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Part I

Elizabeth Catherine Thomas Carne: A 19th century Hypatia and her circle,
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ELIZABETH CATHERINE THOMAS CARNE
(1817-1873)

A 19th Century Hypatia and her circle

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[Based on a talk prepared for the Royal Geological Society of Cornwall, April, 2014]

ABSTRACT

Like the celebrated lady of Egyptian science, Hypatia of Alexandria, Elizabeth Carne's scientific accomplishments were diverse, widely regarded and admired in her own time (1817-1873), but lost to ours. In the established intellectual network of her notable father's contemporaries, and seemingly in following his scientific bent, her personal spurs can be found, not only in the geological sciences, but perhaps more importantly in her social analyses, her philanthropic efforts, her spiritual convictions and political-ecological philosophy. Elizabeth's writings bring forward that model of 'zeal for moral and intellectual improvement' that Humphry Davy highlights in his descriptions of Hypatia [3rd Geological Lecture, 1805]. Touring St Michael's Mount with Joseph Carne (1782-1858) and his 15-year old daughter Elizabeth, John Stuart Mill found her 'highly pleasing, and a little surprising, to find in this remote district...' [1832, Walking tour], and an even more remarkable person than her father. At Joseph's death she inherited his mineral collection and also took on the management of the Penzance bank of Batten, Carne & Carne which her grandfather, John Wesley's friend William Carne, had established in 1795. Geology, mineralogy, botany and not least conchology received her close attention and became subjects for her busy pen and drawings. Noted as a close observer with powerful reasoning abilities, she was said to have given 'considerable attention to mathematics, studied the classics...and acquired several modern languages.' Consciously Christian (though broad and catholic in sympathy), her social concerns, like those of her family before her, were devoted to the 'enlightenment' of the impoverished, the sick, and the uneducated. Her philanthropy, like her writings, was often hidden - due to her intense dislike of publicity - but allowed for a breadth and depth of interests cementing arts to sciences, to the clarification and benefit of both. Our knowledge of Carne, like that of many women of science, has been submerged, but in her particular case with some reason: most of her work in political economy and socio-religious ethics was rendered anonymously, or under a male pseudonym, and has been difficult to uncover and obtain. To find it again, and to review its messages, speaks to contemporary issues of human ecology, and the on-going divide between privileges and opportunities in rural and urban economies.

Introduction

The main purpose of this paper is to open a series of inter-linking doors to a collective memory of a remarkable woman of Penzance, and a former contributing member of the Royal Geological Society of Cornwall (RGSC). Though well known for her intelligence, her learning, her breadth of vision and philanthropy in her own life-time, she has dropped from sight in the welter of names of famed men of science that fill our Cornish history shelves.

A major difficulty I have found in re-introducing and representing Elizabeth Carne to a scientific audience lies in the wide-ranging spectrum of talents she possessed. Today we live

in a world of specialists, and prizes are presented mainly for single discoveries with a global impact or even a series of contributions in a single, ever more specialized, field. More difficult to recognise and realise as the geniuses that some were, are those that reached excellence in several fields of learning. Elizabeth Carne was a person we would now term a polymath, and also a woman, a type of double-blind for a student of history today.

We now live and work in a schematized world of specializations, which Elizabeth saw, described and sourced to

'... a tendency in the variety of civilization to undermine itself...as civilization marches on, its demand for greater things in mechanics, or science, or art, compels a more exclusive devotion of special gifts to special objects and healthy general development has to give way to the partial development which aims at supreme excellence in some limited department. Labour becomes more and more divided, until all the skill that can be contained in one human being may be concentrated in making the head of a pin...'

[from Part I, Chapter II, pp32-48, *Country Towns*]

Her concerns, like those of most of the gentleman-scientists¹ around her, admired colleagues and friends of her father, were to add to the greater stores of knowledge being cached in the 'age of wonder'². The difference, of course, was that she was a woman, and there were no ready platforms, academically or scientifically, from which especially thoughtful women spoke. Her first foray into book publication, under a male pseudonym, was prefaced thus:

*'Every writer has two duties; first, to receive correct impressions, and then to record them faithfully: he must try to do the first, but he is bound to do the second. It would be too much to suppose that all the impressions I have received are correct; but I have uniformly endeavoured to record them as they were received, without false colouring or exaggeration. In one respect alone have I departed from the strict letter of truth. I have used the privilege of an unknown writer in studiously disguising my own personality, only taking care that such disguise should in no respect interfere with the truth of impressions conveyed to the general reader. J.A.W.'*³

In Pool's detailed study, *History of Penzance*,⁴ she receives no mention, whereas numerous male characters, less contributory to the creation and infra-structure of the town and its surrounds, are indexed with frequency. Because she did not write local history memoirs, or antiquarian studies about local monuments, as did William Borlase⁵ she is also not constantly quoted as an authority. More recently, in Naylor's admirable historical case study analyzing the regional distinctiveness of a range of Cornish sciences and the organisations set up to promote them, she warrants only a footnote concerning her father's mineral collection.⁶ Yet at her death, the praises flowed, far exceeding any of her family previously, both locally and nationally. Under the title 'A Cornish Celebrity' the *Pall Mall Gazette* reported,

'...Miss Carne for many years largely devoted her time to the Mineralogical Museum of the Royal Geographical [sic] Society, every specimen in which she classified and arranged so that the museum

1 Self-funded scientists practiced more commonly from the Renaissance until the late 19th century, including the Victorian era, especially in England, before large-scale government and corporate funding was available. Many early fellows of the Royal Society in London were gentleman scientists. [Wikipedia: Gentleman scientist] To date I have traced up to 20 known Fellows of the Royal Society who were resident in Cornwall or frequent visitors/honorary members of the RGSC in the target period of Elizabeth Carne's life-time. She would have known their work intimately and almost all socially. Her place would have been amongst them as a Fellow, if she had been a male.

2 The title of Richard Holmes' biographical exploration of *'How the Romantic Generation discovered the Beauty and Terror of Science'* in which he describes the excitement and energy of the 'second scientific revolution' as so entitled by Coleridge, and into the middle of which Elizabeth Carne was born.

3 John Altrayd Wittititterly (1860) *Three months' rest at Pau, in the winter and spring of 1859*. Elizabeth's first full-length book publication issued under this pseudonym.

4 P A S Pool (1974) *The History of the Town and Borough of Penzance* Penzance: The Corporation. A catalogue of documented facts to which all local historians turn on the history of West Cornwall.

5 The Rev William Borlase FRS (1695-1772) Cornish antiquary, geologist and naturalist, Vicar of Ludgvan and St Just.

6 Simon Naylor (2010) *Regionalizing Science: Placing Knowledges in Victorian England* London: Pickering & Chatto 194 n29

7 This is a faulty reference to the London-based Geographical Society formed in 1830, of which her father was a member. However it is made clear in the Annual Report of Council (RGSC) 1873, in the President's Address p31, that this reference was to the grouping, placing and labelling of the Society's

was regarded as a model of method. She was thoroughly versed in geology and mineralogy, and contributed many papers⁸ to the Royal Cornwall Geological Society... Her benevolence was as great as her attainments were rare, and in addition to large benefactions in more ordinary channels, Miss Carne lately offered to build a new wing to the local mineralogical museum and furnish it with the mineral collection, valued at £3,000, which her father had amassed. This project having fallen through, Miss Carne resolved to build a museum of her own at Penzance, and this is now approaching completion'.⁹

It should not be said that Elizabeth Carne is completely unknown, though the analytic content of her published work remains shrouded. She was to become a full member of the RGSC in 1865, eight years before she died, and had presented a paper five years earlier (c1860), two years after her father's death. No other woman had done this previously, and she was the first woman elected to the Society.

Elizabeth was, latterly, along with her older sister Caroline, an individual subscribing member of the Royal Cornwall Polytechnic Society at Falmouth, of which her father had been a Vice President and council member until shortly before his death. Her life is recounted in the *Dictionary of National Biography*, as is that of her father Joseph Carne¹⁰ and her Uncle John Carne¹¹ and a healthy quantity of her kin. Virtually all of those worthies were male in keeping with 19th century morés of class and gender, with a few notable exceptions.¹² Only last year, one of the four rooms established within the new Environmental and Sustainability Institute for the University of Exeter's programmes of study at the Penryn campus, has been named in her honour.¹³

The lack of widespread knowledge of her pioneer status - as both an early social scientist and a natural philosopher - is due to the fact that she wrote anonymously. Until her geological papers were read to the RGSC and her final full-length volume, *The Realm of Truth*, was published, her name as an author or scholar was unknown. Her draughtsmanship, as demonstrated in her conchology notebook, and her pure artistry as a painter, remain completely unknown to the public even now, as they were never exhibited, have not been published or noticed, and lie in un-researched archives in Cornwall.¹⁴

One beautifully executed notebook [28 pages] or diary of the conchology of the Land's End and Scillies, is located at the Morrab Library [See Plate 1.] and three large volumes of her sketches and watercolours - many of geological formations in fine, precise detail, undertaken in Europe, elsewhere in England and also in Cornwall and the Isles of Scilly over a 30 year period - are lodged with the Polwhele family records at the Cornwall Records Office.¹⁵ Why such a collection should be located with the famous Polwhele family papers, interested me, and it has been fascinating to discover and document the family connection of the two

specimens at the Museum, when it was first laid out in St John's Hall by 'our lamented friend assisted by her excellent and unwearied elder sister plodding for month after month' in that work.

8 Four are identified in reference material of the RGSC, two of which appeared posthumously.

9 *Pall Mall Gazette*, 9 Sept 1873, p 5. It is believed that a private museum of geology was constructed at Coulsdon Terrace for the Carne mineral collections, and this was moved after Elizabeth's death to a special set of rooms at 'Carne' (now renamed), the large home constructed at Heamoor by her nephew Charles Campbell Ross.

10 Joseph took his early schooling in Penzance and later at Keynsham Methodist school near Bristol. Initially he was a mining engineer and adventurer, and at 25 became the managing partner of the Cornish Copper Company at the port of Hayle. He was Hon Treasurer and Trustee of the RGSC, Vice President of the RCPS at Falmouth and Fellow of the Royal Society from 1818. He was a founder member of the Morrab Library (Penzance Library as it was then known) and its President for many years. A JP and Mayor of Penzance, he was also head of Methodist missions for the western region.

11 John Carne, a younger brother of Joseph, and author of *Letters from the East* and *Tales from the West* and other novels, poems and reference works. He was well known locally, as was Humphry Davy for the same reason, as a mesmerizing story-teller who could entertain groups of listeners and children for hours on end. 'Christopher North' (aka John Wilson, FRSE, Professor of Moral Philosophy, Edinburgh), principal writer for *Blackwood's Magazine*, said 'Mr Carne was the most wonderful story-teller I ever listened to.' [See *John Carne, Letters 1813-1837* On-line]

12 The second cousins of Elizabeth Carne were the famous Brontë children of Haworth, Yorkshire.

13 The Environmental and Sustainability Institute, Exeter University in Cornwall, Penryn, Falmouth, Cornwall. Opened 2013.

14 'British shells' at Morrab Library, Penzance, and three large bound sketchbooks at Cornwall Records Office.

15 Polwhele family of St Clement, NRA 4188, Reference PW, Sketches in Europe and Scillies 1832-1952, by E C T Carne, whose niece married T R Polwhele in 1861.

families, through the marriage of a niece of Elizabeth's, a granddaughter of Joseph Carne, Fanny, to Thomas Polwhele of Polwhele.¹⁶ This Polwhele was to become the Deputy Warden of the Stannaries and also the President of the RGSC.

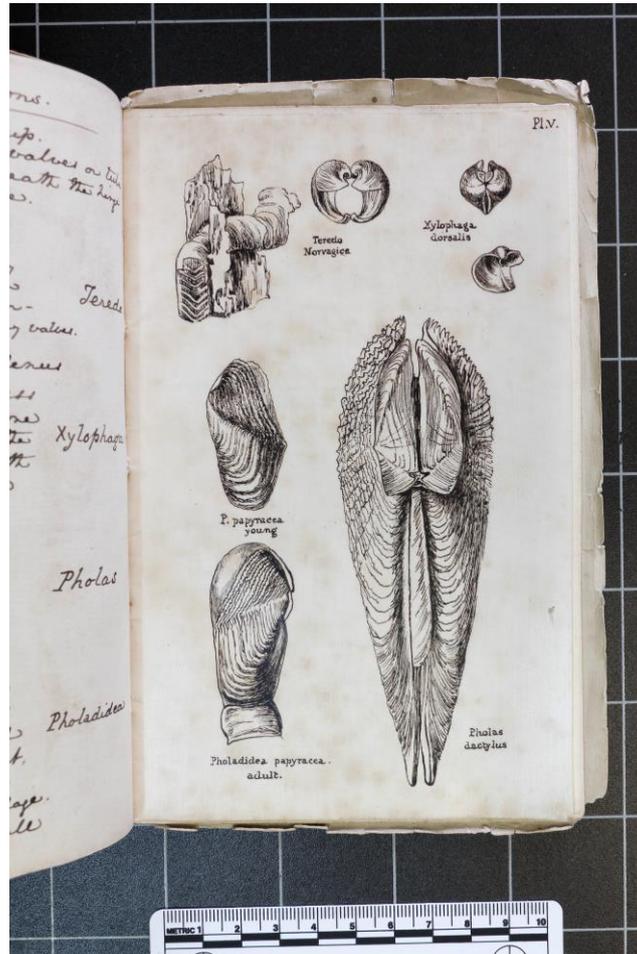


Figure 1: From 'British Shells' drawn & annotated by Elizabeth Carne (nd)
By courtesy of the Morrab Library Photographic Archive
Photos by J Pozzi and T Goskar

Only three months after the spring publication in 1873 of *The Realm of Truth* she died at the early age of 55, thereby closing any opportunities for following the progression of her interests. John Stuart Mill, who found her so remarkable at 15 when he was himself 26 years old, pre-deceased her in the same year by three months.¹⁷ Intellectually these two had a great deal in common, and she is found in her writings to be questioning his ideas and commenting on his opinions to the last. Possibly he was one channel, as an active essayist and journalist¹⁸, through which her early letters on poverty and social reform may have found publication, but there is no direct evidence of this. Other influences would include her uncle John Carne, a primary format for whom were 'letters' based on his travels on the continent and in the near

16 Thomas Roxburgh Polwhele, Esq. On the Geological Survey 1857-62, FGS, FRGSC, and nephew who received the family estates of Richard Polwhele, the author of the histories of Devon and Cornwall.

17 Another acquaintance, Professor Adam Sedgwick of Cambridge had also died at the beginning of the same year. He is described as one of the founders of modern geology. The Carne Mineral Collection, cared for by Elizabeth Carne in her life-time, is now located at the Sedgwick Museum of Earth Sciences, Cambridge.

18 JSM was Editor of the (new) *London Review* from 1834, which merged with the *Westminster Review* which he had edited with his father James Mill, to become the *Westminster & London Review* in 1836 on the death of his father, and the following year he also became its owner and publisher. Her early anonymous articles are consistently reported to have been published in the *London Quarterly Review*, for which Robert Southey and Sir Walter Scott also wrote. Both of these authors were known personally to Elizabeth's Uncle John Carne. [See *John Carne, Letters 1813-1837*]

east [Footnote 11]. It is plausible that she also wrote many other anonymous articles and book reviews for various journals, but as yet these are not identified.¹⁹

In summing up her scientific impact locally, the anonymous tribute to her was stated thus: *'Science, especially a branch of it which called the far West one of its earliest homes – however widely it has since travelled – owed much to her pen, and more to her generous aid in providing fit habitations [museums and schools] for unrivalled specimens illustrative of geology and mineralogy.'*²⁰ Like Hypatia, she was rooted and supportive of the 'here and now', and her empirical mission was to move forward on all fronts in the arts, sciences, theology and education.

Women and Science

Significant 'women of science' in British history and in this county's story are possibly more numerous than we suspect, but not easily found. This gap in the written record occurs for a long list of culturally-patterned reasons to do with authority, authenticity and trust amongst male-dominated fraternities. Women's ideas in intellectual history have been monitored, moderated and made known, often without reference or attribution, through the lens of male observations, conflicts, descriptions and publications. Because there were no fixed platforms for channelling and presenting women's findings, influence may have been great (or not) but we would not know it. Public records of women with a few notable exceptions are virtually absent from the 18th century and well into the next.²¹ Especially scarce is information on what women have contributed to cultural, scientific and educational life – a kind of looming shadowy cloud that makes one have to search minutely for where they hung their thinking caps. Exactly how their lives and interests overlapped with those of their fathers, brothers and sons is not easily traceable. Women's spheres were largely domestic and family-centric, and, in the middle classes, artistic and philanthropic. Their intellectual achievements went mostly un-remarked, unless a son, brother or husband happened to make the occasional tribute in the course of their own published work.

How and why this kind of submergence 'of the truth' or conspiracy of silence arose as a social characteristic of the class system, and became wilfully enshrined in custom and tradition by men and women alike, is open to much theoretical study and discussion, but will not be explored further here. Instead, I will use this brief paper to recall and honour an important early woman of scientific interests, who like Hypatia of Alexandria, is an exemplar for all time. Undoubtedly there are more women of science to find in Cornwall's history²², but choosing Elizabeth Carne, the first woman member of the RGSC on this occasion brings forward a pioneering figure in the history of a new field of scientific activity, which today we have entitled human ecology or social ecology.

'Our knowledge is composed not of facts, but of the relations which facts and ideas bear to themselves and to each other; and real knowledge consists not in an acquaintance with facts, which only makes a pedant, but in the use of facts, which makes a philosopher. Looking at knowledge in this way, we shall find that it has three divisions – Method, Science, and Art.'
Henry Thomas Buckle, 1858²³

¹⁹ Caroline Fox in her *Journals and Letters*, Vol II, refers to miscellaneous writings by Elizabeth which she has read.

²⁰ 'Death of Miss Elizabeth Carne of Penzance' *Cornish Telegraph*, 10 Sept 1873

²¹ Courtney in his studies of early Cornish naming patterns and parish registers, comments on the sparse details of women: '...I need hardly say this list seems to refer to sons alone, daughters being evidently of no account, as you would find if you examined the pages of Mr Millett's book, where the women in the Marriage Register are as a rule entered with a Christian name only.'

²² Naylor, S (2010) Cited in Introduction, makes a compelling case for the botanist Elizabeth Warren of St Clements, Truro. Clifford Evans in *A Passion for Nature* (Dare & Hardie, 2008) equally provides an excellent case for Emily Stackhouse. Stella M Turk, in our own time is a candidate, whose natural history and conchology studies have enlightened greatly. Another contemporary is Jean Lawman, author of *Natural History of Land's End* Padstow: Tabb House.

²³ Henry Thomas Buckle (1821-1862) On 19 March 1858 he delivered a public lecture at the Royal Institution on the 'Influence of Women on the Progress of Knowledge', later published in *Fraser's Magazine* for April 1858. Caroline Fox and Elizabeth Carne correspond about his unfinished work on the *History of Civilization in England*.

**Hypatia of Alexandria
(c355-415 AD)**

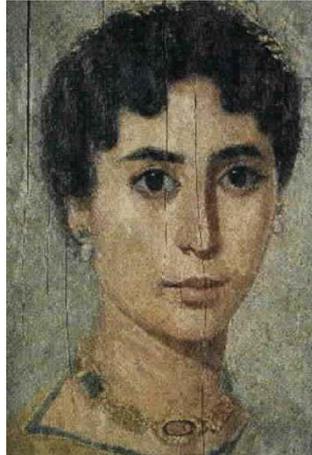


Figure 2: From Euphrosyne Doxiadis (1995): [The Mysterious Fayum Portraits: Faces from Ancient Egypt, Portrait of a woman, probably from er-Rubayat, c. 160-170 AD](#) British Museum, London, An idea of how Hypatia might have looked.

As a necessary parallel in my tribute to Elizabeth Carne, I must explain the reasoning behind the title of this paper and my references to her as a modern-day Hypatia. My personal long-term interest as a book collector is in the biography and works of women. In 1996 Sir Geoffrey Holland, then Vice-Chancellor of the University of Exeter, invited me to provide a name for the large collection of books and journals about women's history that my husband and I presented to the Library there.²⁴

After scouring the history books for an iconic woman of international stature, a friend handed me a copy of a little book that her mother had written and published in 1925. It was called *Hypatia - Woman and knowledge*, and the author was the educationalist, philosopher and social campaigner, Dora Russell. Dora retired to Cornwall in 1962 after a long and inspirational life in experimental education, and continued to write on topics of social and political welfare with a curiosity and an enthusiasm that could not be ignored.²⁵ She employed Hypatia's untimely and barbarous death at the hands of a Christian mob, as symbolic of the way in which women's ideas and interests have been both largely overlooked and sometimes fatally quashed, in the face of men's oft-ambitious needs for power and authority. This was my first introduction to Hypatia of Alexandria, and her contributions to civic life and to the sciences of 4th Century AD.

However, I was soon to find more, and rather closer to home. In the third geology lecture by Humphry Davy, delivered in 1805 at the Royal Institution in London (RI), he evokes the memory of 'this celebrated lady':

'The school of Alexandria produced several laborious geometricians; but the greatest ornament belonging to it and the most illustrious philosopher of the age was Hypatia, the daughter of Theon. This celebrated lady is said to have been equally distinguished for her skill in mathematics, in general science, and in the knowledge of nature and of the earth. And that she applied herself to experiment is evident from one of her inventions, the hydrometer, the instrument now in common use for ascertaining the relative weights of fluids.'

²⁴ The Hypatia Collection of Women's History, Special Collections Library, University of Exeter, Exeter, Devon. On-line catalogue available.

²⁵ Dora wrote 'Religion and the Machine Age' in 1982 and three volumes of autobiography, *The Tamarisk Tree* (1977, 1981, 1985) after her retirement. In 1998, Katherine Russell Tait, wrote a monograph in our series of Hypatia Publications (Patten People) entitled *Carn Voel, My Mother's House*. Much earlier she had authored a biography about her father, the philosopher Bertrand Russell, entitled *My Father*. Dora Black Russell died at Porthcurno in 1986 at the age of 92.

*Hypatia taught after her father's death in her native city. By the eloquence and soundness of her instructions she excited the highest zeal for moral and intellectual improvement amongst her disciples. She was no less admirable for talent and virtue of mind than from the beauty and loveliness of her person. And she shone with great lustre being as it were a single brilliant star in the night of clouds and obscurity.'*²⁶

Her father Theon, was a Greek-Egyptian mathematician and teacher who edited and interpreted the *Elements of Euclid*, amongst other educational texts in the scientific history of his time. His daughter learned from him and later assisted him, adding to his work. She edited and annotated works by such authors as Diophantus and Ptolemy and is credited also with some early advances concerning the projection of the sphere and the making of scientific instruments for astronomical use. Her edited work *On the Conics of Apollonius* brought forward the ideas of hyperbolas, parabolas, and ellipses. Hypatia was the first woman to have a widely acknowledged impact on the survival of early thought in mathematics, despite the almost complete loss of her written work.

Her circle of colleagues and followers formed a community based on neo-Platonic systems of thought and intellectual ties. Through private teaching and public lectures, her fame was such that she became the natural advisor on current issues far and wide. Hypatia was regarded as a model of ethical courage, righteousness, veracity, civic devotion and intellectual prowess. A moral authority of great influence, and thereby a threat to the Christian patriarch, Cyril (later St Cyril), within the larger political upheavals of 415AD she was assassinated.²⁷

Learning more of Hypatia's life as a teacher, scientist, editor and inventor resulted in deciding to choose her name for the Exeter University collection and for the research-based foundation entitled the Hypatia Trust, which was established to encourage the study of women's ideas and achievements. So, who was Elizabeth, and why should we want to know more about this social ecologist and modern-day Hypatia?

**Elizabeth C T Carne
(1817-1873)**

²⁶ *Four Hitherto Unpublished Geological Lectures Given by Sir Humphry Davy in 1805*, introduction & notes by the late Professor Alexander M Ospovat (d 2010), RGSC Transactions Vol XXI, Pt 1 (1978)

²⁷ Brief biography taken from the Hypatia Trust website: www.hypatia-trust.org.uk



Figure 3:
'Miss Elizabeth Carne of Chapel Street'
Geoffrey Harvey Album of Cartes d' visite
Morrab Library Photographic Archives

The person of Elizabeth Carne

Elizabeth Catherine Thomas Carne was born in Riviere House²⁸, a large Georgian mansion overlooking the busy shipping port and harbour of Hayle in 1817. She was the seventh child of the eight born into the wealthy family of mining engineer, geologist and latterly merchant banker Joseph Carne and his wife, the former Mary Thomas²⁹ of Wales, the daughter of a medical family. Applied sciences can be said to be in the blood on both sides.

Also at the heart of both families were firm Wesleyan Methodist beliefs in education as the prime tool for re-energising the Church of England and raising public living standards generally. Equally realised was the need to combat the social ills and spiritual neglect realised so vividly around them: 'the rudeness of the peasantry, the brutality of the town populace, the prevalence of drunkenness, the growth of impiety, the general deadness to religion.'³⁰ Methodism was taken up widely in Cornwall to the point of its becoming the 'established religion' of the county³¹ and this revolution in tandem with the massive industrialization of the whole area and country had begun in the youths of Elizabeth's grandparents who were very much alive and influential, active Methodists in her early years.³²

At the age of 25, in the year prior to his marriage, Joseph had succeeded to the position of managing partner in the Cornish Copper Company (CCC), a large copper-smelting firm, in

28 The Cornish Copper Company had built the large, impressive mansion (still standing today) for the use of their Manager, John Edwards in 1791, and Joseph Carne became its second occupant sixteen years later, when 'Dr' Edwards died suddenly in January 1807 after 40 years service. A laboratory occupied the cellars of the house, and it was here that Davies Giddy brought young Humphry Davy to view the research environment for the first time.

29 Her father was a medical doctor and surgeon, part of the Thomas family of Kidwelly, Glamorgan, and the young couple married in Haverfordwest. How they met is not known, but the Carne family originally came from Glamorgan.

30 Robert Southey (1820) *The Life of Wesley* p177 At the time of publishing this biography of Wesley, Joseph's younger brother John Carne, later to be a prolific writer himself, was staying in the home of Robert Southey in the Lake District, and Wesley's biography was under discussion. See note 11.

31 John Horner (2010) *Even in this Place, 19th-century Nonconformists & Life in the Borough of Penzance* p9

32 Her grandmother died when she was five years old, but her greatly respected grandfather lived on until Elizabeth was 19 years old, and was a bulwark in the family biography.

which his father William Carne (1754-1836)³³ was already a partner. Joseph from an early age had shown immense interest in the collecting of ore specimens and minerals occurring in them, from the mines that his father represented as agent around Gwennap, Gwinear, St Just and elsewhere. Of all his children, Elizabeth was to become the one with whom this geological passion would be shared.

Taking over from the much respected John Edwards was not simple and straightforward for young Joseph. He was to step into the complex Hayle harbour disputes, locally named the 'Thirty Years' War' which pre-dated and post-dated the Napoleonic wars, covering the approximate period of 1790 to 1820.³⁴ This was a time of unprecedented strife in West Cornwall that stemmed from the attempts of the CCC to preserve its monopoly of its trade and the attendant industries that the copper smelting trade supported. The quarrels had to do with rights to dredge, to tie up for delivery and export, and to position floodgates regulating tidewaters from Hayle Pool, which stood at the confluence of five streams leading to the bay. The length of loading quays and the ending of long leases were necessarily of utmost importance to the competing companies.

The adversaries in that war were the engine builders, shipwrights and merchants making up the company known as 'Harveys of Hayle' which was begun in 1779, three years before Joseph Carne came into the world. '...a village blacksmith, John Harvey, moved his forge to the coast, at the Hayle estuary, and there also built a small iron foundry – the very first to be set up in Cornwall...John bought coal for his furnace from a local company of copper-smelters [CCC] who imported it in their own vessels from south Wales.' The scene was set for the wars to commence when Harvey bought his own shipping vessel and began to supply the mines independently that CCC had formerly served.

Pascoe in his *History of the CCC* sums up Joseph's approach to his new job thus: '[He] seemed to take the same course as his predecessor – viz. that Harvey's was a bitter trade rival to be fought strenuously at every opportunity. This rivalry between the two firms at management level was also extended to the workshop floor, to the workmen, the labourers and even to their families. Pitched battles between the two factions continued to be fought at the slightest provocation. It is a fact that long after the CCC had closed down the enmity between the two ends of Hayle persisted and an invisible barrier survived for many decades afterwards.'³⁵ The legends are used also to explain the geographical arrangement of Hayle town, split into two centres of commerce – 'Copperhouse' and 'Foundry'.

The full story of the conflicts is fascinating, of course, and sets the rough and tumble scene into which Elizabeth Carne was born, following on from two brothers and four sisters. She was the final child to be born at Riviere House, however, and her siblings would have experienced much more of the stress and tension of those particular times. Joseph Carne resigned as manager in 1818 as the copper smelting came to an end. By the time Elizabeth was a toddler, her family had re-settled in Penzance on Chapel Street, and her younger brother had been born and died there in the short space of a year. Hence Elizabeth for the remainder of her life was the youngest child of this branch of the Carne family in Cornwall. See a simplified Carne family tree at Appendix 2.

By the time of Elizabeth Carne's birth the formal split between Anglicans and Methodists had been made (c1814) though it had been foreshadowed even in Wesley's lifetime (died 1791). There were already ten nonconformist congregations meeting in their own buildings in the

33 William Carne was the original builder of the family fortunes, mine agent and adventurer, ship owner (3) and banker. His home was situated adjacent to St Mary's Church, the former Arts Club building at the bottom of Chapel Street, Penzance, and this was where John Wesley was accommodated on his final visit to West Cornwall in 1789.

34 Closely described from CCC perspective in W H Pascoe (1981): *The History of the CCC*, Chp IV, and from Harvey's view in E Vale (1966): *The Harveys of Hayle*, in which Joseph Carne is called 'that wicked Joseph Carne'.

35 W H Pascoe op cit p68

borough of Penzance at that time. In his perceptive study of non-conformist groups in this district, John Horner³⁶, a former Methodist minister and author, points to the respectability and social standing brought to the causes of the Wesley societies by its association with the Carne family and its patriarch William Carne, as well as with their kin, the Branwells. The eventual broadening or widening of spiritual paths, is usually characterised as splintering or splitting from the Anglican perspective, but served, I believe, and certainly in the personal actions and beliefs bequeathed to Elizabeth within family tradition, to offer an expansive tolerance of independent thinking and widespread opportunities for service to all classes of society.³⁷

When working on an earlier research paper about ‘visitors to Cornwall’ for an Institute of Cornish Studies Conference, I came across the journals of John Stuart Mill with his 1832 ‘Walking Tour of Cornwall’³⁸. In walking with his friend John Austin³⁹, they came upon the turning down the valley to Lamorna Cove.

‘The scene was not grand but singularly beautiful. The little narrow point where the valley joined the sea – beach I cannot call it – was covered with huge lumps of granite, rounded like pebbles by the waves and giving a tremendous notion of the seas which could achieve such a feat. But these cannot be our modern seas, if as we were afterwards told by Mr Carne (footnote 22, p 625), the geologist,⁴⁰ of Penzance, it be true that wherever these boulders (as they are termed) are found on the coast, a great bed of similar ones is discovered underground in the interior.’

They continued on their way until the 6th day when they passed ‘the whole of this day in the neighbourhood of Penzance, and a greater part of it in seeing St Michael’s Mount, to which we went with Mr Carne, the geologist of Penzance, and his daughter; both of them remarkable people, and the latter in particular such a person as it is highly pleasing, and a little surprising, to find in this remote district...’ Following the latter quote, footnote 29 states the following: ‘Joseph Carne’s most eminent daughter was his fourth [sic], Elizabeth Catherine Thomas Carne (1817-73), who later wrote popular works and contributed papers to the Royal Cornwall Geological Society; she was only fifteen years old at this time, but Mill at fifteen was himself a “remarkable person.”’ [Editor: John M Robson]

From these few references I began to study the family connections and family trees of Joseph and his daughter Elizabeth. Their original entries in the *Dictionary of National Biography* were contributed by other worthies of the literary world, e.g. Robert Hunt⁴¹, the scientific writer and folklorist, and G C Boase⁴², the historian and dictionary writer. In the new edition of the *Dictionary of National Biography*, their entries were edited by the more recent biographer of the RGSC itself, Dr Denise Crook⁴³.

36 John Horner (2010) ‘Even in this place’, 23-5 [William Carne’s] involvement in the Wesleyan cause was known so widely that he was called the ‘father of Cornish Methodism. Upon his death 24 carriages followed his coffin to the family vault in Gulval church, while shops in the town closed during the obsequies.’

37 Richard Treffry, Methodist minister, wrote about William Carne: “Nothing can exceed his cheerfulness and kindness. I find it a great privilege to be under his conduct as a leader...there is that sort of influence connected with himself that no one, I think, can come into cordial contact with him without being better.’ Quoted by Keith Austin in his informative weblog: ‘A history of Methodism and Penzance Wesleyan Society’ Timeline, accessed 2013.

38 John Stuart Mill (1806-1873) ‘33. Walking Tour of Cornwall, 3-9 October, 1832’, first notebook, Mill-Taylor Collection, Vol XXXVII, second notebook. Edited by John M. Robson, University of Toronto Press and Routledge. This off-print part of *Journals and Debating Speeches*.

39 John Austin (1790-1859) is noticed primarily for being arguably the first writer to approach the theory of law analytically, and obtained appointment to the first Chair of Jurisprudence at the recently established University of London. In 1832 he published *Province of Jurisprudence Determined*. [Stanford *Encyclopaedia of Philosophy*]

40 Joseph Carne, FRS (1782-1858) Founding member of the Royal Geological Society of Cornwall in 1814. Carne became the successor to John Edwards in 1807 as Manager of the Cornish Copper Company (CCC), in which his father William Carne of Penzance was already a partner. Business from 1807 for the CCC was carried forward under the firm’s name of Mitchell, Trevenen and Carne. See W H Pascoe, CCC.

41 Robert Hunt FRS (1807-1887) Best known, currently, for his *Popular Romances of the West of England* (London, 1865), and sometime secretary from 1840 of the Royal Cornwall Polytechnic Society of Falmouth. In 1858 with the RCPS he founded The Miners Association.

42 George Clement Boase (1829-1897) Featured in the *DNB* as a ‘bibliographer’, but as a historian and social scientist, he was the joint author with W P Courtney of the *Bibliotheca Cornubiensis* (1874-82) and the sole author of its partner-volume, the *Collectanea Cornubiensia* (1890).

43 Denise Crook (1991) ‘The Origins of the Royal Geological Society of Cornwall’ [in] *Transactions of the Royal Geological Society of Cornwall* Vol XXI, Part 5

**Joseph Carne FRS, Elizabeth's father
(1782-1858)**

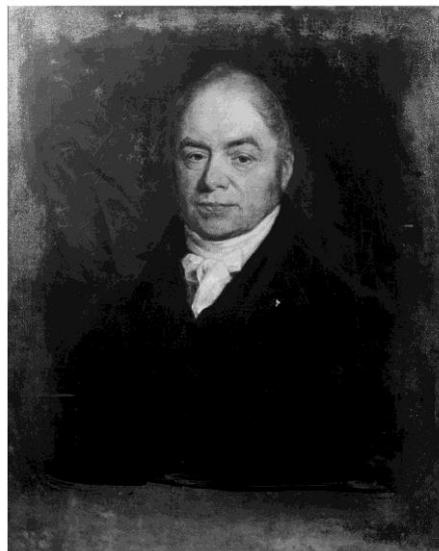


Figure 4:
©Morrab Library, Penzance
Attributed to the circle of William Owen RA (1769-1825)

The family ethos was one of serious thought, hard and methodical work, and a strong leaning toward community and civic service in the same modest and unassuming ways practiced by the Quaker community. Elizabeth's aims were plainly stated in her books, and these were to work for the integration and health of communities, and for the destruction of the suffocating class system, which in turn threatened land reform. In country towns rather than big cities she saw the greater opportunity for breaking down class barriers through knowing one's neighbours, sharing an integrated schooling for children and adults, and simply growing up together in a natural environment near green fields, woods and the sea. From this close personal involvement had sprung her own love of shells, minerals, and geological formations – which she would proceed to depict in her art works, and also in her recorded observations and scientific papers.

Despite their great riches, Mill was to note in his journal, he was astonished at the simplicity and unpretentious manner in which the Carne family lived. Later, in attempting to explain herself and her self-perceived inability to form close affectionate friendships, Elizabeth wrote to her friend, Emily Bolitho⁴⁴, the following characterisation of her family: *'All my family have a certain coldness of disposition which is our misfortune; we cannot help it, but it causes, in general, a most unamiable and unpopular indifference to all the usual modes of showing affection... You complimented me once on being so much more gentle than I used to be, but the family disposition still remains,--improved perhaps, but I am afraid not capable of much further improvement...'*

Released by her family wealth from the necessity of taking up occupation outside the home as a governess or teacher, Carne was free, in her early years, to expand her reading, travel and general education in all directions. Nonetheless, from the age of 18, with her sister Caroline, she held primary domestic responsibility when her invalid mother died. The eldest son, also

⁴⁴ The Bolithos are large property owners in West Cornwall. They also opened a bank, a decade after John Batten and William Carne, which latterly became Barclays Bolitho Bank, and the family owned a smelting works at Chyandour near their home. Joseph Carne was also a close business partner (in mining) of the Bolithos. The Carnes, Bolithos and Battens all served as Mayors and Town Councillors and public servants in various capacities.

Joseph (1809-1831), had died four years previously in Madeira after a gentlemen's education at Charterhouse School, London⁴⁵ followed by Trinity College, Cambridge.

In 1832, Joseph Sr's youngest brother James (1794-1832) died with his wife Charlotte, in nursing their parishioners through a cholera outbreak in Plymouth.⁴⁶ Two of Elizabeth's older sisters married and left home, Mary to a British surgeon resident in Madeira, and Anna to a wealthy medical man of Edinburgh. At least three of his brother's young children were brought up and supported by Joseph in their Penzance home. When Joseph's remaining son, William, died in 1852, his little daughter was also taken in to the family. This was the province of the eldest son of a wealthy family where primogeniture was the rule.⁴⁷ The large Carne home was a family refuge for many and a Methodist refuge for travelling ministers.

In 1873 the local newspaper, the *Cornish Telegraph*, published her obituary; it lauded her standing as a thinker and a scientist, but is also commented on how she was regarded by all who knew her:

Miss Carne added a greatness of heart which made her beloved by all who knew her... .. on Monday morning the whole town of Penzance mourned as for the demise of a personal friend.

This remarkable woman was clearly not regarded by the citizens of Penzance as having 'a cold disposition' or an unfortunately 'unamiable indifference' to shows of affection, but was loved and honoured by all.

A distinguished circle of friends & correspondents

Elizabeth first came to my notice, through reading the invaluable published diaries of Caroline Fox, the dedicated diarist and traveller of the Quaker shipping family of Falmouth, Cornwall.⁴⁸ They exchanged numerous letters in the fifteen year period leading up to the end of Caroline's life in 1871 but it is clear that they were known to each other much earlier and were the dearest of friends. Caroline, addressed her friend fondly as 'Excellentissima' and 'Good Queen Bess' and faithfully related her travels, her reading, and her scientific interests. Caroline penned her final letter in 1871 to Elizabeth, seven days prior to her death, '*in hopes of a happy meeting whenever the fitting time may come, and with very loving wishes for the new-born year.*'

⁴⁵ Joseph Carne Jr was a house-mate and friend of William Makepeace Thackeray at Charterhouse, and followed on with him to become a student of William Whewell, FRS and Hon RGSC later, at Trinity College, Cambridge. In Charterhouse archives, he is recorded to have been one of the finest and frequent speakers at the Cambridge Union of his time.

⁴⁶ The Rev James Carne DD was vicar of the parish of St Charles, Plymouth at the time, having served a curacy at Sancreed, West Cornwall previously.

⁴⁷ William Sr's great fortune was in the hands of Joseph with the responsibility of looking after his brothers' lives and families. In the absence of sons of his own, this responsibility would come to his executors and Elizabeth in due course. The burden was heavy. See *Three Months Rest at Pau*, pp 42-6.

⁴⁸ Caroline Fox (1819-1871) *Memories of Old Friends, being 'Her Journals and Letters'* 2 vols, as edited by her kinsman Horace Pym with the assistance of her sister Anna Maria Fox. Caroline Fox's journals are a major historical resource for the study of genteel middle-class and Quaker life in the 19th century. Her personal connections with major national figures in literary and scientific circles are numerous, including John Stuart Mill, the Coleridge family, Elizabeth Fry, the Gurney family, the Barclay family, Adam Sedgwick, John Sterling, F D Maurice, Thomas Carlyle and many others.

Caroline Fox (1819-1871)



Figure 5: Image, an etching by H Herkomer from a painting by Samuel Laurence

Flynn⁴⁹ in his collection of Cornish memories at the end of the 19th century tells us: 'I think the most remarkable women of the county, in those days, were to be found amongst the Society of Friends, or Quakers... Caroline Fox had one of the brightest intellects amongst the women of the last century. She numbered amongst her friends such men as Carlyle, John Sterling, Bunsen, Humphrey Lloyd, with many other literary and scientific celebrities, and her memoirs – chiefly letters, and extracts from a charming journal – exhibit powers of mind rarely met with in any circle.' Despite the ever-present references to outstanding men, outstanding women were also her confidants, such as Jane Carlyle, her cousin Elizabeth Fry (the prison reformer), another cousin, the poet Jane Fox Crewdson⁵⁰ and not least, Elizabeth Carne, her most excellent friend. The Fox home at Penjerrick, Flynn describes as a 'Quaker Little Gidding'⁵¹, a centre of love and prayer and philanthropy based on family life. 'There you might meet with statesmen, Fellows of the Royal Society, church dignitaries, nonconformist ministers, temperance lecturers, town missionaries, deaconesses and Bible women, all welcome and all happy...'

Caroline's letters to Elizabeth concern the books that she and her sister Anna Maria were reading primarily of political and scientific content, of the doings of her brother, Barclay Fox⁵² and his friends and of the many eminent people she met when travelling. Often she is describing lectures and meetings she has attended, or conversations that she has had with people that Elizabeth also knew. She comments and discusses articles and publications that Elizabeth has written, though this can only be ascertained by cross-referencing Caroline's dated letters with Elizabeth's texts, as the tone is conversational, and often humorous, not

49 J S Flynn (1917) *Cornwall Forty Years After* 161-3

50 Jane Fox was the daughter of George Fox, mining partner to his brother in the Perran mine at Perran-arworthal, for which William Carne Sr was also an agent. She married Thomas Dillworth Crewdson, a Manchester manufacturer, and the author of a number of hymns and two volumes of poetry, *Aunt Jane's Verses for Children* (1851, '55 and '71) and *Lays of the Reformation and other Lyrics* (1860).

51 Nicholas Ferrar, born in 1592, was the founder of a religious community that lasted from 1626 to 1646. After Nicholas had been ordained as a deacon, he and his family and a few friends retired to Little Gidding, Huntingdonshire, England, to devote themselves to a life of prayer, fasting, and almsgiving (Matthew 6:2,5,16). They restored the abandoned church building, and became responsible for regular services there.

<http://justus.anglican.org/resources/bio/295.html>

52 R L Brett, Ed (1979) *Barclay Fox's Journal* London: Bell & Hayman

therefore revealing [for our curiosity] dates and titles in good academic fashion. It is clear that the two women were zealous readers of contemporary journals and were abreast of major debates of the day.

Into the Fox home at Penjerrick and into the Carne family home in Chapel Street, Penzance, came such important travellers in intellectual circles as Henry de la Beche of the Geographical Survey, Professor Adam Sedgwick of Cambridge after whom the present-day museum of earth sciences⁵³ at Cambridge is named, Captain Fitzroy just returned from 5 years on the *Beagle* with Darwin, and not least John Stuart Mill, the political philosopher, amongst many others. De la Beche and Sedgwick, by the 1840s were both Honorary Members of the RGSC, as were the men of the Fox family, and their cousins.

With her father and family Caroline was frequently in London, Cambridge and around Britain and Ireland to Quaker meetings, of which they were faithful members, and to such gatherings as the British Association for the Advancement of Science⁵⁴. Equally Elizabeth Carne and her family spent the winter season most years in London visiting the museums and attending lectures, churches where their friends preached and then going on to a spring season abroad, often with clergy friends. Following her father's death, she also maintained lodgings for business purposes in Great Ormond Street, London. From the few sources that have been found to date, she carried on a lively correspondence with her circle of friends and family throughout her life. However, no diaries have been discovered for her, nor have any letters to Caroline Fox, our main informant, been found.

The closest to a journal that Elizabeth wrote – and which gives us much personal voice – is her first published work, *Three Months' Rest at Pau*.⁵⁵ From that travelogue we can glean much related to her political, theological and literary opinions, and her pragmatic, positive approach to everyday situations. Throughout, her arguments and observations are strong but liberal and balanced. Her spiritual bias is always present, but completely non-denominational. She never hesitates to point out where she believes other authors are users of 'long words and short logic.'⁵⁶

Elizabeth Carne was two years older than Caroline Fox and lived two years longer, though both died in their fifties in the early half of the 1870s. Their fathers – Robert Were Fox FRS an inventor⁵⁷ and Joseph Carne FRS a mining engineer – clearly knew each other well before these two girls were born, and not least through founding membership in the new Geological Society in Penzance in 1814. It was common it seems, when attending meetings in Penzance, the Fox entourage would call in routinely for a meal in the Carne household. This was possibly the vehicle through which the two prominent women, Caroline Fox and Elizabeth Carne, came to be such close friends and corresponding social commentators.

It is to Anna Maria Fox, Caroline's older sister, that we owe the idea and formation with her family of the Royal Cornwall Polytechnic Society (RCPS) in the 1830s, and perhaps to Caroline that the choice of 'polytechnic' as a name was devised, based on the French model. It was and remains a broad-based society to promote ideas and inventions in the arts and sciences, devised in its beginnings as an educational and inspirational support for the mining

53 The Sedgwick Museum of Earth Sciences is the repository of the Carne mineral collection, which Elizabeth Carne originally offered to the RGSC. When her offer was rejected, she set about constructing her own family museum for the collection near the present-day Morrab Library (Coulson Terrace).

54 The British Association for the Advancement of Science, now entitled the British Science Association, was founded in York on 27 September 1831, the Editor of the *Edinburgh Journal of Science*, David Brewster FRS, being its prime initiator. 'Caroline was one of the women who was determined that the BAAS would open its doors to them [women].' See *The Scientific Lady, A Social History of Woman's Scientific Interests 1520-1918*.

55 Summarised following.

56 *Three months' rest at Pau* p83, about Charles Beecher and his *Spiritual Manifestations*, and p107-8 disapproving vehemently on Miss Martineau's stance in objecting to religious instruction of slaves in her *Society in America* (1837), calling Martineau's sophistries as 'base!'

57 Robert Were Fox Jr (1789-1877, FRS 1848); Fox was privately educated at home, a shipping agent with his father, a Quaker, and was much influenced by Humphry Davy (FRS 1803) and John Dalton (FRS 1822). He was also a friend of Davies Giddy, appreciating the work he did in parliament to support Cornish mining interests. [Archives of the Royal Society]

community around the Perran Foundry, which was owned and managed by the Fox family. Exhibitions and monetary prizes were awarded in the arts and the applied technologies, especially related to mining.

Elizabeth Carne and her own older sister, also named Caroline, both became subscribing members of 'the Poly' toward the end of their father's life, though Joseph Carne had been a Committee member of it since the beginning and latterly a Vic-President. All of these women exhibited deep interest in scientific experimentation and belonged through family affiliation to institutions promoting the sciences and the arts. Quite aside from formal organisations and groups however, experimentation and learning came directly and spontaneously into their homes, grabbing their attention.

June 13, 1851 – from Caroline Fox's *Journal*, Vol 2, p172

[In London] 'We went to Faraday's lecture on "Ozone". He tried the various methods of making Ozone which Schonbein⁵⁸ has already performed in our kitchen, and he did them brilliantly...he spoke much and well of Schonbein, who now doubts whether Ozone is an element and is disposed to view it simply as a condition of oxygen, in which Faraday evidently agrees with him.'

November 16, 1855 – Letter to E T Carne, Vol 2, p239

[At Penjerrick] 'Papa has been busy making bottled compasses for Brunel's great ship, who begged him to get at some magnetic results for him but Papa must experiment in the neighbourhood of much larger masses of iron than he can scrape together here. One thing, however, he has made out, that a needle suspended in water becomes quiet in its true position wonderfully sooner than when, as usual, hung in air – hence bottled compasses.'

In the same letter Caroline comments on something⁵⁹ Elizabeth has written:

"Oh! I do like what thou says about division of labour, and qualified people taking the simple generalship in all departments, and choosing their Colonels, Adjutants, and Sergeants, instead of doing the privates' work themselves, though doubtless they ought to be capable of that too." *Journal* Vol II, 241

'Take thy new existence, child of clay!'⁶⁰

Finally I come to her writings...but this remains a difficult task, even with the help of several friends. I am still chasing some of the earliest now – mainly the articles said to have been written by her anonymously in the *Quarterly Review* edited at the time by John Gibson Lockhart⁶¹ (from March 1826 – June 1853. Vol. 33, Number 66 – Vol. 93, Number 185) and Whitwell Elwin (from September 1853 – July 1860. Vol. 93, Number 186 – Vol. 108, Number 215). Mostly these are said to be about poverty, employment legislation and political reform, and written in letter format. As yet they have not been found and reviewed for content, as neither a pseudonym nor dates have been identified.

It was not until her father's death that the public persona of 'Miss Elizabeth Carne' began to emerge from under the umbrella of her illustrious parent. This was not unlike the metamorphosis of John Stuart Mill when his own father died some 22 years earlier.⁶² Since her teen years when her mother died, Elizabeth had assisted her father with the family estates and the domestic front with her sister. She now became the managing partner of the family

58 Schonbein, Christian Friedrich (1790-1868), chemist, born at Metzingen, Swabia and died at Sauersberg, near Baden Baden. After studying at Tübingen and Erlangen, he taught chemistry and physics, first at Keilhau, Thuringia, and then at Epsom, England, but most of his life was spent at Basel, where he held the chair of chemistry and physics (1828-1835). His name is chiefly connected with ozone, which he began to investigate in 1839, and with gun cotton as a propellant in firearms. He was a most prolific writer and carried on a large correspondence with other men of science, such as Berzelius, Faraday, Liebig and Wöhler. [*Encyclopaedia Britannica* 1911]. He was a member of the Royal Society of Edinburgh.

59 Reference unknown. Perhaps this was one of the *Quarterly Review* articles.

60 Final line of Elizabeth's poem, 'Enjoyment' published in *Three Months' Rest at Pau* following the death of her father one month before.

61 The son-in-law of Sir Walter Scott, and his famed biographer [*The Life of Sir Walter Scott*, firstly in 7 vols 1837-8, secondly in 10 vols, 1839]

62 Eugene August (1975) *John Stuart Mill, A Mind at Large* 74-5

bank and simultaneously received a two-pronged legacy: her father's mineral collection to catalogue, house and develop, and a large family fortune. Now she was to prove her mettle as a major contributor and thinker in the intellectual and scientific communities of interest nationally, and a shining beacon in the history of general education for the poor and disadvantaged locally.

Her commentaries on the thinking of similar polymaths such as Humboldt⁶³, Mill⁶⁴, Buckle, Southey⁶⁵ and others show her remarkable powers as a discussant and essayist. The only difference in the discourse was the nature of the messenger: Elizabeth was a woman, though in her vocabulary, her depth of learning and choice of topics, this is not immediately obvious. The chapters in her two main philosophical works reveal wide reading in both scientific and philosophical subjects and a desire to contribute to national debates.

Her chapters can stand individually as essays or articles, like those of Mill, and later those of Bertrand Russell in his study of human knowledge.⁶⁶ For example, her writings on the urban-country divide⁶⁷ are not out of place currently, and are one illustration only of how perceptive were some of her observations.⁶⁸ Today one might ask 'so what is new?' (after some 140-150 years), but that question is only possible due to the early analysts who began with telling observations, in the then new reaches of the social sciences and economics. Though short extracts cannot comprehend the full impact of her theses, I submit the following as a start. It sounds familiar.

'In England, at present, large proprietors are continually buying up smaller ones, and large capitalists beating smaller ones out of the market, producing an ever-increasing separation between the few extremely rich and the many extremely poor. Nationally speaking, the prosperity of the overgrown few is bought by the degradation of the stunted many... We may say just the same of a great city. Efficient as city life is in stimulating special gifts, it is wanting in many things that conduce to health and growth, both of body and mind... National inequality is implied in the multiplication of great cities as much as in that of great estates...'

Elizabeth's first book-length publication was prepared over the year following Joseph's death.

Three Months Rest at Pau in the Winter and Spring of 1859 [published 1860]

"From the north-land, from its hours of sadness,
Sent by hope, I come across the sea;
Summer, summer, bring the buoyant gladness,

63 Two brothers whose work would have been read by Elizabeth are named Humboldt. On this subject it would have been the writings of the first of these to which she refers: Wilhelm von Humboldt (1767 – 1835) was a Prussian philosopher, and founder of the University of Berlin, which was named after him (and his brother, naturalist Alexander von Humboldt) in 1949. He is especially remembered as a linguist who made important contributions to the philosophy of language and to the theory and practice of education. Alexander von Humboldt (1769 – 1859) Geographer, naturalist and explorer. Alexander Humboldt's quantitative work on botanical geography laid the foundation for the field of bio_geography. Between 1799 and 1804, Humboldt traveled extensively in Latin America, exploring and describing it for the first time from a modern scientific point of view. [Details from *Wikipedia*, accessed 7 January 2014]

64 John Stuart Mill (1806-1873) Political economist and eclectic thinker, radical social reformer, and author of *'On Liberty'* (1859) and *'The Subjection of Women'* (1869) and other writings.

65 Robert Southey (1774-1843) was Poet Laureate from 1813 until his death, though his authorship of great figures such as *Nelson* (also 1813) and *John Wesley* (1820) and his history of Methodism were his greatest achievements. Living in Keswick, with the Coleridges at Greta Hall, he also contributed regularly to the *Quarterly Review* from its beginnings, a journal to which Elizabeth Carne also became an anonymous contributor.

66 Bertrand Russell (1948) *Human Knowledge, Its Scope and Limits*, especially part VI 'Postulates of Scientific Inference' and chapter XI 'Fact, Belief, Truth, and Knowledge'.

67 *Country Towns, and the Place They Fill in Modern Civilization* [by the author of 'Three Months Rest at Pau'] published in 1868.

68 *Royal Society of Arts Journal*, 21st century enlightenment Jnl Issue 3 2013: 'The power of cities' Series of articles on the future of metropolitan living, urbanization and 'thinking local', including a paper on Plymouth as a social enterprise city in the first wave. Hannah Devlin, Science Editor, 'Planners take note: green spaces perk up urban dwellers' reporting on Exeter University study published in *Environmental Science & Technology, Times*, Tuesday, 7 January 2014

Bring the smiles that come with health and thee.”⁶⁹

‘John Altrayd Wittitterly’ (JAW)⁷⁰ was the chosen pseudonym of Elizabeth in the guise of an Englishman and gentleman-scientist requiring recuperation. What the reader is not told in reading this delightful collection of botanical, geo-political, cultural, dietary, and literary anecdotes is the reason for the ‘hours of sadness’ that has driven the travellers abroad. Joseph Carne had died in October, 1858, a month before, following long months of illness [bronchitis] nursed by his daughters, Elizabeth and Caroline. The writer and his companions are now ‘resting’ with family friends in the English community long established at Pau, France.

On the title page Elizabeth explains obliquely the purpose of the book: “Mrs Wittitterly forms and expresses an immense variety of opinions on an immense variety of subjects.”⁷¹ The traveller requires recuperation and splits ‘his’ chatty and often humorous narrative into entries that cover three months into five chapters: one chapter each on the business of getting there [diet and transport] and the return journey from London to Folkestone and across the Channel, and then three in-between on ‘rest’, ‘enjoyment’ and ‘advice’.

In essence the book is a cross-cultural study of vegetation, rock formations and architectural features as well as the English characters who regularly wintered there and the customs and traditions of the locals. Her discourses include the topic of primogeniture and its effects in inheritance patterns which she compares with those of the French. She discusses the rights and wrongs and pitfalls of almsgiving. She expatiates on men’s beards, moustaches and other bits of facial hair. She explains the comparative niceties of social calling, and the leaving of visiting cards in the foreign community. And not least she inter-splices her social subjects with geological observations, which she lightly calls ‘geologizing’, all of this and more in the guise of a man.

‘With regard to the geology of this district, I have a theory that the rise of the granite range caused the rift through which the river now runs, and by so doing, drained the lake of Arrens - that previously the terraces now hanging above the river formed the bottom of a much wider valley, or perhaps a plain - on one side of which the granite rose - that the granite probably carried up some of the slate with it, over and among which lie granite rocks and debris...’ She proceeds to list in detail the ‘Proofs needed to support this theory...’ [pp 211-2] And she concludes this section with ‘Another little theory - I am more fully confirmed in my belief that the crystalline yellow-brown limestone, so common in the shingle of the river-courses is a decomposed and re-organized stone. And she proceeds to offer proofs in all stages... followed by, ‘Query, whether pink and red shales may not become pink and red limestone, when infiltrated by lime-water under certain conditions: the aluminous particles gradually disappearing, and calcareous ones being deposited in their place?’

Three months’ rest at Pau is a fascinating compilation, proving a wry and utterly clever sense of humour, as well as revealing the close observations of human nature and scientific interest, for which she is praised in all of her memorials. If brought together with the volumes of sketchbooks in the Cornwall Records Office, a most beautiful and interesting illustrated travelogue would emerge. Her sketchbooks, carefully dated, show that the Carnes travelled often to London and to the continent between the 1830s and 1870s and this visit to Pau was not their first. The hills, plains and valleys and the snowy range of the distant Pyrenees are the subjects that she draws and paints in her lovely volumes of sketches and watercolours. Also from these visits came her first scientific paper for the RGSC.⁷²

69 First verse of ten in the poem ‘Enjoyment’. which finishes ‘Take thy new existence, child of clay’ Chap III 160-1.

70 Mr and Mrs Wittitterly are Dickens’s characters in *Nicholas Nickleby*. It is Mrs W. that does all the ‘jawing’.

71 Today it is issued in on-demand reprint via the British Library series of books in the section labelled ‘History of Travel’.

72 ‘Enquiry into the Age of that part of the District of the Maritime Alps which surrounds Mentone’ [See bibliography]

Country Towns, and the Place They Fill in Modern Civilization [published 1868]

Though she lives and works in a 'country town', this is not a book aimed at local personalities or particular situations that we could identify in other history books.

Part I: The connection of Country Towns with Certain Elements of Civilization, 3 chapters and an Interlude chapter.

Part II: The Advantages of Country Towns, in 7 chapters, being Health, Development of Character, Education, Manners and Habits, Charities and Amenities, Public Spirit and The Advantages and Disadvantages of Country Towns in Self-Culture.

Written ten years after her travelogue, *Country Towns* was her first serious study of social conditions she observed in Britain. It is a work raising national and cultural concerns about such topics as over-crowded slums, the health hazards of poor drainage and foul air/pollution, and the advantages to the public welfare of integrated schooling for boys and girls together. She outlines the inequalities that are generated through private schooling and also the then widespread practice of educating children, especially girls, at home. She was a strong opponent of the rigid social class structure which should be deconstructed by education and justice. Virtually every issue that she raises throughout this interesting ecological treatise, remains topical to the present day, and perhaps more so as the practice of home-working through the internet, becomes wide-spread.

'Many think of improving themselves by the study of a new language, or a new science; and doubtless these things will improve us in the mental exercise they promote, but, they are more acquisition than cultivation. We should rather seek to cultivate general intelligence and breadth of sympathy, both of the head and heart; a taste for beauty, a thirst for knowledge, a keen interest in discoveries, improvements, social questions, politics, everything that belongs to the world of nature and the world of man. It is this for which country towns afford us ample means...And we are inexcusable if we allow the mental inertness of country-town life to beset us.' [*Country Towns*, p190]

England's Three Wants

Caroline Fox's final letter was to Elizabeth Carne, thanking her for an earnest pamphlet and wishing her the best for the new-born year of 1871. This pamphlet was undoubtedly the political and religious tract, published anonymously by William MacIntosh of London, entitled *England's Three Wants*, which Elizabeth may have first delivered as a sermon or lecture in London. It was firmly rooted in textual references to Revelations xxii.17 and Ezekiel xlvii.2-5 and concentrated on the hidden poverty of rural communities, the lack of enthusiasm for spiritual learning and the failure of the churches, despite their accepted responsibilities for the moral fibre of the nation, to fill the gaps. She postulates a nation with a lack of thirst for the 'water of life' (God), the lack of education and curiosity, and finally the ineptitude and unwillingness of the church to minister properly. This was possibly delivered in a London lecture series, but the actual location is not identified.

The Realm of Truth (1873)

When Elizabeth presented a copy of this book to the Rev Philip Hedgeland, Vicar of St Mary's Parish, her accompanying letter stated "My latest and I think also my last book. It has been simmering in my mind all my life, and I am thankful to have lived to see it take a definite form." Her letter was dated June 5th, 1873, and three months later she was dead.

In this final volume, which Elizabeth submits with her full name on the title page, she seeks to sum up her philosophy of life, to connect this with the world in which she travelled and lived and to argue closely why she reasons so.

She begins easily in her Preface,

'The nature of the subject should have banished the idea of originality; for when we offer Truth to others, we offer that which is not new, but very old. The whole aim of the book is to bring together

truths, which separately have been long known and acknowledged, for the purpose of showing that all truth is one...

'...I feel it would be a great step gained, if I could place before the reader at the beginning of the book, the idea which has become more and more clear to me in the course of writing it – that Truth is that which is, that which exists by its own inherent nature; and that reception of it should be less as something to see and know, than as something to be.' [Preface, vi]

Her objectives were to share ways in which the natural laws of 'living wisely and not wastefully' (economies of choice) can be gained for all through a theologically-sound understanding of the 'supreme being' [God] as the originator of truth (what *is*), and as the ground of trust. In today's world this kind of exploration on the part of an author puts the result outside the realm of scientific study, but such a personal and moral statement lies for Elizabeth as the platform for all human interaction with our world, and contains the moral imperative to *study* that world, reveal its secrets, and change it to the good. Rather than being 'long on words, and short on logic'⁷³ she was the direct opposite. The task she set herself was the same as outlined in the essay published by Bertrand Russell (1872-1970) in *Human Knowledge, Its Scope and Limits*.⁷⁴ She begins with the sources of family life and schooling and how through parental influence and teaching environments, 'the twig is bent' and truths are moderated through the trials and expectations of others in schooling and working life.

The outcomes, however, of their overlapping conceptual work are different, Russell's rooted in theories of truth and knowledge and in linguistic meanings, hers in theologically-centred social benefit and action. Her concerns are aimed at sorting knotty, practical problems of housing, health, transport and distance, self-reliance and occupation, responsibilities of employers to employees, and division of labour. To this end were her prodigious efforts in building and establishing schools, in initiating care for the elderly, and self-help projects for the poor.

The much-respected Rev Prebendary Hedgeland in preaching Elizabeth's funeral sermon⁷⁵, selected a passage from *The Realm of Truth* in order to explain her attitude toward religion: *'We are accustomed to think that God has revealed His truth in the Bible, and so He has; but it may well be questioned whether, for all practical results, Eternal Truth is not less enshrined in the words of a Book than in the lives of those who profess to find it there...'*

One last anecdote, as reported in her magnificent memorial tribute in the *Cornish Telegraph* of 1873, serves to remind us of the very practical nature of her thinking: *'With all her dislike to pauperism, one scheme which some people say helps to induce it, was a favourite with Miss Elizabeth Carne. That lady would have had the memorial of Sir Humphry Davy⁷⁶ take the form of almshouses for the decayed or drooping inhabitants of the great for whom it is a native town, and she offered land and £1000 towards the benevolent project.'* One wonders who the 'some' were who opposed it, and what Humphry Davy himself might have thought about that bright idea? As we know, the statue won through.

Conclusions

Recognition and review of the content of Elizabeth Carne's literary and scientific work is long overdue. Though a small number of connections in her distinguished social circle have been made, these are only partially explored and based primarily upon the references made in her writings. By placing her published work in the context of her own time, a woman of

⁷³ See Footnote 57.

⁷⁴ Bertrand Russell (1948) Chapter XI, 'Fact, Belief, Truth, and Knowledge' pp159-176

⁷⁵ Sermon. "Being Dead Yet Speaketh" Heb. Xi.4: In Memorium. Elizabeth C T Carne Entered into Her Rest Sunday Evening, September 7, 1873. 15pp With thanks to Andrew Symons for locating this in the Hedgeland Papers, lodged at the Morrab Library.

⁷⁶ This statue was erected in 1872 and was produced by the sculptors Wills of London and is of white marble. It stands in front of Market House, at the top of Market Jew Street, Penzance.

outstanding integrity, sensitivity, and learning is revealed, certainly the equivalent of those termed 'gentleman-scientists' honoured in the 19th-century.

Working against our acknowledgement of her achievements is the emblematic silence surrounding virtually all women's past contributions to the sciences and literature. In her life-time it remained politically and culturally appropriate to write for journals anonymously, or under a well-concealed pseudonym. Her writings and drawings found to date are of greatest importance in bringing to light the need for much greater scrutiny and digital record of historic documents in general, and women's work in particular. Without this research, we continue to stand squarely in pseudo-history, and to ignore the often false premises upon which we build our studies of the past.

The quality of her geological studies was judged important in her own time, though as an interested non-specialist, my observations are inadequate in judgement of it. Undoubtedly she learned from her father, she assisted him, and she added to his work and collection. As a caretaker, a recorder and as a dedicated student of earth sciences, she was highly respected, not unlike Hypatia. All of these are critical to the future of knowledge, and in all of these she excelled. Her 'credits' in this field are for modern-day geologists to investigate and make known.

This paper urges that close attention should be given to ideas she relates, to alarms she raises and to the exemplar she became. Elizabeth Carne's spiritual leadership was grounded in an empathetic understanding of the dangers to society and community that ignorance, inequality and poverty sustain. The potential ups and downs and balance between knowledge and social action, between freedoms and restraints, between people and their natural and built environment, was the discussion into which Elizabeth Carne threw her thinking cap. In this sense, and though the term was not yet in use in her time, she was a leading midwife to the field of science we now call 'human ecology', if not its mother. This must be pursued.

Appendix 1

Bibliography of Carne, Elizabeth Catherine Thomas (1817-1873)

(also wrote under the name of John Altrayd Wittitterly)

Subjects: Geology, landforms, travel, religion, economy, society, philanthropy, poetry (no fiction)

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Letters and Reminiscences of Emily Bolitho (1817-1886) Two long letters from ETC to EB, one from Penzance (1843), one from Switzerland (1844) Penzance: Beare & Son

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'On the Transition and Metamorphosis of rocks' [published posthumously 1875]

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Journals of John Stuart Mill: entries related to Carne family of Lands End, 1832 - 'Walking tour of West Cornwall'

Memories of Old Friends, being extracts from the journals and letters of Caroline Fox (1835-1871)

Letters to Elizabeth Carne from C Fox (22 referenced pages, some containing more than 1 letter) (no replies), generally on topics of their reading, and their travels and impressions of family, friends and visitors. Third edition: to which are added 14 original letters from J S Mill to Barclay Fox never before published. London: Smith, Elder & Co

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Appendix 2: The Carne family of West Cornwall

William Carne⁷⁷ of Gwinear (1754-1836) m **Anna Cock** (d 1822) of Helston in 1780

V

Children of William & Anna:

Joseph Carne (1782-1858) FRS of Penzance m **Mary Thomas** of Glamorgan in 1808

William Carne Jr (1787-1861) m Eliza Johanna James

John Carne (1789-1844) author, m Ellen Lane

Rev James Carne DD (1794-1832) m Charlotte Smith

V

Children of Joseph & Mary:

Joseph Thomas Carne (1809-1831) of Phillack

Mary Carne (1811-1890) m Dr Archibald Colquhoun Ross of Lanark (8 children)

Anna Carne (1813-1887) m Dr David Johnston of Edinburgh & Bath (no issue)

⁷⁷ A first cousin of Ann Carne Branwell (1745-1809); they shared a great-grandfather. They lived across Chapel Street from each other, on two sides of St Mary's Chapel. Ann Carne Branwell was the maternal grandmother of the Brontë children of Haworth, her daughters being Maria (the Brontë mother) and Elizabeth (the aunt who became their step-parent). Joseph and his brothers would have known the Branwell children well, growing up locally and attending Methodist class meetings.

Elizabeth Carne I (1814-1818) of Phillack
Caroline Carne (1815-1900) of Phillack & Penzance
William Thomas Carne (1816-1852) of Phillack m Frances Cornish (1 child
Frances II Cornish, dgt. m Thomas Polwhele of Polwhele, Truro)
Elizabeth Catherine Thomas Carne (1817-1873) of Phillack & Penzance
George Thomas Carne (1821-1822) of Penzance

Acknowledgements

Sincere thanks are offered to the RGSC for providing this opportunity to explore and re-introduce the life and work of a Cornish-born woman of science and her circle. More will follow. A generous grant from the Brontë Society of Haworth, Yorkshire,⁷⁸ has enabled me to concentrate time and fund the acquisition of documentary resources related to the Carne family of Penzance, in parallel to research on the Branwell family, their close relatives by marriage. All of these were maternal relations of the Brontë writers of Haworth, Yorkshire. In this sense, my intention has been to investigate potential roots of influence shared between them.

The Hon Publications Officer, Sarah Fermi, of the Brontë Society, has been of invaluable assistance in acting as an on-site researcher at Cambridge University and its Sedgwick Museum, and as a dedicated reader of progressive drafts of this paper. The Carne Mineral Collection, collated by Elizabeth Carne, is lodged in the Sedgwick Museum of Earth Sciences in perpetuity. At the Sedgwick, I am indebted for the help of palaeontologist and science writer Douglas Palmer and archivist, Sandra Marsh. These three have enthusiastically taken up the search for supporting documents, and uncovered some curious twists in the tale of how the Carne Collection found its home there, and who was instrumental in achieving it. This subject will be explored in a future paper and is an interesting story reflecting regional and national perspectives on the values of collecting specimens and their placement.

For lodging and creature comforts in Cambridge (summer, 2013) I am grateful for the generosity of my step-son, Professor Philip Hardie and his wife Susan, and the welcoming 'arms' of Trinity College, where several of our illustrious Cornishmen and RGSC members have 'read' before, including Joseph Carne Jr, (1809-1831) one of the two elder brothers of Elizabeth Carne, both of whom pre-deceased her. I am myself related by marriage to the Joseph Carne FRS family through his son William Thomas Carne; his daughter, Frances Cornish Carne Polwhele is an ancestor of mine.

At the Morrab Library in Penzance, I have to thank several archivists and helpers, including John Simmonds, Margaret 'Meg' S Brown, Katie Lennon, Annabelle Reid, Tom Goskar and Jenny Pozzi. A previous archivist of the Hypatia Trust, Andrew Symons, author and researcher, could not have been more generous with time and discussion. Equally, the team at the Cornish Records Office have been consistently helpful when visiting with my scribe Helen Gibson. Correspondence with Mrs Catherine Smith, Archivist of Charterhouse School proved unexpectedly fruitful, and introduced connections most surprising. Little would have been possible in these later years of research and writing without the loyal support and encouragement of my partner in life, Philip Budden. To him I owe the *soft landing* achieved in coming to Cornwall, and curiously and unexpectedly finding my own paternal grandmother's family roots.

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⁷⁸ The Daphne Carrick Memorial Scholarship, 2013-14

