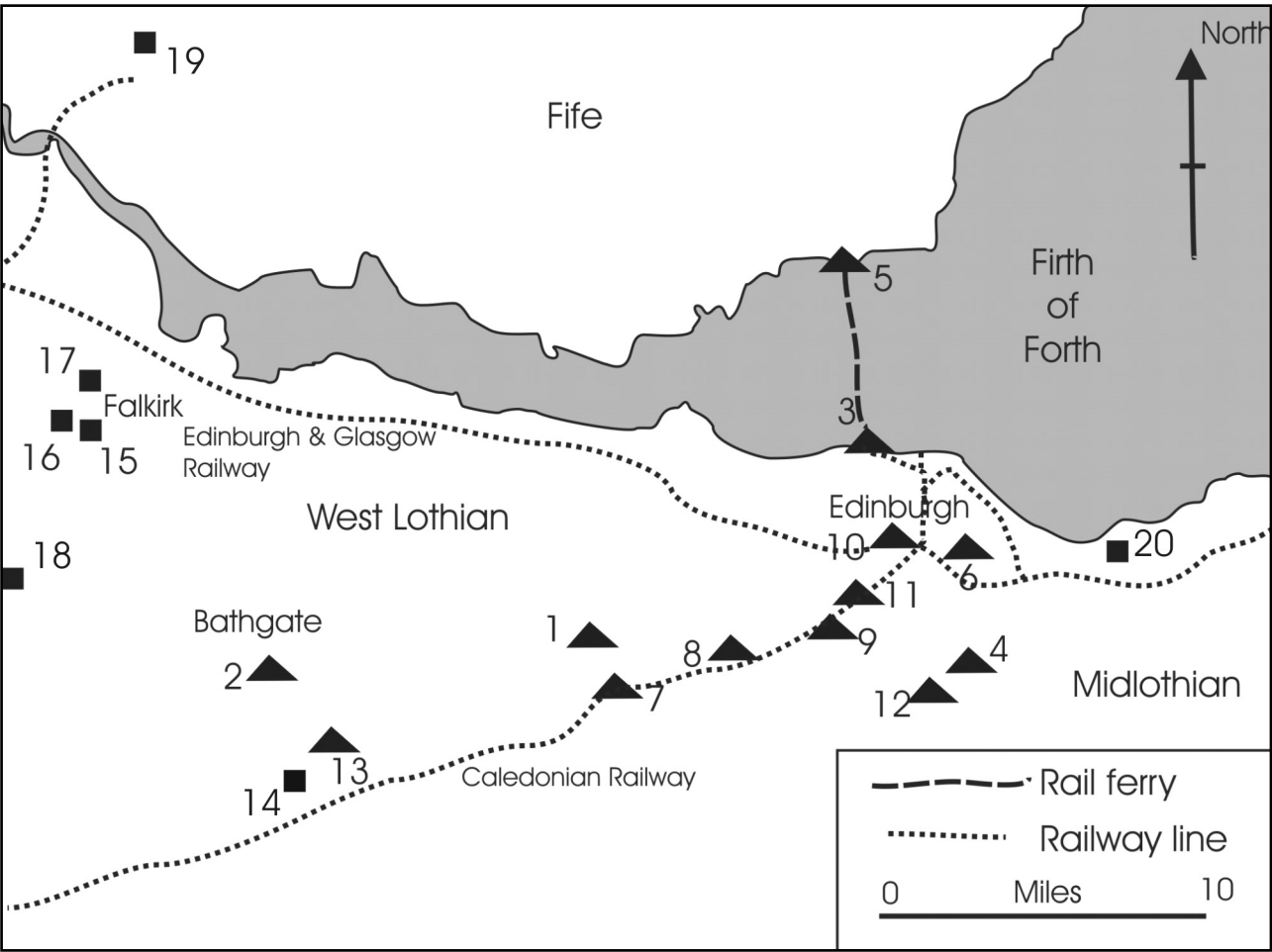
reinforce the link with Survey practice given that the Survey in Scotland was, right from the start, associated with the Museum, with its offices just round the corner on George IV Bridge, and its collections housed and largely displayed in the Museum until 1950 (though legally and, to begin with, practically and physically separate from the Museum's own collections: Flett 1937, Allan [1951], Waterston 1997). This was doubtless partly for administrative convenience - both were initially part of the Department of Science and Art of the Civil Service - but it must have facilitated any interplay between their respective staffs.

The anomalous Jurassic fossils are surprisingly simply explained: they were collected from Collyweston and from Sheep End Pit, Wansford near Northampton, on 29 September 1875, the eve of Peach's 75th birthday. No doubt he was attending a family gathering in his honour and took the opportunity to collect in the area of his childhood (or, possibly, purchase them from the local quarrymen): only to be expected of such a keen fossil collector - and a birthday treat in its own right.

Localities in the Carboniferous

The Upper Carboniferous (Pennsylvanian) and Lower Carboniferous (Mississippian) are both exposed in close proximity to the city of Edinburgh (Figure 3). On modern interpretations, the Lower Carboniferous sediments of the Lothians were laid down in an extensive inland body of water known as Lake Cadell (Loftus and Greensmith 1988) whose shoreline was fringed with coal-producing swamps.

Figure 3. Locality map of Carboniferous localities from which Charles Peach collected. Lower Carboniferous localities are denoted by triangles, Upper Carboniferous by squares. Numbered localities on the map are identified as follows: 1. Addiewell, Stoneyburn, west of West Calder; 2. Bathgate, West Lothian; 3. Battery near Granton; 4. Burdiehouse Quarry; 5. Pettycur, Burntisland, Fife; 6. Camstone Quarry, Arthur's Seat, Edinburgh; 7. Currie railway cutting; 8. Camps Quarry, East Calder, West Lothian; 9. Colinton railway cutting, Edinburgh; 10. Lochend Quarry, Edinburgh; 11. Slateford railway cutting, Edinburgh; 12. Straiton, Midlothian; 13. West Hermand, West Calder, West Lothian; 14. Black Rig, Slamannan, West Lothian; 15. No. 1 Station Pit, Falkirk; 16. Brickworks, Falkirk; 17. Shieldhill Burn, Falkirk; 18. The Cleuch, Falkirk; 19. Devonside, Tillicoultry, Clackmannanshire; 20. Musselburgh Old Pit, Midlothian.



These sediments included freshwater limestones, oil shales, and at least one centre of volcanic-related hot spring activity, the East Kirkton limestone (see Rolfe *et al.* 1993) which was known from the time of Scouler in 1831 as recorded by Hibbert (1836). Upper Carboniferous sediments comprise the filling of the Midlothian coal basin, a large synclinal feature whose axis runs broadly SSW - NNE. Much collecting effort had already been concentrated on the Carboniferous in the immediate vicinity of Edinburgh by Peach's friend Hugh Miller (Anderson 2005), and other workers, as the Nature obituarist (Anon. 1886, p. 447) noted, but Peach extended discovery still further,

"... devot[ing] himself with all his old enthusiasm to the exploration of the fossil flora of the Carboniferous rocks of that neighbourhood. Nothing seemed ever to escape his notice, and hence even from the quarries and sections where many a practised eye had preceded his own he was able to glean materials which no one but himself had noticed."

Peach visited sites such as the Granton and Craigleith quarries to the north-west and the Burdiehouse mines to the south of the city (all now within the present city boundary). Importantly, though, Peach widened his net of enquiry and palaeobotanical digging beyond the immediate vicinity of the city. This seems to have been facilitated by the growing network of railways serving the towns, industries, and extractive workings for coal, ironstone, lime and oil shale in the central belt of Scotland, for his collecting explored the area particularly to the west of Edinburgh in West Lothian. Tables 1 and 2 list these various localities and the dates on which Peach recorded collecting specimens from them.

Patterns of Collecting

The Upper and Lower Carboniferous localities can be broadly grouped into three main collecting areas namely: Edinburgh city and environs; West Lothian; and Fife and Clackmannanshire to the north of the Firth of Forth. The fossils collected from around Edinburgh are relatively easy to explain; these represent Charles Peach's home collecting patch at the time, within walking distance helped by a bus or tram. Those in West Lothian are located further away, but were still reachable by way of a short train journey from the city of Edinburgh. The Fife and Clackmannanshire fossils were also reasonably easily reached by ferry and train. Moreover, they may reflect a collecting link with his son Ben Peach, who had been tasked with mapping the coalfields of Fife. We conjectured that either his father Charles tagged

along on Geological Survey fieldwork in the area (not outwith the bounds of possibility considering his previous association with Murchison), or simply that they conversed on the latest findings providing Charles Peach with an up to date knowledge of active mining in the area and possible sources of fossil plant material, as well as contacts to exploit where permission was needed. This turns out to have happened around Falkirk, Stirlingshire, where Ben "pointed out the most likely spots" and where Peach benefited from the "great kindness of all connected with the ... coal-works, for so freely doing all in their power to help him in his pursuits" (Peach 1873a).

Of course, even a sprightly sixty- or seventy-something-year-old like Charles Peach would need cheap transport to get to where he could collect. With the development of the growing British railway network arrived new opportunities to investigate newly blasted and dug sections through the bedrock of the region, but - just as important - also to travel more widely without needing one's own horse or private road vehicle. Freeman (2001) describes in detail the use made of railways in the development of geology at this time (also Allen 1994). The relative smallness of Peach's pension suggested to us that this practical issue of regular and convenient access at low cost might have had a real bearing on his interest in Carboniferous fossils. Peach's collection in NMS apparently has few or none of the fossils of the Silurian inliers in the Pentland Hills to the south of Edinburgh, and it is probably no coincidence that these sites were some miles' trek from the nearest railway station, which was on a quiet branch line. By contrast, the mineral wealth of the Coal Measures, and also the limestones, and the associated growth of industry and population, ensured a dense railway network over much of central Scotland. The distribution of Peach's sites does indeed show a striking coincidence with the main line railways, right down to the furthest reaches in Fife and Clackmannan. To reach the Pettycur site in Fife, for instance, Peach only had to walk less than a kilometre from home to Scotland Street Station in north-central Edinburgh, whence he could catch the train from central Edinburgh to Dundee in those days before the opening of the Forth Bridge (Marshall 2001). This would bring Peach to Granton Harbour, and a connection with the passenger ferry steamer across the Forth to Burntisland, whence he could get to Pettycur by way of a brief ride on the connecting train to Kinghorn station and a short walk, or by a longer walk from the ferry terminal. Peach is known to have taken at least one geological holiday as when he stayed in Falkirk for "change of air, as well as for the purpose of a search in the coalfields for fossils" (Peach 1873a).

<u>Locality</u>	<u>Date</u>	<u>Day</u>
Addiewell	25 April 1871	Tuesday
Bathgate, West Lothian	October 1871	[no specified date]
	28 June 1872	Tuesday
Battery near Granton	16 June 1877	Saturday
Burdiehouse	17 October 1868	Saturday
	13 April 1870	Wednesday
	22 July 1876	Saturday
	1878	[no specified date]
Burntisland	20 June 1876	Tuesday
	7 October 1876	Saturday
	9 October 1876	Monday
	23 August 1878	Friday
Burntisland (Grange Quarry)	1868	[no specified date]
	1870	[no specified date]
	1872	[no specified date]
	1876	[no specified date]
	1878	[no specified date]
	12 September 1880	Sunday
Camstone Quarry, King's Park		
Currie railway cutting	15 July 1871	Saturday
Camps Quarry, East Calder	18 May 1878	Saturday
Colinton railway cutting	1874	[no specified date]
Lochend Quarry, Edinburgh	19 December 1870	Monday
Slateford railway cutting	1 September 1871	Saturday
	18 September 1868	Wednesday
Straiton, Midlothian	28 September 1868	Monday
West Hermand – West Calder	28 May 1874	Thursday
	20 June 1874	Saturday
	28 June 1874	Sunday
	20 July 1874	Monday
	10 May 1876	Wednesday
	28 June 1876	Wednesday
	6 July 1876	Thursday
	8 July 1876	Saturday
	10 July 1876	Monday
	27 July 1876	Thursday
	1 August 1876	Tuesday
	23 August 1876	Wednesday
	16 October 1876	Monday
	6 October 1876	Friday
	6 September 1877	Thursday
	18 October 1877	Thursday
	8 May 1874	Friday
	2 May 1884	Friday

Table 1: Lower Carboniferous localities visited by Charles Peach and collection dates.

To assess practicalities further would need minute investigations of the contemporary timetables (especially for day trips) and fares - though we have not so far found any family members living in the relevant areas who might provide cheap accommodation. But it is worth remembering that railway companies were obliged by Acts of Parliament to provide at least one 'Parliamentary' service a day in each direction on each line, with a fixed fare of one (old) penny a mile, as well as any other cheap fares they thought fit to offer, for instance in 'workmen's specials'.

also Table 1; Slateford cutting was already in existence on the main line, it seems, hence the 1868 date). This particular line went through one tunnel and a number of cuttings. Cuttings then and now tend to be best examined just after they have been dug. With time, vegetation growth and weathering can obscure outcrop surfaces, and it is clear that Peach visited the sites when they were fresh.

Peach also used upcast material from diggings, at least on occasion (though this one perhaps should be

Railways also, of course, provided cuttings which often had continuous stretches of exposure along their lengths, although tunnels tended to have a brick lining on the inside preventing the inquisitive geologist from collecting there - quite apart from the obvious practical problems and hazards, such as being run over like Hugh Strickland! Another hazard, for those without the access rights of the Geological Survey, was prosecution for trespass on railway company property, under the usual bye-laws obtained by the companies, and Peach would presumably need to obtain permission in advance. Peach's plant collection explicitly lists three railway localities of this kind within the (present) city of Edinburgh, namely railway cuttings at Colinton, Currie and Slateford. This combination immediately suggested that Peach was collecting from the works on the Caledonian Railway's Balerno loop line through Colinton and Currie, off its main Edinburgh-Carlisle line at Slateford (itself already on the main line, and therefore easily accessible). Peach mentions 'Currie new railway' in one paper and 'Colinton railway' in another (Peach 1879, p. 46; 1873b, p. 324). This was indeed opened in 1874 on 1 August (Shaw 1989), after a long construction period, matching the 1871 and 1874 dates on two such 'railway' specimens (see

<u>Locality</u>	<u>Date</u>	<u>Day</u>
Black Rig, Slamman	5 September 1871	Tuesday
	15 September 1871	Friday
Devonside, Tillicoultry	21 September 1871	Thursday
Musselburgh (Old Pit)	24 August 1868	Monday
The Cleuch, Falkirk	22 August 1870	Monday
	22 September 1870	Thursday
	23 September 1870	Friday
	24 September 1870	Saturday
	3 June 1871	Saturday
	17 May 1871	Wednesday
No. 1 Station Pit, Falkirk	August 1870	[no specified date]
Brickwork, Falkirk	1870	[no specified date]
Shield Hill Burn	1870	[no specified date]

Table 2: Upper Carboniferous localities visited by Charles Peach and collection dates

filed under 'quarry' rather than 'public railway'): in May 1874 he found *Sphenopteris affinis* in the "blaes" used to make the formation for a small internal railway for a new oil-shale pit at West Hermand, near West Calder" (Peach 1878a, p. 131; see also Peach 1876b; blaes is a Scots word for hardened clay or somewhat carbonaceous shale: *Chambers Dictionary*).

The pattern of collecting is, however, mildly surprising in that it shows Peach occasionally braving the Scottish Presbyterian Sabbath to collect fossils on a Sunday. This would no doubt have shocked Hugh Miller, that staunch Free Kirker, had he still been around (Knell and Taylor 2006; Taylor 2003), although the ways of the worryingly Godless industrial districts of central Scotland were perhaps not so strict as in the stern rural North. Robert Dick did collect on Sunday, but he had no other free day, and was notably bloody-minded, as well as alienated from his Caithness community (Smiles 1878, pp. 267-269).

We do not, in fact, appear to know anything about Peach's religious views, other than a rather equivocal fragment in a letter he wrote to Charles R. Darwin on 1 May 1871:

"I have read your last work on the 'Descent of Man' & your two former ones. My son and self possess them - we have them of our own, so that we may take our time and read, mark and crease, & inwardly digest & I am happy to say it does not hinder our digestion or make us unhappy. We take to it kindly & consequently get ourselves - at times - snubbed & even take this kindly. I find people are constantly talking 'Darwinism' (excuse the last word) and do not know it, & when I catch them at it, I quietly help them on & do not let them know that I am doing so. With the "unco guid" I've another way - I quietly ask them

whether "they expect when they die, to be, far higher & more glorious etc. in the next world". "Yes of course" they say - "Well then is it more difficult for God to bring us from a lower form, than it is to make us a higher when we have done with this world". They try to shuffle, but I pin them to it & you would smile to see how puzzled they are." (CUL DAR 174)

This only really indicates Peach's views on evolution. It cannot be assumed to indicate his views on religion, given the wide variety of Christians who accepted evolution with or without natural selection - although it is pretty obvious that Peach presumably did not subscribe to the more extreme or more literally minded views of the 'rigidly righteous', to quote from Robert Burns' poem *Address to the Unco Guid, Or the Rigidly Righteous*. This is whence Peach's expression came, perhaps directly - 'unco guid' being Scots for 'uncommonly good'. Peach's biographers, including Smiles, are silent on Peach's religious views, suggesting that Peach's feelings one way or another were not notable, at least by the then conventional standards. Smiles, a Scot then safely across the border in England, was not shy of noting Dick's heterodox views on the Sabbath and how he expressed them to Peach - to whom, perhaps revealingly, Dick complained about his compatriots' views on his own country walks on Sunday (Smiles 1878, pp. 155-158, 267-269). But it should be remembered that Smiles normally refrained from discussing his subjects' religious views (Jarvis 1997). Jarvis argues, we think correctly, that Smiles' unhappy experiences of organised religion, especially the more severe end of the Scottish Presbyterian spectrum, led him to a discussion of Dick's views which was in itself unusual but did enable him to retaliate by portraying the local unco guid as Pharisees who contributed to Dick's martyrdom.

It may or may not be significant that Peach's son, the first Benjamin, was christened at the Presbyterian Higher Meeting at Sidmouth, Devon (see appendix); it may simply have reflected his wife Jemima's wishes rather than his. Peach 'though reared in an inn ... abstained from liquor for the rest of his life' (Smiles 1878, p. 241; however, 'liquor' might refer only to strong drinks such as brandy and this does not necessarily exclude the temperate use of weak drinks such as ale). However, this is not in itself conclusive evidence of Nonconformism. As Smiles suggested (but declined to state outright), it may simply have been Peach's reaction to his upbringing in the Wansford village pub, where he refused drink as a child. Alternatively, we suggest that it was linked to his employment in the Revenue Coastguard Service - either a reaction to the ne'er do well characters he encountered (and sometimes fought) whilst on active duty or simply a common-sense precaution given his position and the illicit source of much of the liquor available in the countryside. But, in any case, Peach would have been born and bred into at least some of the lax ways of the English, who, as Miller sardonically noted (Taylor 2007), all too often tended to devote Sunday to fishing and lolling on the grass, and drinking ale with their plum pudding.

In the following section, we make some preliminary observations on some of the localities represented and their wider relevance to palaeobotany.

Edinburgh city and environs

Due to the subsequent development and growth of the city of Edinburgh, Peach's localities cannot all now be visited (or sometimes even accurately fixed). For example, the Craigleith Sandstone quarries are now filled in and the site of an outlet of a major supermarket chain (McMillan *et al.* 1999), while the Granton quarries were overtaken by flooding and industrial development. However, some localities associated with the seemingly eternal landscape of the city can still be visited. In particular, Peach collected fossil plant material from quarries on the flank of Arthur's Seat as well as close to the present day Holyrood Park.

● **Craigleith** - Sixteen glass-mounted ground sections (one dated 17 May 1873) from this locality are amongst the microscope slide collection. The Craigleith sandstone quarries sourced much of the distinctive building stone for the city of Edinburgh including Holyrood Palace and Edinburgh Castle (McMillan *et al.* 1999). During their operation, the workings often revealed *in situ* permineralised tree trunks and these palaeobotanical peculiarities drew

attention. The fossil tree trunk which sits in the gardens directly outside the Natural History Museum, London, is today perhaps the best known example from Craigleith. Another, situated outside the buildings of the Royal Botanic Garden Edinburgh, appears to be the famous tree of 1830. When this was discovered, part went to the Garden and part to what was then the Natural History Museum of the University of Edinburgh (College Museum acquisitions register, item 26 for 1831-32, NMS Library). This latter part was moved to the new Museum somewhat belatedly in 1869, and set up on display in an outdoor enclosure at the front (*Scotsman*, Thursday 8 July 1869). Subsequently the Museum portion was moved to the Botanic Garden and reunited with the rest of the tree, apparently in late 1873 or 1874, we suspect as a direct result of the renewed interest in those trees as the result of new finds in 1873 (Anon. 1874, Christison 1874). Peach had obtained a fragment of the 1830 tree, which he subsequently polished on the 17 May 1873 [Saturday] (lowermost image, Figure 4), as part of a compara-

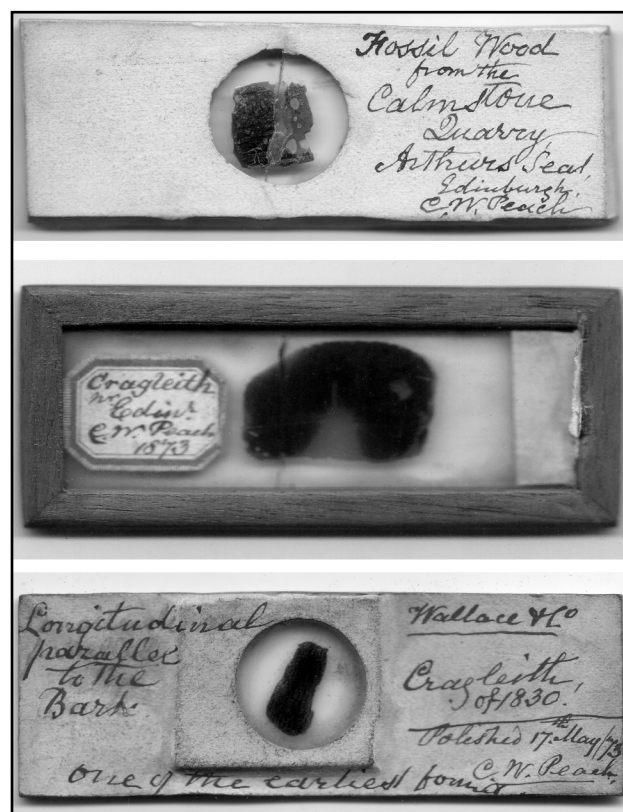


Figure 4. Three hand-made microscope slides varying in size, material of construction and labelling style assembled by Charles Peach. The upper slide is a ground section of fossil wood from Arthur's Seat in the city of Edinburgh. The middle slide has a wood frame and a characteristic handwritten ink inscription on an irregular octagonal paper label. The lower slide documents a section of fossil wood from the original 1830 tree hand polished by Charles W. Peach on 17 May 1873.

tive study of several trees from Craigleith and elsewhere in the district (Peach 1873d). This may well be one of the 'several sections' which Peach exhibited at a meeting of the Botanical Society of Edinburgh and which he had 'made from portions of the tree found in 1830, given to him by Mr Forbes, the representative of WALLACE & Co., marble masons...' (Peach 1873d). Wallace & Co. may have been involved in the work of removing the Museum section of the 1830 tree and reassembling it at the Museum in 1869, or at the Botanic Garden, or both. How Peach's other sections fit into the story - and what information they hold for modern researchers - still remain to be seen. A complication is that two trees were publicised in 1873, one originally discovered in 1854 (or 1858?) and re-excavated that year (apparently that in London), and a rather smaller second example (for this and the complex story of the Craigleith and other local fossil trees, see e.g. Anon. 1874, Christison 1874, Edwards 1932, Long 1979, and Witham 1834; Mr Graham Hardy [pers. comm. 2007] kindly advises us that the RBGE Archive also holds letters to and from Professor John Hutton Balfour concerning the Craigleith Trees, e.g. John Hutton Balfour Correspondence Volume III. Letters C109-110, C112-117, RBGE).

- **Arthur's Seat** - This dominating landmark within the city of Edinburgh is the core of a Carboniferous volcanic centre. Unsurprisingly enough for a geological feature sat so prominently in the Edinburgh skyline it has attracted the attention of numerous geologists over time and is indeed still used as a field excursion locality for undergraduates at the University of Edinburgh. Herbert (2005) noted that Charles Darwin as an undergraduate attended a practical field excursion to the area given by Professor Jameson here, and he was later to return to the site after his experiences in various South American volcanic landscapes on the 'Beagle' expedition. Three of Peach's glass-mounted thin sections of ground and polished fossil wood were derived from the environs of Arthur's Seat. A further five sections are identified as coming from Camstone Quarry (Peach variously spelled this "Camstone" or "Calmstone" as can be seen in Figure 4). Peach's interest plainly lay in the plant fossil-bearing sediments surrounding the volcanic complex rather than the igneous rocks themselves. These sediments of the Lower Carboniferous Cementstone Group often yielded permineralised plant remains (presumably as a result of circulating hydrothermal waters associated with volcanic emplacement).

- **Musselburgh Old Pit** - Coal mining in this area exploited rocks of Upper Carboniferous age. Hugh Miller's equivalently aged collections from the

Musselburgh area originated from rocks on the shore section (Anderson 2005). This presumably indicates that Charles Peach was investigating a locality that was either newly opened or reopened since 1856, or that he had obtained permission and access to collect there, where others had not. Alternatively, it could just be a geographical description rather than a true locality name.

Fife and Clackmannanshire

The Fife localities are dominated in the collection by those exposures close to the south coast of the region at Burntisland and Pettycur. Here, to the present day, permineralised plant fossils associated with volcanic tuffs and ash beds outcrop on the beach.

- **Pettycur** - This Lower Carboniferous (Mississippian) locality near Burntisland in Fife [GR NT261862] is now renowned for its permineralised plants preserved in volcanic ash (Gordon 1909; Rex and Scott 1987). The Peach collection contains 30 glass slides of varying shapes and sizes, and not of standard thin section dimensions (i.e. 76 x 26 x 1mm), with attached ground sections of permineralised plants (Figure 5). This suggests that they were prepared by Peach himself as either specimens or materials became available, given the 1871 date on the slides. Possibly Peach was responding to the first reports of anatomically preserved plants from Pettycur by the eminent palaeobotanist W. C. Williamson (1871) onwards. Or alternatively, he may have had a hand in the initial discovery of the site. Even within a range of the hand-made glass slides, there is variation in the naming of the locality employed varying between 'Petticur' and 'Pettycur'. Present-day maps use the latter spelling, but local use tends towards the former.

West Lothian

The West Lothian localities all appear to be on the site of active (at that time) mining activities for either coal or oil shale. For instance, Addiewell (Locality 1 in Figure 3) is where in the 1860s, James 'Paraffin' Young built a refinery to exploit the local oil shales (Butt 2004). Interestingly, the NMS register records that "Messrs. Galletly and Lumsden, oil shale works ... Addiewell", presumably the managers, donated 10 fossil plants in 1875, which suggests the possible present-day location of those specimens described by Peach (1876c); this material may be, or in addition to, the collection held at 'Young's Oil Company' at Addiewell mentioned by Thompson (1880) who also figured at least one specimen from Peach's collection.



Figure 5. Above. Hand-made glass-mounted thin sections of Pettycur plants, demonstrating the variation in size and shape of the objects. The writing in ink is in Charles Peach's hand. Note also the variation in spelling of the locality name 'Pettycur'.

Figure 6. Below. Face and reverse of paper documents accompanying the palaeobotanical thin sections with Charles Peach's identifications and notes. Those confirm that the thin sections in the collection relate to Charles's handiwork.

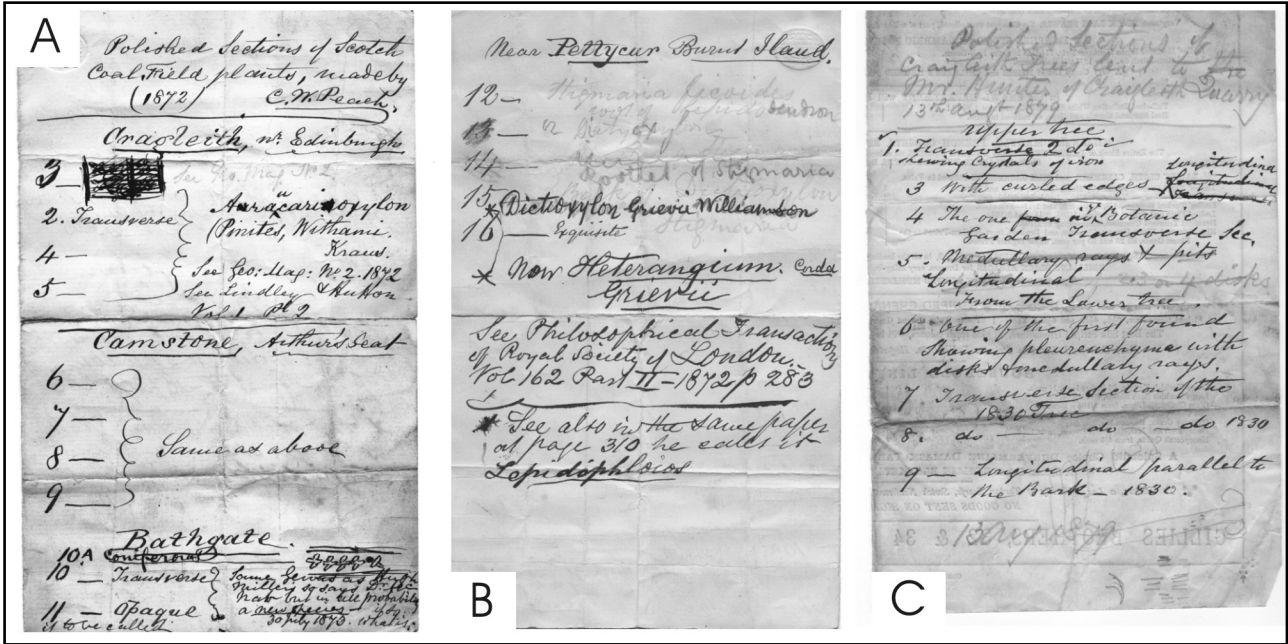




Figure 7A-F. Glass-mounted 'palaeoherbarium sheets' of Lower Carboniferous plants from West Lothian. A. NMS.G2007.28.7; B. NMS.G2007.28.1; C. NMS.G2007.28.4; D. NMS.G2007.28.6; E. NMS.G2007.28.3; F. NMS.G2007.28.2.

The West Hermand - West Calder localities appear to have received by far the most intensive fieldwork effort. This repaid Peach in that his efforts in the field, and the collections that he assembled, once more attracted the attention of other workers in geology and palaeobotany. In a letter to Sir Charles Lyell, the palaeobotanist William Carruthers wrote that fossil plants collected from coal at Falkirk [written in the most general of terms] by "Mr Peach" had been crucial in solving a problem of plant relationships on which he had been working (GB 0237 Sir Charles Lyell Gen. 109 Lyell 1/546-547 [NAHSTE]).

Carruthers had become a fellow member of the Royal Physical Society of Edinburgh on Wednesday 24 November 1858 and was no doubt aware of Peach's activity through this avenue of contact.

Some of the West Lothian material displays a typically 'Peachian' solution to the preservation, presentation and ease of study of some of his collection. In the case of original plant cuticles from West Calder, West Lothian, he carefully lifted the plant cuticle from the surface of the rock matrix and preserved it either within two sheets of glass or with a stiff card backing (Figures 7A - F; also Peach 1878a). This technique is unfamiliar to us and we do not yet know whether this involved a strictly physical lift from the surface of the rock or a chemical process, i.e. an early experiment in acid dissolution of matrix. Dr D. M.

Martill has suggested (pers. comm. 2007) that such a chemical process could have involved transfer to a block of wax and then the melting or dissolution of the wax to leave the specimen on glass. Nor do we know how many specimens Peach ruined to achieve each success. We also wonder if this is a unique example, or if other workers also adopted this technique. But, in any case, we see here an early palaeobotanical equivalent of a herbarium sheet, but one containing Carboniferous sphenopsid ferns. The delicate tracery of the plants may have appealed to Peach's aesthetic nature, but it also had its practical value in making the microscopic study of black plant cuticle on an otherwise black rock surface possible as well as preserving the delicate cuticle. At any rate, he used specimens mounted in this way as demonstration specimens, for example of *Sphenopteris affinis* from West Hermand at the Botanical Society of Edinburgh on the 14 May 1874 (Peach 1876b, 1878a). In this case, at least, it may be that he selected this technique partly because of the friability of the original matrix (Peach 1878a, p.133):

'To help to set this to rights, I have taken portions of the plant out of the matrix, and placed them in glass, so that they may be well seen. In addition I send specimens in shale, to show how greatly it varies, and also what a magnificent Fern it must have been. I regret that these are so fragmentary. The "blaes," when exposed, are rendered so friable by wet and sun that they fall to pieces. How many fine and good specimens has it been my lot to see crumble to pieces in my hands when trying to secure them!'

Interestingly, Peach ascribed some of the variation in *Sphenopteris* specimens to the annual cycle, from some "showing a wintry appearance", through spring

specimens in 'circinate veneration', the uncoiling of young leaves as for example in modern ferns, to fructifications in summer and autumn (Peach 1876d).

Peach and the Edinburgh scientific scene

NMS.G.1959.15.368 (a specimen of *Calamites nodosus*) is a typical Peach Collection fossil plant and is labelled as having been collected from "The Cleuch, Falkirk". The fossil is mounted on a rectangle of stiff card with Peach's usual mix of pen and pencil notes and sketches. On the reverse of the card is an invitation to the Annual Social Meeting of the 'John o' Groat Association' on the evening of Wednesday 14 January 1864 (Figure 8). This was a charitable society set up in Edinburgh to provide relief monies for the needy 'back home' in Caithness, rather than what is now (2007) understood by the same name; a club for those who have completed the journey from Land's End to John O' Groat's (the south-western and supposedly northern extremities of the British mainland) by various means! The John O' Groat Association had held its first meeting on 17 January 1863. Prior to 1877, two separate charitable institutions operated toward the same end within Edinburgh, the Edinburgh Caithness Benevolent Association and the John O' Groat Association, which joined forces in 1877. As far as we can determine from our timeline for Charles Peach, this invitation would have been made a full year before he moved house to live in Edinburgh.

Peach, however, had a number of opportunities to attend specifically scientific societies in Edinburgh and seems to have seized on them with avidity. We outline some of those known to us on the geological side, in which we can demonstrate Peach's more or less significant involvement:

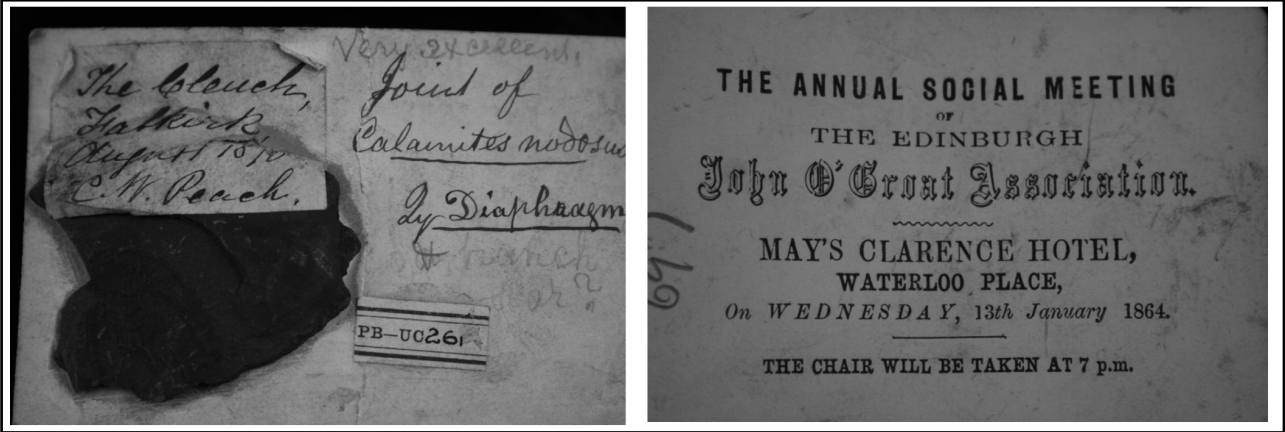


Figure 8. An invitation card to the 1864 'John O' Groat Association' Annual Social Meeting held in Edinburgh. On the back of the card, Peach affixed a fossil of *Calamites nodosus* (NMS.G.1959.15.368) collected from The Cleuch, Falkirk, in August 1876.

Edinburgh Naturalists' Field Club

A report of an outing with the Edinburgh Naturalists' Field Club (Peach 1874a) prompted us to investigate the *Transactions of the Edinburgh Naturalists' Field Club*. This revealed that Charles Peach was listed as an Honorary member of this Club along with four other gentlemen in the 1881 - 1882, 1882 - 1883 and 1883 - 1884 Sessions. The ENFC was first instituted in 1869 for the practical study of Natural History with regular field meetings in the Lothians and Borders for members being held in May, June and July. It was only after the 1879 Annual Meeting that the Council adopted the proposal to hold evening lectures during the winter months. With this switch to evening presentations came the start of published notes of the Club. We therefore cannot determine when Peach joined this club, or the extent of his activities with it, but note that he was aware of the presence of this group of individuals back in 1874, 5 years before the evening programmes began.

Botanical Society of Edinburgh

From its *Proceedings*, as attested in the reference list of the present paper, it is apparent that Charles Peach was a fairly frequent participant in the meetings of this Society, whose archives survive at RBGE. He was never a full Fellow, but was elected an Associate on 13 January 1870. Associates of the BSE are defined as follows in the *Laws and Bye-laws of the BSE, Chapter IV. Admission of Members. Section V. Associates*:

"The Society shall have power to elect by ballot Associates from those who, declining to become Resident or Non-Resident Fellows, may have acquired a claim on the Society by transmitting specimens or Botanical communications."

What "declining" really means is that Associates were usually working men who could not afford the 12s 6d joining fee and the 12s 6d annual membership fee thereafter that were asked of Resident and Non-Resident Fellows (Mr Graham Hardy, RBGE, pers. comm. 2007). This would be entirely consistent with Peach's known low income and his status elsewhere - for instance his Associateship rather than full Fellowship of the Linnean Society of London, attested by the 'A. L. S.' routinely appended to his name in article headers.

Peach's obituarist in the Botanical Society's *Proceedings* (Taylor 1889, p. 12) noted how in the six years after his election in 1870, Peach "laid before us new finds in fossil botany, and created

fresh enthusiasm for its study even among veterans like Professor John Hutton Balfour [1808-1884: professor of botany at Edinburgh: grandson of James Hutton's cousin] and Sir Robert Christison [1797-1882: professor of *materia medica* at Edinburgh but better known for his forensic pathological work in the case of Burke and Hare the serial murderers and body-sellers!]. He received much kindly encouragement from the first of these worthies in making thorough searches in those new localities for fossil plants, then just laid open by industrial enterprise around Edinburgh."

Royal Physical Society of Edinburgh

Peach was also involved in the Royal Physical Society of Edinburgh (RPSE) which provided the most widely used outlet for Peach's various geological writings immediately before and after being based in Edinburgh. This organization is now poorly known, partly because its archives regrettably cannot currently be located, and it is not yet clear how it compared to the Edinburgh Geological Society in terms of its relative attractions to geological and palaeontological folk. It does however seem to have been an important Edinburgh venue for serious natural scientists: effectively a replacement for the long-moribund Wernerian Society which it absorbed in 1858, and without the constraints posed by the selectivity of the Royal Society of Edinburgh. This was apparently so in the 1840s and 1850s (Taylor 2002) and there is no reason to believe that the Society lost any of its status in Peach's years at Edinburgh, when such as Archibald Geikie, Robert Etheridge junior, H. Alleyne Nicholson, and Ramsay Traquair, the Museum's Keeper of Natural History and vertebrate palaeontologist, all served as officers. Indeed, it is to one of these men that we need to turn for an early published history of this Society. Traquair (1903) noted that the Society had begun primarily as a forum for medical discussions, but later changed into a venue for communication of Natural History. During Peach's years in Edinburgh, the Physical held its meetings at 5, St. Andrew Square, Edinburgh. The accompanying publication which ran to three volumes from 1854 - 1866 cost the society dear, particularly in view of the "extremely small annual subscription" (Traquair 1903), and to keep afloat, the Society sold off much of its library of old medical books. Publication of the journal resumed in 1874 under a better financial climate, but interestingly, Traquair gives justification as to why the 'Physical' was able to happily co-exist with the Royal Society of Edinburgh (indeed with many members in common). As he saw it, the Physical covered those aspects of Natural History which the Royal did not to

the same extent, the Royal being primarily concerned with the communication of zoological research. It was (Traquair 1903, p. 109):

"a society to which the older working members may contribute their shorter papers, especially those of local interest, and where the younger men, meeting their elders on terms of common Fellowship, may acquire the art of writing and of demonstrating the results of their early labours."

Peach himself had, even at Wick, been elected a non-resident member in 1850, and was a regular contributor of papers to its meetings, initially *in absentia* but latterly in person, especially after he was elected a full Fellow in 1867 (Anon. 1885). He was evidently well enough regarded, for he served as one of its Presidents from 1869 to 1872. Unfortunately this coincided with the above-mentioned hiatus in the publication of the Society's *Proceedings*. But there is no possibility of confusion with his son Ben who also served as President of the Society, in 1882, for Charles' presidency is recorded in Anon. [1882], while the *Scotsman* newspaper reported that Charles gave his presidential address on "The fossil flora of the Old Red Sandstone of the North of Scotland" on his retiral from the presidency at the meeting of 27 November 1872 (Anon. 1872, also Jack and Etheridge 1877).

Royal Society of Edinburgh

Although Peach was not a Fellow of the Royal Society of Edinburgh, it handsomely acknowledged his work with the award of the Neill Medal for the 1871-74 triennial period "for his contributions to Scottish Zoology and Geology, and for his recent contributions to Fossil Botany" (Geikie 1875, p. 509). Geikie's formal presentation speech on 5th April 1875 provides additional evidence of the high esteem in which Peach was held (pp. 511, 512):

"Within the last few years he has continued his services to fossil botany [*i.e. carrying on from his ORS work in the north*] by bringing to light new and most interesting vegetable forms from the Carboniferous strata of the basin of the Forth. He has shown, for example, the connection between the flower-like *Antholites* and the usually detached fruit, *Cardrocarpon*, and has obtained in one fossil a conjunction of microspores and miospores. ... In every department of natural science to which Mr Peach has given his attention he has distinguished himself as a keen-eyed and enthusiastic collector, with an almost unrivalled

shrewdness in detecting what was new, and at the same time a disinterested readiness to hand over his materials to those who had more specially studied the department of natural history to which those materials belonged. For his varied contributions to science, carried on for so long a time, with a purity of motive and a generous helpfulness towards others which have won for him the esteem of all naturalists, and with an enthusiasm which the lapse of more than threescore years and ten has left undimmed, the Council has adjudged to him the Neill prize. I beg on their part to present him to you, with the cordial wish that he may yet live for many years among us as an honoured type of the true collector and naturalist."

The medal was formally awarded for his recent work on palaeobotany and the vertebrate palaeontology of the Carboniferous rocks of the basin of the Forth. It was normally restricted to Scottish recipients, but the Council appear to have bent the rules, to treat Peach as an honorary Scot and to acknowledge also his work before the strict 5 year period of the prize!

Edinburgh Geological Society

In 1871, Peach became an Associate of the Edinburgh Geological Society (EGS) as recorded in Volume 2 of that body's Transactions (for 1869 - 1874). This was at a time when Sir Roderick Impey Murchison was the first Patron of the Society (1863 - 1871) and was soon to be followed by Sir Charles Lyell (1871 - 1875). On the 1883 Members Roll, Peach is still listed as an Associate and a comment just prior to this explains this membership status:

"Law XVI enacts... The Society shall have the power to elect by ballot as Associates, gentlemen distinguished for their Scientific attainments, and researches, particularly in any department of geology, or who may have claims on the Society by aiding the furtherance of its objects".

Charles Peach participated in the evening lecture series and in the informal display of specimens, and also in the field excursions. His first presentation was on Thursday 16 February 1871 on "Notes on the coalfields at Falkirk", and other contributions followed. Not all became formal written papers in that particular society's published proceedings (though they may well have ended up being published elsewhere); for instance, Volume 3 of the *Transactions*, for the mid and late 1870s, records Peach giving a presentation 'On the Western Highlands of Sutherlandshire' with 'sections and fossils' on 18

March 1875, and 'On some fossil plants from the Carboniferous Sandstone around Edinburgh' on 17 May 1877, as well as one on 20 December 1877 which was formally published as Peach (1880).

A folded newspaper clipping attached to stiff card on which a fossil specimen was mounted (NMS.G.1959.15.132) details a joint excursion between the EGS and the Glasgow Geological Society:

"On the invitation of Mr James Melvin, Bonnington, vice-president of the Edinburgh Geological Society, the fellows of that and of the Glasgow Geological Society made an excursion on Saturday to the Raws and Camps Quarries, between East Calder and Ratho, for the purpose of inspecting the section of the Burdiehouse limestone exposed in the workings there. Over fifty gentlemen responded to the invitation..." (Anon. 1878).

The specimen in question is labelled as collected on the 18 May 1878 and this indeed corresponds with the Saturday mentioned in the newspaper report (Figure 9).

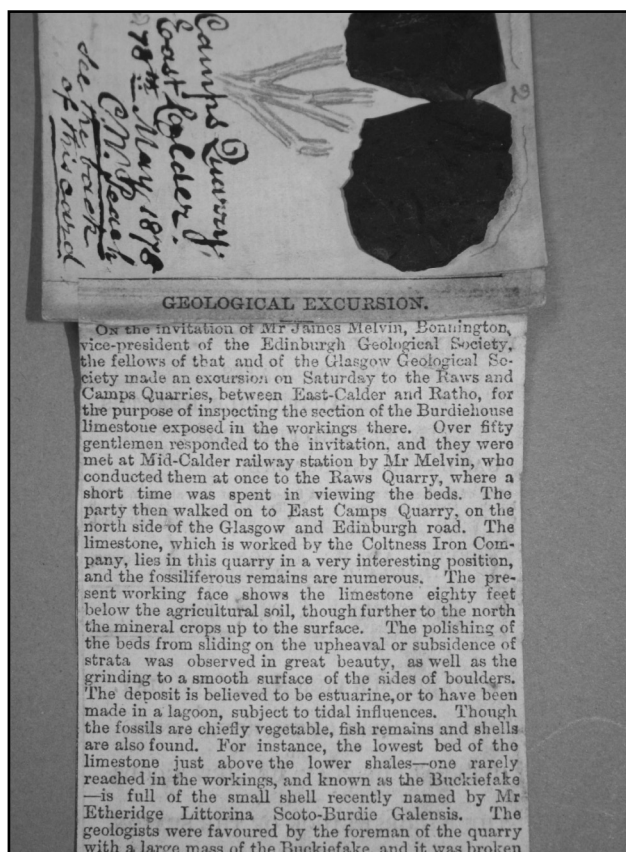


Figure 9. Newspaper clipping reporting a joint field trip of the Edinburgh and Glasgow Geological Societies attached to a specimen that Peach collected on this excursion (NMS.G.1959.15.132; the organ genus *Bowmanites carnbrensis* of the plant *Sphenophyllum*).

The British Association for the Advancement of Science

The BAAS was strictly speaking a national society but we note it here as it was one of Peach's longest-standing venues and its meetings were moreover showpieces for the local savants, and Peach attended several in or near his home ground at this time (Dundee, 1867; Edinburgh, 1871; and Glasgow, 1876), appropriately giving an account of new fossils from around Edinburgh in 1871 (Peach 1872). He himself had been a subscriber since 1847 (*Annual Report* for 1866, list of members) and often attended its meetings, successively distributed around the country, and delivered papers and showed specimens (e.g. Peach 1868, 1869, 1870a, 1872, 1877).

Peach's final years of collecting

We like to think that Peach was obviously both mentally and physically active in the field of geology even in his 78th year, as the dates on the fossils show. Indeed, given Peach's age and the ambiguity of the verb 'to collect', which can mean to collect in the field, or to amass a collection of specimens which may or may not have been found by others, we wondered whether Charles Peach was actually doing his own field collecting. Did others do it for him? For instance, was Ben collecting specimens to take home for his father? This last is unlikely, for Ben's personal collecting was almost certainly strictly controlled by his duties to the Survey which would presumably have call on any specimens he found. But it is unlikely that Peach was relying on anyone else to any great degree. The pattern of collecting dates shows repeated visits to specific localities, at any time of the week, which would only fit someone who had plenty of free time - or, indeed, was retired, like Peach himself. Peach did sometimes comment on specimens collected by others, such as *Ulodendron* and *Halongia* 'by Messrs. Galletly and Lumsden' (Peach 1876c). However, he plainly did most of his own field collecting, as testified by many others, notably his *Nature* obituarist as already quoted above, as well as Peach himself (for collecting up to at least 1876, Peach 1873b; 1878a; 1879). In another obituary, the author commented that he had known Charles Peach for over 20 years, and reflected (Taylor 1887, p. 327):

'... many a time ... while accompanying him along crag or sea-coast, we wondered whether the lithe old man shone most as an example of the successful pursuit of knowledge under difficulties, or as a walking testimony that out-of-door natural history studies conducted to a happy old age.'

Smiles, writing probably of April 1878 (1878, p. 393), reported that Peach 'says he is not "an old man". He is still an "old boy". That is what his wife calls him. For he is cheerful, communicative, bright and lively as ever', while the RSE resume of 1882 stated that Peach "still continues to work at his favourite hobby" (Anon. [1882]). However, Peach clearly did suffer a slow decline in his health: "[h]is health has for some time past been failing", noted the *Nature* obituarist (Anon. 1886, p. 447); in the years before his death, Peach's 'natural powers gradually abated, and for over three years he had not gladdened our evening meetings [of the EGS]' (Taylor 1887, p. 327), and indeed Peach's death certificate gave 'age & debility' as the cause. One would expect Peach to have given up fieldwork some while before, if he was doing the bulk of field collecting of the specimens in his collection, and indeed the fossils' dates of collection tail off after about 1876, with a few in 1878 and only odd ones thereafter. This ties in well with Taylor's (1889) estimate of the period of Peach's palaeobotanical work as 1870-6 or thereabouts.

The later curation of the Peach Collection

Perhaps the first step in the systematic classification of the palaeobotanical collections of the then Edinburgh Museum of Science and Art was undertaken in 1882 by Mr. Robert W. Kidston (1852 - 1924) who was temporarily appointed to revise, re-label, and re-arrange the fossil plants, and completed his work during 1883 (Traquair [1883, 1884]). Kidston had attended Botany classes taught by Sir John Hutton Balfour at the University of Edinburgh in 1878 (Liston and Sanders, 2005), and would, later in his career, undertake the description and figuring of the permineralised plants from the Early Devonian Rhynie Chert with A. G. Lang (Trewin 2004). Two years previously, in 1880, Charles Peach's son, Ben Peach, had successfully approached Kidston with regard to Kidston taking an honorary position at the Geological Survey branch based in Edinburgh to deal with their collection of Palaeozoic plants (Liston and Sanders 2005; this collection was, however, confusingly also housed at EMSA!). Kidston's work in Edinburgh made him much sought after, and in 1883, the British Museum (Natural History) contracted him to revise and catalogue their Palaeozoic plants (Liston and Sanders 2005).

A later campaign of curation of the palaeobotanical collections took place in the late 1920s and early 1930s, ending with the compilation of a catalogue in 1935 (Rowatt 1936). It is not yet clear whether it

was then, or in Kidston's time, that the system was instituted of labelling the palaeobotanical collections with small rectangular paper labels with printed black ink lettering following a specific format, for instance: "PB-LC XXX", where the first element refers to palaeobotany, the second element the stratigraphical level of occurrence (in this case Lower Carboniferous), and the third element the specimen number (an example can be seen in Figure 8A: PB-UC 261 [Palaeobotany-Upper Carboniferous Specimen 261]). There exists an accompanying handwritten scroll register listing these entries and to it was added in 1959 these museum objects in the general classification scheme of the Geology Department (Lot NMS.G.1959.15). However, the system was never completed.

In 1999, the microscope bought in 1844 and used by Charles Peach was offered for sale to the National Museums of Scotland as it was then (Nuttall 2004). This microscope (NMS.T.1999.40) was accompanied by an illustrated notebook and a few prepared microscope slides. However, during the course of our audit work on the pre-existing NMS collections, further, and unregistered, thin sections bearing Peach's characteristic handwritten labelling came to light. These had apparently found their way into the collections via a different route to that of the microscope purchased in 1999. This portion of the Peach collection is registered as NMS.G.2007.28.

Conclusions

This contribution marks a preliminary study of a remarkable man who in later life became one of Edinburgh's local geological heroes, even if this work is perhaps a little forgotten today by comparison to his major discoveries in Cornish and Caithnessian exile. The pattern of pioneering discovery of new fossiliferous localities which marked Peach's earlier career continued after his retirement and move to Edinburgh in 1865. Peach's workman-like attitude to natural history is still in evidence later in his career with the hand-made production of microscope slides, his illuminating and effusive comments written on accompanying specimen labels, and his participation in the science that he loved into old age. His detailed labelling has also enabled us to tie in his collecting work with what is known of his life to a surprising degree, even in a preliminary survey. Moreover, the question of the significance of Charles Peach's collecting raises some surprisingly complex issues, and it is to those that we now turn.

Peach poses obvious problems to the historian because of the breadth of his interests across disciplines - palaeontology, marine biology, botany and perhaps even prehistory - and geographically across Britain. It is probably highly significant that, at various times in his early service, he was stationed at Norfolk, where he was said to have found important fossils of elephants from what was presumably the Cromer Forest Bed Formation (Anon. [1882]); at Lyme Regis and Charmouth (if briefly), where he was said to have encountered the local fossils at a time when they were at the height of their impact on British palaeontology, with a commensurate impact on him (1830-1, Anon. [1882]); at Beer not far away, and Torquay and Paignton also in Devon - another classic area for British geology; in Cornwall; in Aberdeenshire; and in Caithness. And each station was only a base for his official duties, so he had much opportunity to roam. In so doing, he could get his eye in on a wide variety of fossils in various states of preservation - something which Hugh Miller travelled to England explicitly to do (Knell and Taylor 2007). Very probably this wide experience was a factor in Peach's making crucial finds in unpromising rocks in Cornwall, and again in north-western Scotland. He also made a wide variety of contacts, some at first sight surprising, such as Alfred, Lord Tennyson. But this is perhaps to be expected, given the potential to meet geologists and natural historians not only on fieldwork - like Murchison in the North - but simply on holiday (often the same thing) or even at their family homes, away from the formality and crowd of the cities. And by attending British Association meetings, as well as the everyday exchange of specimens and information, he would have reinforced and extended his network.

But the problems posed by Peach's range are, strictly speaking, practical rather than fundamental (for all that they mean more work). A rather more intractable problem is how to put him in full context, given the relatively recent development of historical studies of collecting, and especially of the process of collecting (see, for instance, Knell 2000, Torrens 2006, Kohler 2007, and Taylor 2007). One could well argue that Peach expands the known diversity of collectors and their aims. Finds in the field are vital to any science, such as palaeontology, based on such collecting. But from the historian's point of view, Knell (2007b) has commented that collections of fossils are not always of much help, at least in themselves; the historian almost always relies on what the collector has written, such as labels, notes, and letters. Of course, this depends on the collection and the questions being asked by the historian: as Kohler

(2007) notes, the history of collecting has often been more concerned with questions about collections - for instance, with the cultural meanings of objects - rather than the practices of gathering those collections. But that dichotomy of result versus process is also a practical problem. By its very nature a substantial collection telescopes years, and often decades, of collecting activity to give the physical results which one sees today. For instance, Hugh Miller's fossils are not usually individually labelled with their date of collection. Thus it is often not clear whether a particular fossil from, say, near Edinburgh was collected in the 1820s, when Miller was a stonemason, or the 1830s, when he was a trainee banker, or in the 1840s and 1850s in his spare time from being an editor. This is a shame, because the early development of Hugh Miller's geological activity is not well understood (Knell and Taylor 2006, Taylor 2007). By contrast, Peach's dated collection sets itself out along the dimension of time with all the informational content that that implies. For instance, one can trace his changing activities with time, as we have done here. But more could be done, such as dating the accessibility of particular fossil localities. This added temporal dimension enables, and indeed forces us, to ask questions about the process of collecting which would not have otherwise been encouraged by a look at the finished collection. But even using the word 'collection' begs an important question, for there is not, and even more to the point there never has been, any one finished and unitary Peach Collection in the sense that one can speak (more or less) of the Hugh Miller Collection.

Another major problem is the tendency of many historians to rely solely on written publications when assessing a worker's significance. This will often lead to bias: a classic example is Mary Anning junior of Lyme Regis, whose actual impact was wildly disproportionate to her nonexistent list of publications (Torrens 1995, Taylor and Torrens 1987). We suspect that such a bias is also true of Peach, who famously made fossil finds which were critically important to resolving debates in Palaeozoic stratigraphy in south-west England, and again in the North-west Highlands). Indeed, one might well come to suspect, even expect - as we do - that Peach's collecting, at any rate after the early years, was far from random (at least within his home range of the time) and was targeted, not merely at rich sites, but at specific scientific questions. Plainly Peach always had the priceless - and often forgotten - advantage of the self-supporting 'amateur': that he could work on what interested him rather than what interested his paymasters (Torrens 2006). He was not primarily a com-

mercial collector such as, say, Mary Anning, who always had to bear in mind the needs of the market for décor fossils alongside the more scientifically interesting finds. Peach's collecting could be aimed at more purely scientific questions (except, of course, insofar as he might have had future sales to the Survey in mind). In this respect, as well as in the level of documentation and (to some extent) the sites selected, Peach's collecting might seem more comparable to that of the fossil collectors of the Geological Survey (Knell 2000, 2007a). However, the analogy breaks down in detail: those Survey fossil collectors tended to be lowly mechanics rather than specialist interpreters in the field, collecting *en masse* as instructed by the surveyors. By contrast, Peach always had the freedom to do what he wanted and to think for himself. For instance, as well as collecting to answer questions he thought were important, or just to enjoy himself, he could, and certainly did, look at fossils in the sense that they were the remains of living things in their own right, rather than the other sense - which Survey work emphasised - that they were labels for strata. It would be an interesting project to analyse how far Peach's collecting work was aimed at resolving the questions of the time - and indeed how far it generated those very questions. To our minds, this seems essential to develop a full modern assessment of the role which Peach - and his fossils - played, for example, in studies of early plants; in the mid-19th century revision of the internal stratigraphy of the Old Red Sandstone which swapped the Lower for the Middle Old Red (cf. the posthumous revisions of Hugh Miller's *The Old Red Sandstone*); and in the palaeobotany of the 1870s (until Peach's activity was seemingly cut short by increasing age).

One might well wonder also how far Peach's collecting was influenced by the changing role and function of museums, given his close association with a number of museums, both as a collector and as an occasional curator, and his personal links (as a father, and as a fellow member of local learned societies) with those who worked in, and with, the Edinburgh museums (if one bears in mind that the Geological Survey in Scotland had a museum-within-a-museum in the EMSA).

We also note that Peach interacted with his contemporaries beyond his written papers. He may, as his Botanical Society of Edinburgh obituarist commented (Taylor 1889, p. 12), have considered "brevity ... a chief merit in a scientific communication [Taylor obviously meant the written variety]", and his published papers are indeed short and astonishingly chat-

ty in tone even perhaps by the standards of the time (for instance, see Peach 1878a). But Taylor at once went on to say of Peach's Botanical Society talks that "his brief notices gave no idea of the interest excited by the large sepia drawings, as well as the neat way in which the fossils, [were] often mounted in glass cases so as to show both sides of the stem, and having the special characteristics of each specimen carefully indicated by arrows drawn on paper which was gummed to the stone. From our limited audiences several young workers were thus incited to enter this little-trod field of science." And the impression of a memorable speaker is confirmed by Taylor (1887, p. 329), this time as the Edinburgh Geological Society's obituarist, commenting that when the advance of palaeontological discovery 'treaded on his own toes, [Peach] was among the first to accept the inevitable, only beginning some new research with the old boyish enthusiasm. Thus, his discoveries in its fossil botany helped most powerfully in the recognition of the Old Red Sandstone as a lacustrine deposit. Three lecture cartoons, made at Wick, announced this in graphic fashion, to a popular audience. In the first, the old man of the sea [evidently Peach, who called himself by this name at times: Taylor, p. 327] is sailing in an ancient boat with weird crew over an universal ocean; in the second, he approaches a shallow sea-shore studded with giant fuci; while in the third, he sails into a narrowing bay, the shores of which are adorned with conifers and other trees." To extend his own metaphor, Peach was navigating his own boat, and it is plainly unsafe to assume that he was a passive collector of raw data for the metropolitan elite.

A publication-based study would also miss the distinctive ways in which fossil collections are used. One obvious issue is access for formal research. Today there is a strong, though admittedly not complete, prohibition against publishing formal research based on private collections. In those circumstances any discussion of scientific research can pretty much ignore private collections in favour of public ones, and to treat all collections as common public goods, as Kohler (2007) does. But we think that this is an oversimplification, and that it would be anachronistic to project this attitude back into the mid-19th century, where the dichotomy breaks down. For one thing, many collections which we would think of as 'public', and are now indeed today freely accessible, were effectively private, in the sense that access was only gained by payment of a fee, or by permission of a member or someone in authority, or even both (e.g. the Natural History Museum of the University of Edinburgh, Waterston 1997, pp. 81-2; the Bristol Institution, Taylor 1994). Conversely, there was, as

far as we know, no modern prohibition against publishing specimens in a private collection, and some private collections were effectively open to the public in much the modern sense. Obviously, published specimens become, to some extent, public data by virtue of being published. But the private versus public distinction still mattered, we think. One might well contrast, say, Hugh Miller to Peach. There is no doubt that eminent and not-so-eminent geologists visited Miller's private collection and examined the fossils there (Taylor 2007). But this did not only involve a trip to the outskirts of Edinburgh. It was a visit to a private collection, and this - especially to the Victorians - would always have had the overtones of a social occasion - even if Miller had a horror of social formalities, to be sure, and his museum was in the garden, detached from the house with all its overtones of Victorian domesticity and conduct (Campbell and Holder 2005). There would in any case be the unspoken implication that the collection was always first reserved to the owner's own aims and researches, even if those were put off for a later day, such as during retirement; Miller himself was a busy newspaper editor. But even then these plans might go by the board thanks to an unexpectedly early demise, as in Miller's own case. Public museums were quite different, with the free access they offered to a fully public collection in a convenient central location.

Another factor in public usage is the speed with which the collection becomes available. It seems to us that Peach's collections passed relatively rapidly from the private domain of the collector's cabinet into the public domain of the museum. Peach's fossils might not have moved as immediately as those of a commercial collector, but at least their relative speed of transition to the public domain ensured that Peach's fossils lost little if any of their freshness, which was particularly important if Peach's collecting activity was directed to topical issues. That is not to say that Miller would have been behaving unreasonably by sitting on his collection (which, in any case, he abundantly published in his own very special way). Rather, Peach's way of dealing with his collection, whether or not it was forced by his family finances, increased its scientific usage while still allowing Peach to think of himself as having a collection of his own, rather than being a mere agent for others - a subordinate role which was, in any case, refuted also by his extensive preparation and study of his finds. It will be interesting to know whether those suppositions are confirmed by more detailed study.

One might also reflect upon the practical problems of studying a collection such as Peach's. Even examining the specimens in one museum is a daunting task when they are physically merged into enormous general collections, often across organizational boundaries. And when the collection is only partly curated, it becomes harder to spot its full size and significance, as here. This is unavoidable under the stratigraphical and taxonomic combination under which any collection has to be arranged to be useful for most purposes, and is further compounded by the common curatorial lapses. For instance, the 1887 accession was never completely registered and many, at least, of the plants escaped numbering even under the Kidston system. Many of Peach's fossils therefore became part of the inherited backlog of labelled but unregistered specimens. This lack of full paper documentation meant that they could not be observed even by running one's eye down a register entry. They thus entered a limbo whereby the Peach collection as a whole could only be perceived by long-serving curators with elephantine memories, even if those researchers wanting to see specific taxa were fully satisfied. In this particular instance, an audit, initiated for the primary reasons of a collections move and the necessary tracking of specimens, has been the means of recognising a relatively unknown collection by Charles Peach and perceiving its integrity across the many taxonomic divisions into which it is now split and merged with other collections.

The ability to create such a virtual reconstruction of a now scattered collection is, of course, one key reason for a full computer catalogue. But, as this project shows, it is possible to use such simple audit work to produce useful results immediately. A listing for audit purposes will usually be a pretty barebones effort, if only for reasons of workload (for instance, to avoid the time taken in updating and standardizing stratigraphical terminology), and in the limit it only really needs enough information to identify each specimen unambiguously. But the museum number, and, as in Peach's case, the date placed on the specimen by the original collector, both contribute to that identifiability and should be recorded as two of the earliest pieces of data. In fact, even without the immediate trigger of some event such as a collections move, there is something to be said for a simple audit list to find out just what survives in a collection and where, and to spot obvious errors, anomalies and patterns (by sorting in various ways), before going on to compare this with the registers and other information and generating the full catalogue (for which, in any case, the audit list often serves as an initial skeleton).

Moreover, such a systematic and synoptic survey will familiarise the curator with the range of labelling and flag up issues and queries for further investigation - as indeed has happened here.

This study can only be a preliminary look. Specialist work would be needed in individual areas, for instance of Old Red Sandstone plants and vertebrates, and 1870s palaeobotany, to assess Peach's contributions. And more work has yet to be done on the collections themselves, at least in NMS where - quite apart from the palaeobotany collections, where our work implies there may be unknown figured and cited specimens - there are further Peach specimens in the vertebrate and invertebrate collections. Their omission here reflects, not a bureaucratic division, but simply the practical progress of the audit to date (and the scope of this paper), as well as the probable relative dominance of plants in the Carboniferous rocks which Peach worked during the period in question. Nor should we forget the Peach specimens in other museums and the British Geological Survey.

In the long run we (LIA and MAT) had intended to prepare a full online catalogue of the Peach Collection in NMS, with an introduction and discussion (for which the present paper is essentially a preliminary study). Such a catalogue is, at least for the moment, now in question with LIA's departure to other pastures. But it is clear to us that Charles Peach and his fossils are worthy of further study. And already we have gained an insight, and, we hope, encouraged a fresh look at one of the great local heroes of 19th century geology, the "genial and enthusiastic naturalist" (Anon. 1886, p. 446) who followed his own exhortation (Peach 1880, p. 149):

"It would be well if all lovers of Old Red fossils were to make known their discoveries and place them where they might be got at ... The best of mine are in Jermyn Street Geological, and British Museums, and portions also in the Museum of Science and Art in Edinburgh; and thus, I trust, safely preserved for future use."

Acknowledgements

We thank Dr Yves Candela, Dr Sarah Stewart and Mr Simon Howard (NMS) who provided great assistance in the audit work which brought this material to light, and Ms Pam Babes for discussion of documentation systems. We thank Dr Sara Stevenson (Scottish National Portrait Gallery) for assistance with reproduction of SNPG PGP HA 1761 (a Hill and Adamson calotype of Charles Peach in his coast-

guard uniform). Dr Alison Morrison-Low (NMS) generously provided us with access to a file of research papers relating to Charles Peach which she and Dr Bob Nuttall had assembled in relation to the study of Peach's microscope, Dr Jason Hilton (University of Birmingham and our former colleague) assisted with information on the Craigleith trees. Professor Simon Knell (University of Leicester) discussed issues concerning collecting practice, and Mr Geoff Swinney (NMS) drew our attention to other references. Mrs Christine Thompson (NMS volunteer) helpfully provided us with information on Ben Peach. Dr Suzanne Miller (formerly Keeper of Natural Sciences) encouraged and supported our research into this area of NMS collections. Mr Graham Hardy (RBGE), initially Ms Tracey Shanks and subsequently Ms Sheila Mackenzie (both NLS) provided archival information from archives in their care. Mrs Vicki Hammond (Royal Society of Edinburgh Journals & Archive Officer) provided us with information on the Neill Medal and the RSE's Council Minute Books. The excerpts used in this work are quoted by permission of the Royal Society of Edinburgh (RSE) from the RSE's Council Minute Books, January 1877 to December 1884, held on deposit at the National Library of Scotland (NLS Acc.10000/22). We also thank the librarians of NMS for their support. We thank the Syndics of Cambridge University Library for the permission to quote an excerpt of CUL DAR 174. Drs Peter Friend, David Norman and Prof. James Secord (all University of Cambridge) provided encouragement and helpful discussion of previous drafts of the manuscript. Dr David Martill (University of Portsmouth) suggested a method by which plant cuticles could be transferred to glass via wax. Figures 4 to 9 are courtesy and copyright the Trustees of the National Museums of Scotland. Mr Stan Waight provided useful information on British Coastguards such as Charles W. Peach through his website (<http://www.genuki.org.uk/big/Coastguards/index.html>) and email exchanges. LIA acknowledges funding from the Isaac Newton Trust (University of Cambridge).

References

Publication dates in square parentheses [...] refer to inferred, rather than positively known, dates of publication.

Some of the society *Proceedings* and *Transactions* in which Peach published were characteristically published every few years, leading to a variable but potentially substantial time lag, amounting sometimes to 3 or 4 years since the actual delivery of the

original spoken paper. We have not found it necessary to deal with this issue in detail here, especially as the written form of the paper might have been revised after delivery and before publication, but it should be borne in mind during further study.

The bibliography of the annual reports of the Edinburgh Museum of Science and Art is, mercifully, explained by Swinney (2002).

The website: <http://www.searchforancestors.com/utility/dayofweek.html> was of great use in determining which days of the week Charles Peach had been out fossil-collecting.

- ALLAN, D.A. [1951]. *Report for the year 1950 on the Royal Scottish Museum*. Scottish Education Department, Edinburgh.
- ALLEN, D.E. 1994. *The naturalist in Britain. A social history*, revised edition, Princeton, New Jersey.
- ALLMAN, G.J. [1867]. 2. Report of the Edinburgh Museum of Natural History, for the year 1866. Pp. 260-263 in Archer, T. C. *Report on the condition of the Edinburgh Museum of Science and Art for 1866*, published as pp. 253-263 in *Fourteenth Report of Science and Art Department, Appendix F*, and as an extract therefrom, and also as pp. 285-295 in *Parliamentary Papers* (1867) **XXIII** [3853.].
- ANDERSON, J. 1865. Notes on some further remains from Keiss, near Wick. *Journal of the Anthropological Society of London*, **3**, 160-162.
- ANDERSON, L.I. 2005. Hugh Miller: introducing palaeobotany to a wider audience. In Bowden, A. J. Burek, C. V. and Wilding, R. (eds). *History of Palaeobotany: Selected Essays*. *Geological Society, London, Special Publications* **241**, 63-90.
- ANON. 1872. Royal Physical Society. *The Scotsman*, Thursday 28 November 1872, p. 4.
- ANON. 1874. Notice of botanical excursions in 1873. *Transactions and Proceedings of the Botanical Society of Edinburgh* **12**, 54.
- ANON. 1878. Geological excursion. *The Scotsman*, Monday 20 May 1878, p. 4.
- ANON. [1882]. [Untitled MS account of the life and work of Charles Peach, apparently as part of an application for financial assistance.] National Library of Scotland MS Ac 10073/6 [see text for dating and provenance].
- ANON. 1885. List of Fellows. *Proceedings of the Royal Physical Society of Edinburgh* **8**, 517-524.
- ANON. 1886. Charles William Peach. *Nature* **33**, 446-447.
- BUTT, J. 2004. Young, James (1811-1883). *Oxford Dictionary of National Biography*, Oxford University Press, Oxford [http://www.oxforddnb.com/view/article/30266, downloaded 27 December 2007].
- CAMPBELL, I. and HOLDER, J. 2005. Hugh Miller's last house and museum: the enigma of Shrub Mount, Portobello. *Architectural Heritage* **16**, 51-71.
- CHAMBERS, R. 1844. The scientific meeting at York. *Chambers's Edinburgh Journal, new series* **47**, 321-324 (23 November 1844).
- CHRISTISON, R. 1874. Notice of fossil trees recently discovered in Craigleith Quarry, near Edinburgh. *Transactions of the Royal Society of Edinburgh* **27**, 203-221.
- CLEEVELY, R.J. 1983. *World Palaeontological Collections*. 365pp. British Museum (Natural History), London.
- CROWTHER, P.R. 2003. The Charles W. Peach (1800-1886) collection of Cornish fossils. *The Geological Curator* **7** (9), 323-328.
- DAVEY, F. H. 1911. Charles William Peach, A. L. S. *Transactions of the Royal Cornwall Polytechnic Society* **1** (3), 469-499.
- DAVIDSON, R.G. and NEWMAN, M.J. 2003. James Powrie, chronicler of the Scottish Lower Devonian. *Proceedings of the Geologists' Association* **114**, 243-246.
- DAWSON, J.W. 1871. On new tree ferns and other fossils from the Devonian. *Quarterly Journal of the Geological Society* **27**, 269-275.
- DEAN, D.R. 2004. Mantell, Gideon Algernon (1790-1852). *Oxford Dictionary of National Biography* **36**, 559-560 [online version was used, http://www.oxforddnb.com/view/article/18004, downloaded 5 November 2007].
- EDWARDS, W.N. 1932. The fossil tree trunk in the grounds of the British Museum (Natural History). *Natural History Magazine* [London] **3**(21), 164-167.
- FLETT, J.S. 1937. *The first hundred years of the Geological Survey of Great Britain*. His Majesty's Stationery Office, London.
- FREEMAN, M. 2001. Tracks to a new world: railway excavation and the extension of geological knowledge in mid-nineteenth century Britain. *British Journal for the History of Science* **34**, 51-65.
- GEIKIE, [A.] 1875. [Award of Neill Prize to C. W. Peach.] *Proceedings of the Royal Society of Edinburgh* **8**, 509-512.
- GORDON, W. T. 1909. On the nature and occurrence of the plant-bearing rocks at Pettycur, Fife. *Transactions of the Edinburgh Geological Society* **9**, 355-360.

- HERBERT, S. 2005. *Charles Darwin, geologist*. Cornell University Press, Ithaca, New York.
- HIBBERT, S. 1836. On the fresh-water limestone in the neighbourhood of Edinburgh, belonging to the Carboniferous group of rocks. With supplementary notes on other fresh-water limestones. *Transactions of the Royal Society of Edinburgh* **13**, 169-282.
- JACK, R.L. and ETHERIDGE, R. Jnr. 1877. On the discovery of plants in the Lower Old Red Sandstone of the neighbourhood of Callander. *Quarterly Journal of the Geological Society of London* **33**, 213-222.
- JARVIS, A. 1997. *Samuel Smiles and the construction of Victorian values*. Sutton, Stroud.
- KNELL, S.J. 2000. *The culture of English geology, 1815-1851. A science revealed through its collecting*. Ashgate, Aldershot.
- KNELL, S.J. 2007a. The sustainability of geological mapmaking: the case of the Geological Survey of Great Britain. *Earth Sciences History* **26**, 13-29.
- KNELL, S.J. 2007b. Museums, reality and the material world, pp. 1-28 in Knell, S.J. (ed.) *Museums in the Material World*, Routledge, London.
- KNELL, S.J. and TAYLOR, M.A. 2006. Hugh Miller: fossils, landscape and literary geology. *Proceedings of the Geologists' Association* **117**, 85-98.
- KOHLER, R.E. 2007. Finders, keepers: collecting sciences and collecting practice. *History of Science* **45**, 428-454.
- LISTON, J.J. and SANDERS, H.L. 2005. The 'other' Glasgow Boys: the rise and fall of a school of palaeobotany. In Bowden, A. J. Burek, C. V. and Wilding, R. (eds). *History of Palaeobotany: Selected Essays*. Geological Society, London, *Special Publications* **241**, 197-227.
- LOFTUS, G.W.F. and GREENSMITH, J.T. 1988. The lacustrine Burdiehouse Limestone Formation - a key to the deposition of the Dinantian Oil Shales of Scotland. *Geological Society, London. Special Publications* **40**, 219-234.
- LONG, A. G. 1979. Observations on the Lower Carboniferous genus *Pitus* Witham. *Transactions of the Royal Society of Edinburgh* **70**, 111-127.
- McMILLAN, A.A., GILLANDERS, R.J. and FAIRHURST, J.A. 1999. *Building Stones of Edinburgh*. 2nd edition. Edinburgh Geological Society, Edinburgh.
- MARSHALL, P. 2001. *Burntisland. Fife's railway port*. Oakwood Press, Usk.
- MORRISON-LOW, A.D. 1992. William Nicol, FRSE c. 1771-1851 lecturer, scientist and collector. *Book of the Old Edinburgh Club New Series* **2**, 123-131.
- MURCHISON, R.I. 1859. On the succession of the older rocks in the northernmost counties of Scotland; with some observations on the Orkney and Shetland islands. *Quarterly Journal of the Geological Society of London* **15**, 353-421.
- MURCHISON, R.I. 1867. *Siluria. (4th Ed). A History of the Oldest Rocks in the British Isles and Other Countries; With sketches of the Origin and Distribution of Native Gold, the General Succession of Geological Formations, and Changes in the Earth's Surface*. John Murray: London, pp. 1-566, pl. 1-41.
- NUTTALL, R. 2004. 'An Outdoor Man': Charles Peach and the Luminosity of the Sea. *Quekett Journal of Microscopy* **39**, 783-791.
- OLDROYD, D.R. 1990. *The Highlands Controversy: constructing geological knowledge through fieldwork in nineteenth-century Britain*. University of Chicago Press.
- OLDROYD, D. R. 1999. Non-written sources in the study of the history of geology: pros and cons, in the light of the views of Collingwood and Foucault. *Annals of Science* **56**, 395-415.
- OLDROYD, D.R. 2004a. Peach, Benjamin Neeve (1842-1926). *Oxford Dictionary of National Biography*, 43, 232-233 [online version was used, <http://www.oxforddnb.com/view/article/37839>, accessed 25 Oct 2007].
- OLDROYD, D.R. 2004b. Peach, Charles William (1800-1886), *Oxford Dictionary of National Biography*, 43, 233 [online version was used, <http://www.oxforddnb.com/view/article/21665>, accessed 25 Oct 2007].
- PEACH, B.N. 1883. On some fossil myriapods from the Lower Old Red Sandstone of Forfarshire. *Proceedings of the Royal Physical Society of Edinburgh* **7**, 177-188.
- PEACH, C.W. 1858a. On the discovery of calcareous zoophytes in the boulder clay of Caithness. *Proceedings of the Royal Physical Society of Edinburgh* **1**, 18.
- PEACH, C.W. 1858b. On the discovery of beekite and oolitic quartz at Durness, Sutherland. *Proceedings of the Royal Physical Society of Edinburgh* **1**, 429-435.
- PEACH, C.W. 1859. On the discovery of nullipores (calcareous plants) and sponges in the boulder clay of Caithness. *Proceedings of the Royal Physical Society of Edinburgh* **2**, 98-101.
- PEACH, C.W. 1860a. On the chalk flints of the Island of Stroma and vicinity of John o' Groat's in the County of Caithness. *Proceedings of the Royal Physical Society of Edinburgh* **2**, 159-161.
- PEACH, C.W. 1860b. On the occurrence of the Argentine Anchovy, and other fishes, on the coast

- of Caithness; with a note on the termination of the Vertebral column in the tail of the Salmon tribe. *Proceedings of the Royal Physical Society of Edinburgh* **2**, 256-259.
- PEACH, C.W. 1863a. On the fossils of the boulder clay of Caithness. *Proceedings of the Royal Physical Society of Edinburgh* **3**, 38-42.
- PEACH, C.W. 1863b. Further observations on the Boulder Clay of Caithness with an additional list of fossils. *Proceedings of the Royal Physical Society of Edinburgh* **3**, 396-403.
- PEACH, C.W. 1868. On fossil fishes of the Old Red Sandstone of Caithness and Sutherland, with notices of some new to those counties. *Annual Report of the British Association for the Advancement of Science, Transactions of the Sections*, **for 1867**, 72.
- PEACH, C.W. 1869. On the fossil fishes of Cornwall. *Annual Report of the British Association for the Advancement of Science, Transactions of the Sections*, **for 1868**, 76-77.
- PEACH, C.W. 1870a. Notice of the discovery of organic remains in the rocks between the Nare Head and Porthalla Cove, Cornwall. *Annual Report of the British Association for the Advancement of Science, Transactions of the Sections*, **for 1869**, 99.
- PEACH, C.W. 1870b. On some striped stones from Hayle, near Penzance, Cornwall. *Transactions and Proceedings of the Botanical Society of Edinburgh* **10**, 446-447.
- PEACH, C.W. 1872. Additions to the list of fossils and localities of the Carboniferous formation in and around Edinburgh. *Annual Report of the British Association for the Advancement of Science, Transactions of the Sections*, **for 1871**, 109.
- PEACH, C.W. 1873a. On *Antholites pitcairnae* and its fruit (*Cardiocarpum*), with other fossil plants from Falkirk. *Transactions and Proceedings of the Botanical Society of Edinburgh* **11**, 108-109.
- PEACH, C.W. 1873b. On fossil plants from the coal-fields of Slamannan, Falkirk, Dee-side, Tillicoultry, &c. *Transactions and Proceedings of the Botanical Society of Edinburgh* **11**, 342-343.
- PEACH, C.W. 1873c. On a cone of *Flemingites gracilis* attached to its stem. *Transactions and Proceedings of the Botanical Society of Edinburgh* **11**, 356-357.
- PEACH, C.W. 1873d. Note on the structure of fossil stems (*Araucarioxylon*) from Redhall and Craigleith Quarries. *Transactions and Proceedings of the Botanical Society of Edinburgh* **11**, 541-542.
- PEACH, C.W. 1874a. On the discovery of *Spirorbis carbonarius* in the limestone of Burdiehouse, and of an *Estheria* in Camstone Quarry, Arthur's Seat. *Transactions of the Edinburgh Geological Society* **2**, 82-83.
- PEACH, C.W. 1874b. Notice accompanying specimen of *Holoptychius nobilissimus* from the Black Hill, near Melrose, presented to the Society. *Transactions of the Edinburgh Geological Society* **2**, 400.
- PEACH, C.W. 1876a. Notice of a new lepidodendroid fossil from Devonside, Tillicoultry, with remarks on other fossil plants. *Transactions and Proceedings of the Botanical Society of Edinburgh* **12**, 99-101.
- PEACH, C.W. 1876b. Notes on some fossil plants from the shales of West Calder. *Transactions and Proceedings of the Botanical Society of Edinburgh* **12**, 162 only.
- PEACH, C.W. 1876c. Remarks on specimens of *Ulodendron* and *Halonina*, collected by Messrs. GALLETLY and LUMSDEN, near West Calder. *Transactions and Proceedings of the Botanical Society of Edinburgh* **12**, 174-175.
- PEACH, C.W. 1876d. Remarks on specimens of some fossil plants. *Transactions and Proceedings of the Botanical Society of Edinburgh* **12**, 187.
- PEACH, C.W. 1877. On circinnate veneration of *Sphenopteris affinis* from the earliest stage to completion; and on the discovery of *Staphylopteris*, a genus new to British rocks. *Annual Report of the British Association for the Advancement of Science, Transactions of the Sections*, **for 1876**, 144-145.
- PEACH, C.W. 1878a. On the circinate veneration, fructification, and varieties of *Sphenopteris affinis*, and on *Staphylopteris* (?) *Peachii* of Etheridge and Balfour, a genus of plants new to British rocks. *Quarterly Journal of the Geological Society* **34**, 131-136.
- PEACH, C.W. 1878b. Remarks on (with a list) some of the organic remains of Cornwall, in the museum of the Royal Geological Society of Cornwall. *Transactions of the Royal Geological Society of Cornwall* **9**, 47-54.
- PEACH, C.W. 1879. On fossil plants from the Calciferous Sandstone around Edinburgh. *Transactions and Proceedings of the Botanical Society of Edinburgh* **13**, 46-48.
- PEACH, C.W. 1880. Notes on the fossil plants found in the Old Red Sandstone of Shetland, Orkney, Caithness, Sutherland, and Forfarshire. *Transactions of the Edinburgh Geological Society* **3**, 148-152.
- REX, G.M. and SCOTT, A.C. 1987. The sedimentology, palaeoecology and preservation of the Lower Carboniferous plant deposits at Pettycur, Fife, Scotland. *Geological Magazine* **124**, 43-66.

- ROLFE, W.D.I., DURANT, G.P., BAIRD, W.J., CHAPLIN, C., PATON, R.L. and REEKIE, R.J. 1993. The East Kirkton Limestone, Viséan, of West Lothian, Scotland: introduction and stratigraphy. *Transactions of the Royal Society of Edinburgh: Earth Sciences* **84**, 177-188.
- ROWATT, T. 1936. *Report for the year 1935 on the Royal Scottish Museum*. Scottish Education Department, Edinburgh.
- SALTER, J.W. 1858. On some remains of terrestrial plants in the Old Red Sandstone of Caithness. *Quarterly Journal of the Geological Society* **14**, 72-76.
- SALTER, J.W. In MURCHISON, R. I. 1859. On the succession of the older rocks in the Northernmost Counties of Scotland; with some observations on the Orkney and Shetland Islands. *Quarterly Journal of the Geological Society* **15**, 353-421.
- SECORD, A. 2003. "Be what you would seem to be": Samuel Smiles, Thomas Edward and the making of a working-class scientific hero. *Science in Context* **16**, 147-173.
- SHARPE, T. and McCARTNEY, P.J. 1998. *The papers of H. T. De la Beche (1796-1855) in the National Museum of Wales. Geological Series no. 17*. Amgueddfeydd ac Oriolau Genedlaethol Cymru/National Museums and Galleries of Wales, Cardiff.
- SHAW, D. 1989. *The Balerno Branch and the Caley in Edinburgh*. Oakwood Press, Oxford.
- SMILES, S. 1878. *Robert Dick baker of Thurso geologist and botanist*. Murray, London.
- STACE, H.E., PETTIT, C.W.A. and WATERSTON, C.D. 1987. *Natural Science Collections in Scotland (Botany, Geology, Zoology)*. National Museums of Scotland, Edinburgh.
- STEVENSON, S. 2002. *Facing the Light: The Photography of Hill and Adamson*. National Galleries of Scotland, Edinburgh.
- SWINNEY, G.N. 2002. Reporting on the museum: the annual reports of the Edinburgh Museum of Science and Art. *Archives of natural history* **29**, 99-108.
- SWINNEY, G.N. 2007. Granny (c.1821-1887), "a zoological celebrity". *Archives of natural history* **34**, 219-228.
- TAYLOR, A. 1887. Obituary notice of Charles William Peach, A.L.S., &c., Associate. *Transactions of the Edinburgh Geological Society* **5**, 327-329.
- TAYLOR, A. 1889. Obituary notices of C. W. Peach, R. Gray, Rev. W. W. Newbould, and Professor E. Morren. *Transactions and Proceedings of the Botanical Society of Edinburgh* **17**, 11-13.
- TAYLOR, M.A. 1994. The plesiosaur's birthplace: the Bristol Institution and its contribution to vertebrate palaeontology. *Zoological Journal of the Linnean Society* **112**, 179-196.
- TAYLOR, M.A. 2002. Man of *Vestiges* - Robert Chambers 200 years on. *Edinburgh Geologist* **39**, 32-35; also http://www.edinburghgeolsoc.org/edingeologist/z_39_07.html.
- TAYLOR, M.A. 2003. [Introduction, notes, and glossary, etc.] Facsimile edition of Hugh Miller (1858) *The Cruise of the Betsey, with, Rambles of a Geologist*. National Museums of Scotland Publishing, Edinburgh.
- TAYLOR, M.A. 2007. *Hugh Miller. Stonemason, geologist, writer*. NMS Publishing, Edinburgh.
- TAYLOR, M.A. and HARTE, J.D.C. 1988. Palaeontological site conservation and the law in Britain. *Special Papers in Palaeontology* **40**, 21-39.
- TAYLOR, M.A. and TORRENS, H.S. 1987. Saleswoman to a new science: Mary Anning and the fossil fish *Squaloraja*. *Proceedings of the Dorset Natural History and Archaeological Society* **108**, 135-148.
- THOMPSON, D'A.W. 1880. Notes on *Ulodendron* and *Halonia*. *Transactions of the Edinburgh Geological Society* **3**, 341-352.
- TORRENS, H.S. 1995. Mary Anning (1799-1847) of Lyme; "the greatest fossilist the world ever knew". *British Journal for the History of Science* **28**, 257-284.
- TORRENS, H.S. 2006. Notes on 'The Amateur' in the development of British geology. *Proceedings of the Geologists' Association*, **117**, 1-8.
- TRAQUAIR, R.H. 1883. Report of the Keeper of the Natural History Collections for the year 1882. Pp. 597-600 in Archer, T. C. *Report of the Director of Edinburgh Museum of Science and Art for the year 1882*, published in *Thirtieth Report of Science and Art Department, Appendix G*, and as an extract therefrom, and also as pp. 717-720 in *Parliamentary Papers* (1883) XXVI [C.3271.].
- TRAQUAIR, R.H. 1884. Report of the Keeper of the Natural History Collections for the year 1883. Pp. 300-302 in Archer, T. C. *Report of the Director of Edinburgh Museum of Science and Art for the year 1883*, published in *Thirty-first Report of Science and Art Department, Appendix F*, and as an extract therefrom, and also as pp. 334-336 in *Parliamentary Papers* (1883) XXVIII [C.4008.].
- TRAQUAIR, R.H. 1888. Report of the Keeper of the Natural History Collections for the year 1882. Pp. 238-240 in Smith, R. M. *Report of the Director of Edinburgh Museum of Science and Art for*

1887, published in *Thirty-fifth Report of Science and Art Department, Appendix F*, pp. 301-308, and as an extract therefrom, and also as pp. 280-286 in *Parliamentary Papers* (1888) XLII [C.5279.].

TRAQUAIR, R.H. and ARCHER, T.C. 1876. Report of the Keeper of the Natural History Collections for the year 1875. Pp. 7-9 in Archer, T. C. *Report of the Director of Edinburgh Museum of Science and Art for 1875*, published also as *Twenty-third Report of Science and Art Department, Appendix G*, pp. 473-481, and as an extract therefrom, and also as pp. 607-615 in *Parliamentary Papers* (1876) XXVI [C.1543.].

TRAQUAIR, R.H. 1903. Notes on the history of the Royal Physical Society. *Proceedings of the Royal Physical Society of Edinburgh* **15**, 105-109.

TREWIN, N.H. 2004. History of research on the geology and palaeontology of the Rhynie area, Aberdeenshire, Scotland. *Transactions of the Royal Society of Edinburgh: Earth Sciences* **94**, 285-297.

WATERSTON, C.D. 1997. *Collections in context. The Museum of the Royal Society of Edinburgh and the inception of a National Museum for Scotland*. NMS Publishing, Edinburgh.

WILLIAMSON, W.C. 1871. On the organization of the fossil plants of the Coal Measures. Part I. *Philosophical Transactions of the Royal Society of London* **159**, 477-510.

WITHAM, H.T.M. 1834. A description of a fossil tree discovered in the Quarry of Craighleith. *Transactions of the Royal Society of Edinburgh* **12**, 147-152.

Appendix 1: the children of Charles and Jemima Peach

This is a provisional listing based principally on the highly centralised and now accessible Scottish records, and such English records as are currently available on the internet. It has proved impracticable within the time given to do a complete search of English records, as the Peaches, unfortunately for us, started their family well before the June 1837 introduction of centralised statutory recording of births, marriages and deaths in England, and as the statutory records are not yet machine-searchable. The Peaches married on 26 April 1829 (Oldroyd 2004b), when Jemima was about 23, and were said to have had nine children, seven sons and two daughters, of whom seven survived to maturity (e.g. Davey 1911, p. 7). We have been able to trace and identify eight, including supposedly both daughters (Jemima Mary at her death was said to be the 'eldest and only surviving daughter', death notice, *Scotsman*, 2 September 1899) and the youngest sibling in the form of the second Benjamin (Oldroyd 2004a). Two children, both male, died before maturity; one was plainly the first Benjamin, and the other was presumably the child whom we have been unable to trace, and who may well have borne the same name as one of his younger siblings.

Christian names	Date and place (or registration district) of birth	Death	Comments
Charles W[illiam]	7 June 1829 – 30 March 1830, presumably at Cromer, Norfolk.	?before 1882	Middle name inferred on assumption it was after his father. Date of birth from ages of 11 in 6 June 1841 census, 21 in 30 March 1851 census. Place of birth inferred from father's station at the time (Anon. [1882]). Date of death unknown, but he was not mentioned in his father's will of 1882
Benjamin Neeve (1)	1 February 1831, presumably at Lyme Regis, Dorset or less probably Beer, Devon. Baptised 28 February 1831, Higher Meeting (Presbyterian), Sidmouth, Devon	?before 1842	www.familysearch.org for baptism data; place of birth inferred from father's station at the time (Anon. [1882]). Not present in 1841 census and presumed to be dead by 1842 birth of his brother of the same name
William Betts	24 January 1833, Torquay, Devon	?after 1898	www.familysearch.org for birth data and marriage to Caroline Phillips on 2 September 1865 at the Old Church, St Pancras, London; identification confirmed by 1881 census, when the Peaches and their children lived in Enkel St in London, and William was a clerk with H. M. Customs and also registrar for St Giles parish. Apparently still alive when sister Jemima's will was made 6 January 1899 (q.v. below).
Jemima Mary	28 December 1834, Gorran Haven, Cornwall	1 September 1899	Birth data from www.familysearch.org . Date of death from death certificate. Was 'eldest and only surviving daughter' at death (notice, <i>Scotsman</i> , 2 September 1899).
Henery [sic] Thomas	7 April 1836, at Gorran Haven, Cornwall	?before 1882	Birth data from www.familysearch.org . Date of death unknown. Not with family in 1851 census, when he was 15 and may simply have been away from home; was not mentioned in his father's will of 1882.
Elizabeth Sarah (or Sara)	Ca. 1 December 1837-15 February 1838, at Gorran Haven (recorded at St Austell, Cornwall)	15 February 1897	Date of birth inferred from age of 59 on death certificate and from recording on birth returns for January-March 1838 (http://www.freebmd.org.uk/cgi/search.pl). CWP stationed at Gorran Haven between 1834 and 1845. Married George Hay, editor of the <i>Arbroath Guide</i> , in Wick on 6 December 1860 (www.familysearch.org ; death certificate; death notice, <i>Scotsman</i> , 16 February 1897)
Joseph James	September 1840, at Gorran Haven (recorded at St Austell, Cornwall)	28 February 1868	Date of birth estimated from age given as '9 mths' in 1841 census, made on 6 June; and confirmed by records for St Austell at http://www.freebmd.org.uk/cgi/search.pl ; CWP stationed at Gorran Haven between 1834 and 1845. Date of death from death certificate
Benjamin Neeve (2)	6 September 1842, Gorran Haven	29 January 1926	www.oxforddnb.org and death certificate; said to be the youngest sibling