



The Linnean



Carl Linnaeus
1707–1778

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Editorial

There will be two issues of *The Linnean* this year: one in March and the second in September. This, the March issue, contains three articles, one zoological and one botanical and one about geology. The botanical article is, in essence, a biography of one of Linnaeus' favourite apostles, Peter Forskål. Peter, together with five comrades, started out from Copenhagen, reaching northern Yemen two years later. However, less than six months later Forskål and three other members of the expedition had died, Forskål on July 11th 1763. The sole survivor was the cartographer Carston Niebuhr who returned Forskål's specimens and field notes to Linnaeus.

The zoological article concerns the use of thorns and spines as pins in an eighteenth century insect collection belonging to William Hunter. This collection was eventually bequeathed to the University of Glasgow where today it is in the Hunterian Museum. The authors point out that part of the collection contains insects pinned with *Pereskia* spines. Thus it would appear that plant spines were resorted to in the field when metal pins were in short supply. Elsewhere in Hunter's collection from the West Indies, spines from the prickly pear cactus *Opuntia* sp. have been used to secure specimens!

The geological paper deals with Alfred Russel Wallace's views on anthropology and, in particular, the eolithic controversy. Wallace began corresponding with Benjamin Harrison around 1887 and, like him, came to believe that pre-glacial eoliths, in particular those from Kent, were fashioned by man. Thus Wallace believed that eoliths were small flints whose natural shape had been slightly altered by man, to make them more useful tools. Interestingly, we come across the first reference to a hoax when Oakley (1960) was able to show, using fluorine analysis, that what Wallace took to be an American 'eolithic' skull (the Calaveras skull) was a fraud. Note that using similar techniques Oakley (in Weiner *et al*, 1953) had already shown Piltdown Man to be an elaborate hoax. Finally, we come to eoliths themselves. Today many scientists believe that they are no more than the result of natural causes, from the pressure and movement of one flint upon another during the last ice age! Wallace's own collection of eoliths was donated to the Pitt-Rivers Museum, in Oxford.

BRIAN GARDINER

Editor

This year's Linnean cover

The images on the left of this year's cover are from drawings that belonged to Linnaeus and came to London with everything else when James Edward Smith bought his collection. The plant is an extract from a full page drawing by José Celestino Múti (1732-1808) of *Calceolaria perfoliata*, numbered 3 in a box of drawings by Múti labelled *Icones ineditae* (BL1178). The snake is *Coluber cerastes* L, or Horned Viper of Egypt, a line engraving of a drawing by John Ellis (1710?-1776) for his paper published in the *Philosophical Transactions of the Royal Society* 56, 1766 p. 287-290, pl. XIV. (N.B. it has been reversed left to right from the original.) In the Linnean

library it can be found in Linnean Portfolio “Ellis”. There are many more interesting drawings in the collection of Linnaeus’ papers so we shall look for different ones next year.

I am most grateful to Lynda Brooks for searching out these drawings for me and, as always, to John Stone (RGB, Kew) for putting them into his original design for the cover.

MARY MORRIS

Society News

Did you know that 2011 is the International Year of Forests? Following hot on the heels of the International Year of Biodiversity (2010), the United Nations has designated 2011 as a year for focusing on the sustainable management of the world’s forests. In recent weeks, I’ve been reading with interest as a consultation was announced on “The future of the public forest estate” with the Government proposing to “sell-off” the 18% of forests in England that are currently owned by the Forestry Commission. These plans have caused such an outcry from organizations and members of the general public that the consultation has now been halted and an independent panel of experts is to be established to consider forestry policy. Also on my reading list is the Royal Society of Chemistry’s response to the announcement of the closure of the Pfizer Research facility in Kent with the resultant loss of jobs; such significant cuts are somewhat ironic in what is also the International Year of Chemistry. As a Society we receive regular invitations to respond to consultations; some of these concern very specific fields of science, others are more broad-based encompassing topics such as science education. The involvement of the Society, and its Fellows, in such consultations is an important part of our role; it is important that we utilize our expertise and knowledge to influence policy and decision-making. I am always on the lookout for Fellows who would feel able to help the Society in responding to consultations that are relevant to their area of expertise. Please do contact me if you would feel able to help in this way.

Responding to consultations is just one way in which the Society is engaged with contemporary scientific issues. “Steeped in tradition; engaged in contemporary science” is a way the Society was recently described to me, and our recent and forthcoming meetings programmes reflect the Society’s bridging role between the past, present and future of the science of natural history. In the final few months of 2010 we welcomed speakers who helped us explore and learn from history. In October, John Pearson gave an excellent lecture celebrating the vision of Professor Francis Oliver, integral to the establishment of a Field Station at Blakeney Point, still in use 100 years later. In December Pilar san Pio Aladrén gave a superb insight into unravelling the links between natural history collections using her work with Charlie Jarvis on material by J.C Mutis from both the Society and in Madrid, whilst George McGavin presented a Review of the Year at a very-well attended Christmas lecture.

We also welcomed speakers who challenged us to think about our response in the future. Our Annual Darwin Lecture with the Royal Society of Medicine was held in

November and was given by Professor Sir Roy Anderson FRS. He spoke about past epidemics including H1N1 and challenged us to think about how the world's response to this form of influenza will influence response to epidemics in the future. In January, Professor Sir Mark Walport from the Wellcome Trust gave us his insightful perspective on what is needed to maintain the UK as a centre for excellence in STEM subjects – science, technology, engineering and mathematics. We were similarly challenged by Geoff Boxshall and Charles Godfray in October, as they presented some preliminary thoughts following the NERC Taxonomy and Systematics Review.

Fellows may remember that following the Society's own Taxonomy and Systematics Consultation, led by David Cutler, a small working group was established to discuss and prioritise the issues raised and determine appropriate actions. Council has agreed that this group should become a formal "Standing Committee" of the Society and the Taxonomy and Systematics Support Committee is now hard at work. It is essential that we continue to emphasise the importance of taxonomy and systematics and the current issues and priorities within these fields and David Cutler and I recently published an article in the Society of Biology's *Biologist* magazine.

We've also been looking to the future and the next generation with the production of our new Education Resources. We launched four A1 posters – Biodiversity, Conserving Biodiversity, Classification, and Evolution, and three workbooks based on classification and variation, designed to support teaching at Higher GCSE, AS and A2-level at the Association of Science Education Conference in Reading in January where we had a joint stand with the British Ecological Society, Royal Botanic Gardens, Kew and Science and Plants for Schools (SAPS). This was a "first" for the Society and many people commented both on how good it was to see the Society represented and on the wonderful resources. These are available for teachers or anyone else who is interested, to download from our website; please look out for further resources in the coming months.

As 2010 drew to a close we were delighted to welcome Tom Kennett to the staff within the Library and as I write, Helen Cowdy is starting her new role with us within the Conservation studio. We warmly welcome Tom and Helen to work on two very important projects which will increase access to the Society's resources – please see Lynda's library report below for more about their roles.

As much of this Society News has focused on looking forward, I look forward very much to seeing you at the Society in the future or to hearing from you about your ideas and involvement in the Society's future work.

RUTH TEMPLE
Executive Secretary

Library

As was reported in the last issue, funding has been secured to create an 18-month full-time post to enhance the catalogue records for the individual letters contained in the correspondence of our founder, Sir James Edward Smith. We were delighted to

welcome Tom Kennet to the Library team in November to take on this part of the project. Tom has had a great deal of experience in cataloguing various correspondence collections and comes to us from working in the Archives at Canterbury Cathedral.

The project to clean the Smith herbarium sheets ready for digitization has now been completed by our conservation team, Janet Ashdown and Lucy Gosnay. This is the culmination of six years' dedicated work in-house. However, Janet and Lucy will not be resting on their laurels (if you'll pardon the pun) as Janet will begin working on the 446 sheets of Smith's Miscellaneous Lichen Collection in preparation for their cataloging and digitizing and Lucy is embarking on a three year project, under Janet's supervision, to conserve the Smith correspondence. This latter project, funded by The Andrew W. Mellon Foundation, will entail disbinding each of the 26 volumes containing Smith's correspondence and carefully removing the letters from each page. The letters will then be cleaned, and repaired if necessary, before being hinged with Japanese paper and mounted into 16-page acid-free fascicules. An Assistant Conservator, Helen Cowdy, has been recruited to help with this project and she joined the team in February. Helen has been involved in a similar project to conserve and digitize the Directors' Correspondence at Kew and has also worked on conserving Marianne North's oil paintings on paper.

The Society has recently had requests from two institutions for the loan of material for exhibition and, on their submission of satisfactory environment and security questionnaires, Council was happy to approve the loans. Documents from the Society's Max Nicholson archive have been sent on loan to the Swiss National Museum in Zurich and the exhibition, *WWF: a biography*, runs there from 20 April to 28 August. The Society's portraits of Henry Seymer and Richard Pulteney are on display in the exhibition *Georgian Faces: portrait of a county* which opened at Dorset County Museum in Dorchester on 15 January and runs until 30 April.

From January to March the Library Reading Room hosted part of Plymouth City Museum and Art Gallery's touring exhibition *Sir John St Aubyn: the secret life of a collector*. St Aubyn (1758-1836) was a Fellow of the Linnean Society and, although his main interest was in mineralogy, he also created a herbarium. Our Society showcased the botanical part of the display whilst the Geological Society had the mineralogical exhibits.

Visits to the Society's collections have been organised for a variety of groups and individuals. The new intake of Scandinavian Studies students from University College London visited in October and their tutor hopes to make this tour of the Society a regular fixture for her new students. We also had visits from Greenwich University conservation students, the U3A and the English Gardening School (botanical art students). In December we displayed the Selborne Society deposit material for a group studying Gilbert White and a researcher from Japan will shortly be coming over to examine the Selborne Society minute books that we hold. We also welcomed several new Fellows wishing to view the Linnaean Collections as well as a Natural History Museum intern and a tour guide from the Linnaeus Museum in Uppsala.

LYNDA BROOKS

Librarian

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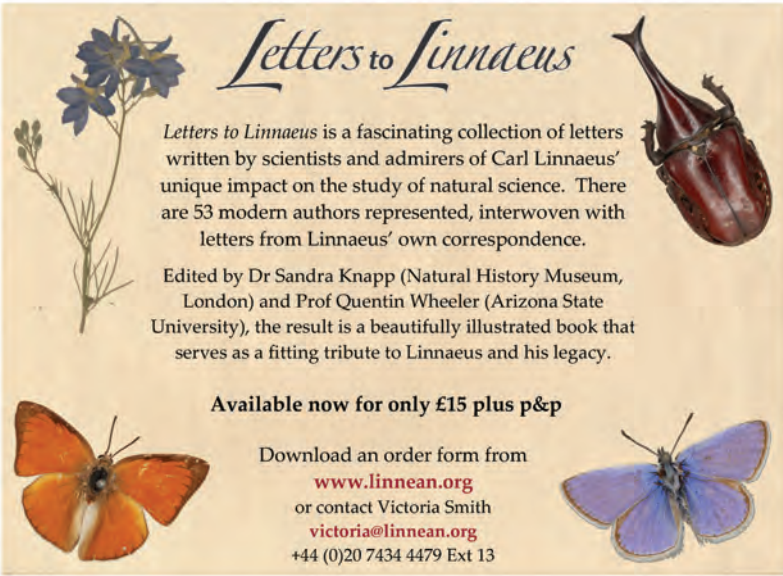
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Correspondence

From: David Jones MA, DPhil, CBiol, FSB, FLS david_jones@his-locker.net

I respect Patrick James admitting an error with his tasting experiment with PTC (PTU) and Fellows of the Linnean Society (letter, October 2010). Had he been an undergraduate in Cambridge when R.A. Fisher was Professor of Genetics, he would have experienced the design created by that master to test students' ability to taste PTC. Fisher had 26 dropping bottles in a row, each with a different concentration of sucrose, vinegar, quinine or PTC. Those with sugar, vinegar and quinine were randomly arranged, but those of PTC were in increasing order of concentration. Students were not told what was in any bottle, but were asked to record sweet, bitter, acid or no taste. Samples of the distilled water used to make up the solutions were also included in the experiment with some on one side so that the 'background' taste could be appreciated. Each student had a spoon. All started at the same end of the line of bottles, taking and tasting a few drops of solution in sequence. By these means a threshold of concentration was obtained for each person.

I have forgotten the distribution of the results, but remembered the principle of the design of the experiment.

From: Professor John Cloudsley-Thompson Hon FLS

10 Battishill Street
London N1 1TE

Dr David Lyall (1817-1895)

The biography of David Lyall by his descendent Dr Andrew Lyall (*The Linnean* July 2010 vol 26, No 2 pp 23-48) was one of the most interesting, well researched and illustrated that I have ever read. David Lyall's observations on the New Zealand Kakapo (*Strigops habroptilus*: *Psitta cifformes*) reminded me of the Kagu (*Rhynochetos jubatus*: Gruiformes) found only in the forested region of New Caledonia. There was a caged Kagu in the gardens of Nouvata Beach Hotel, Nouméa when my wife Anne and I stayed there in October 1987. Each night the flightless bird would wake us regularly at 01.00 h with its dog-like call. Although unrelated to the Kakapo, it would appear to be its ecological equivalent.

The use of thorns and spines as pins in an eighteenth century insect collection

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Introduction

Dr William Hunter (1718-1783) was a distinguished physician and anatomist and an avid collector of a wide range of objects of artistic and scientific interest, including a fine collection of over 7,600 insects. These were all housed in a purpose-built museum within his residential home at No.16, Great Windmill Street, London and eventually bequeathed to the University of Glasgow where, since 1807, they have formed the basis of the Hunterian Museum (Keppie, 2007). While researching Hunter's insect collection it was found that on rare occasions a thorn instead of a pin had been used to secure a specimen into the drawer. This observation prompted an investigation into the nature of several kinds of thorn that could be used in an entomological context and of testing their ability to secure insects.

Background

William Hunter was one of a number of collectors who possessed fine insect collections in eighteenth century England. They obtained their specimens by various means (see Douglas & Hancock, 2007; Brown & Hancock, 2008). Naturalists such as Dr John Fothergill (1712-80) and Dru Drury (1725-1803), amongst others, had extensive collecting networks overseas and compiled specific written instructions for what they wanted and supplied equipment to collectors. Explorers and commissioned collectors usually immersed more robust specimens in alcohol but would secure some insect specimens in the field with pins that were supplied for this purpose. For example, Dru Drury's letter to a Mr. James in New York states:¹

Sending box with 6 drawers being corked and papered. Also boxes of various sizes, a net and sticks, caterpillar boxes, pins and also some ground pepper to be sifted over the flies

and John Fothergill's letter to Humphry Marshall (1722-1801) in Pennsylvania:²

Except the rattlesnake I have scarce any of your reptiles, and but a few insects. Whatever of this kind may therefore be laid aside for me: the reptiles may be put together in a little common spirit, and the insects stuck through with a pin and fixed on the inside of a box made of soft wood.

Many of William Hunter's former medical students at his School of Anatomy travelled extensively after qualifying and collected for him. He acquired by bequest substantial parts of the collections of Fothergill and Thomas Pattinson Yeats (d. 1782). Hunter's cabinet includes specimens collected by these and other well known naturalists and explorers, such as Joseph Banks (1743-1810) from his voyages to Newfoundland and on Cook's first circumnavigational voyage. Francis Masson (1741-1805) and Henry Smeathman (1742-1786) were particularly active in Africa (Douglas & Hancock, 2007).

Why use plant spines?

Pin supplies sometimes ran out and so the collector had to resort to using a substitute of some sort. Dru Drury was not keen on the use of iron needles:³

I would not advise you by any means to use needles as the Chinese do. They soon become rusty and then are extremely disagreeable.

and when the pins in insects he received had broken he complained:⁴

I charge you never use any of those cussed small pins again, many of the insects were destroyed by the pins breaking, the salt water having made them rotten...I beseech you don't use any more of them.

Other emergencies occurred such as the occasion recounted in a letter Hunter received from a former pupil, William Wood in Philadelphia in 1779, to say that he was sending insect specimens collected from the West Indies ⁵

The insects are native of Grenada in the West Indies, they were dry'd hanging them up in the room, in doing this a great attention is required, for the number of small ants are incredible, they are so numerous as to crawl down the string with which the box is suspended (in which they are set to dry) and will destroy the largest insect in a nights time, if the box is not well secured by wrapping it round several times with folds of cloth, some of them dip'd in a strong solution of corrosive sublimate, [mercuric chloride] which they did not destroy, when exposed, but then the sublimate destroyed the pins with which they were pin'd down, and I found myself at last under the necessity of pinning them with the spikules of prickly pear, a shrub commonly known by that name in the West Indies. The boxes in which they are now in, are made of soft wood; those you was so obliging as to leave at my lodgings in Newman Street three or four years since when was a pupil with you were too thin, and I was oblig'd to get new ones: the insides sprinkled with corrosive sublimate to prevent small insects breeding in them.

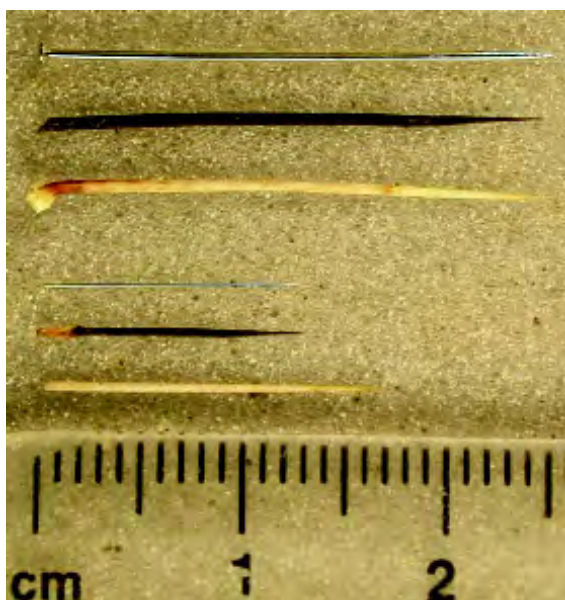


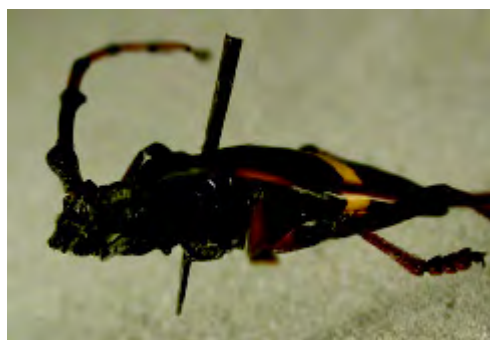
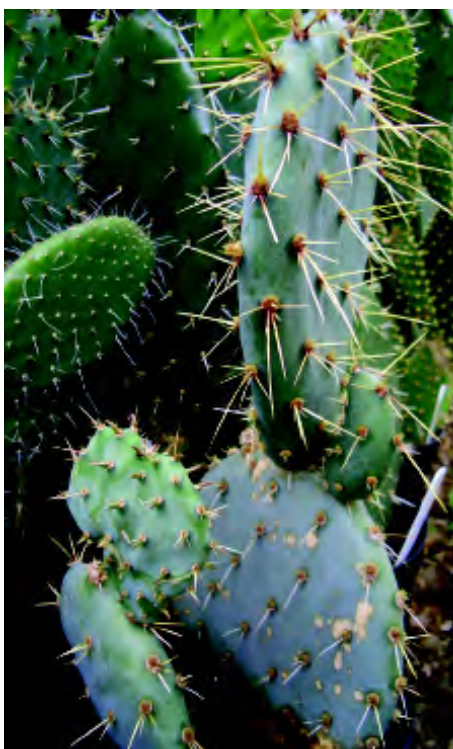
Figure 1. Some plant spines compared with modern entomological pins.

Thus it would seem that plant spines were resorted to in the field when metal pins had been destroyed or were not available. They lend themselves rather obviously to this purpose (Fig. 1) and are comparable on various scales. Anyone who has experienced physical contact with these plants will be aware of their sharpness and strength.

On inspection, none of the insects from the West Indies in Hunter's collection appear to have the spines of prickly pear cactus, *Opuntia* sp. (Fig. 2) securing them. This could be because they were replaced with metal entomological pins before being placed into Hunter's drawers. The brittle nature

Figure 2. *Opuntia* sp. growing in Glasgow Botanic Gardens, 2007.

of the tips of these spines, as revealed in the tests below, may have necessitated this. Those insects in Hunter's collection that have been secured with thorns are two species of cerambycid beetle (Figs. 3 & 4) from South America labelled 'Cer. Succinctus' (*Trachyderes succinctus* Linnaeus) and 'Cer. Scalaris' (*Taeniotes scalaris* Fabricius). Another of Hunter's specimens secured with the same type of thorn is a buthid scorpion (Fig. 5). The thorns are quite short, having been cut or broken off short, woody in appearance and successfully pierced both the specimens and the cork and paper lining of the drawer without breaking (Fig. 6).



Specimens from Hunter's collection secured with thorns: Figure 3 (left) *Trachyderes succinctus*; Figure 4 (right) *Taeniotes scalaris*; Figure 5, a scorpion (below).



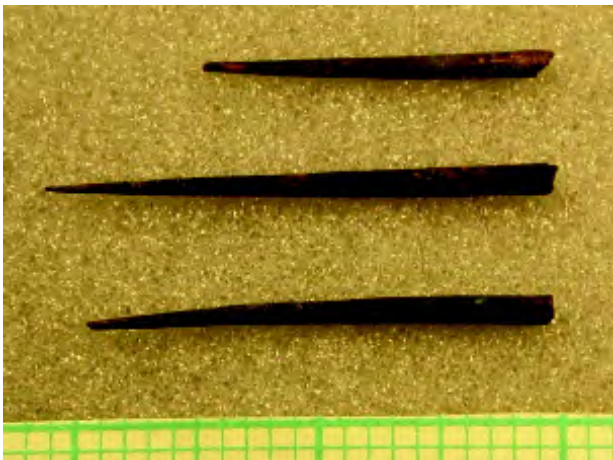
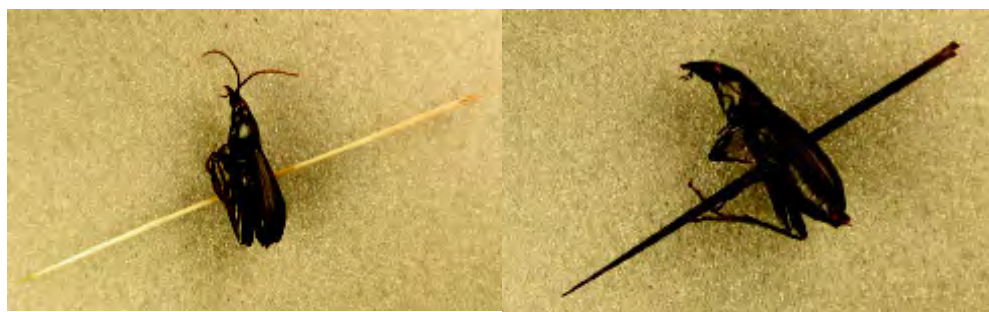


Figure 6. Close-up of the thorns from eighteenth century specimens from top to bottom, a buthid scorpion, *T. scalaris* and *T. succinctus*.

We obtained thorns and cactus spines of a number of New World plant species that have or might have been used as substitute entomological pins. From the Botanic Gardens in Glasgow we obtained two types of cactus, *Cereus* sp., native to Mexico and the USA and *Pereskia* sp., native to Central and South America. Spines from thorny palm, *Acrocomia aculeata*, were collected (EGH) in forest in northern Trinidad and prickly pear *Opuntia* sp. were collected (GVB) in central New Mexico, USA. They were tested for their ability to pierce through various dead insects, such as beetles, moths, and locusts, as well as penetrating paper of various thickness and the cork/ paper linings in one of Hunter’s original eighteenth century cabinet drawers. The results are shown in Table 1.

| Table 1. Results from testing the ability of modern plant spines to penetrate specimens and associated materials. | | | | |
|---|--------------------|---------------------|-------------------|---------------------------|
| Spine/thorn types | <i>Opuntia</i> sp. | <i>Pereskia</i> sp. | <i>Cereus</i> sp. | <i>Acrocomia aculeata</i> |
| Ability to pierce photocopy paper (80 gm wt) | Good | Good | Good | Good |
| Parchment paper (120 gm wt) | Good | Tip broke off | Good | Tip broke off |
| Beetle | Good | Good | Good | Good |
| Moth | Good | Good | Good | Good |
| Locust | Good | Good | Good | Good |
| Hunter papered and corked drawer | Tip broke off | Good | Good | Good |

Figures 7 to 10 show the four spine types pierced through small carabid beetles of the same size and species. None of them bent or broke in the process. It is interesting to note that the tips of *Opuntia* spines, a plant that was used in the West Indies by



Fresh carabid beetles experimentally pierced with spines from – Figure 7 (above) prickly pear cactus *Opuntia* sp. Figure 8 (top right) *Pereskia* sp. Figure 9 (below) *Cereus* sp. Figure 10 (right) the thorny palm *Acrocomia aculeata*.

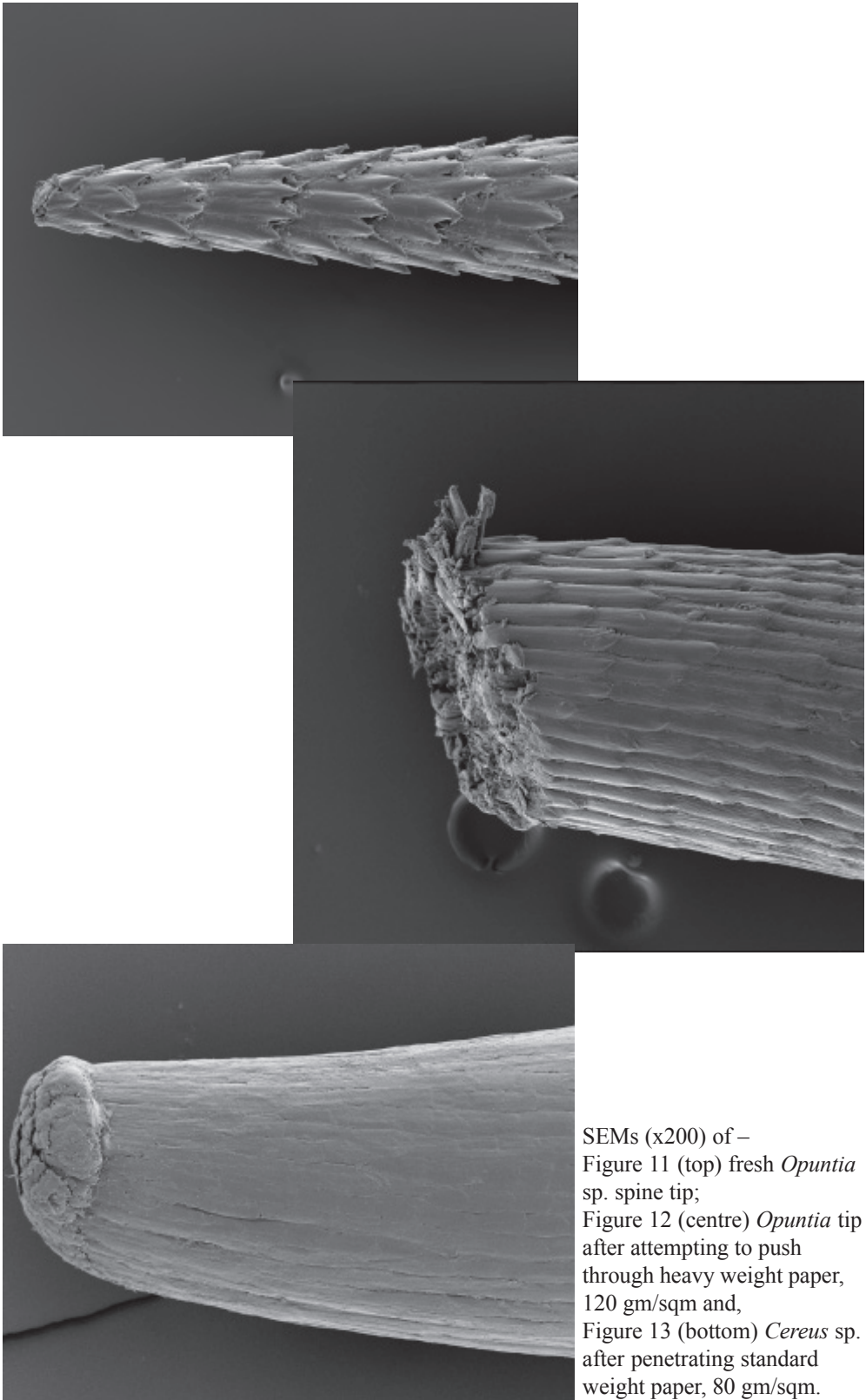


William Wood, although easily piercing all the insect specimens, broke when inserted into Hunter's cork and paper-lined drawer. This could be a reason for replacing them with metal pins and explain the apparent paucity of examples in the collection. Figure 11 shows a SEM image of the barbed tip of the prickly pear cactus, *Opuntia* sp. and Figure 12 of the same kind of spine which snapped during attempts to push through archive quality paper (120 gram/sqm). Figure 13 shows a *Cereus* sp. spine with the tip blunted after it had penetrated standard weight photocopy paper (80 gram/sqm).

A table of characters, using the spines tested, was created for comparison with the type of thorn found in Hunter's insects (Table 2). The original thorns in Hunter's collection, although the same as each other, do not quite correspond with any of those we tested. The plants from which they came remain unidentified.

Conclusion

Plant spines or thorns have had a number of uses over the past centuries, such as securing clothing, carding wool and closing the mouths of wool sacks. In Florida the honey locust tree, *Gleditsia triacanthos*, was sometimes called the "Confederate pin tree", because its spines were used to pin together the tattered uniforms of soldiers



| Table 2. Character table for plant spine morphology, modern and historical. | | | | | | | |
|---|--------------------|---------------------|-------------------|---------------------------|----------------|-------------------|-------------------|
| Spine characters | <i>Opuntia</i> sp. | <i>Pereskia</i> sp. | <i>Cereus</i> sp. | <i>Acrocomia aculeata</i> | scorpion thorn | Beetle No.1 thorn | Beetle No.2 thorn |
| Scales on tip | Yes | No | No | No | No | No | No |
| Translucent tip | Yes | Yes | Yes | No | No | No | No |
| Crooked tip | No | No | No | Yes | No | No | No |
| Ridges along shaft | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| Mottled shaft | No | Yes | No | Yes | Yes | Yes | Yes |
| Resinous spots | No | Yes | No | No | Yes | Yes | Yes |
| Variation in colour | No | No | Yes | No | No | No | No |
| Uniform pale colour | Yes | No | No | No | No | No | No |
| Uniform dark colour | No | Yes | No | Yes | Yes | Yes | Yes |
| Cross section | Oval | Flattened oval | Round | Oval | Oval | Oval | Oval |
| Flattens towards base | Yes | No | No | Yes | Yes | Yes | Yes |
| Flat on one side | No | No | No | Yes | No | No | No |

during the American Civil war (see Website). Collectors have successfully used thorns to pin insects collected when metal pins were not available. As well as the above examples there is anecdotal evidence for the use of *Acacia* spines in South Africa. In William Hunter's collection there are examples and documentary evidence for this practice dating from the eighteenth century.

Acknowledgements

This work is part of the Leverhulme Trust research funding (F/00 179/AA) into the historical and scientific context of William Hunter's eighteenth century insect collection. Paul Matthews kindly allowed us to sample cactus spines from the Glasgow Botanic Gardens collection. Margaret Mullin of the Integrated Microscopy Facility of

the Faculty of Biomedical and Life Sciences, University of Glasgow, was patient with our demands while using the scanning electron microscope. Thanks also to the Natural History Museum, London, General and Entomology libraries for access to Drury's archives.

Notes

1. Drury to James at Long Island. 19 Feb.1765. Dru Drury letterbook, Natural History Museum, London, p. 48.
2. Fothergill to Humphry Marshall, Pennsylvania, 2 March, 1767; quoted in Corner & Booth (1971) pp. 274-276.
3. Dru Drury to Mr. Hyde, "at China", 25 March 1768: DD letterbook, p. 137.
4. Dru Drury to Henry Smeathman "in Sierra Leone", 7 July, 1773: DD letterbook, p. 273.
5. William Wood to William Hunter, letter dated 29 Feb, 1779. Hunter correspondence, University of Glasgow Library, Special Collections, H.181. pp. 1521-1526. Wood, a former pupil of William's Anatomy School, was a surgeon in the second battalion of General How's army.

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The place of the eolithic controversy in the anthropology of Alfred Russel Wallace

Roy Ellen

University of Kent at Canterbury

The work of Alfred Russel Wallace (1823-1913: Fig.1) is justifiably well-known in relation to his contribution to the theory of evolution through natural selection, as is his general descriptive zoology. Less is known about his anthropological work,¹ though his accounts of the ethnography of the places he visited in his travels (e.g. Wallace, 1869, 1889) are still important sources for students of language and culture, while his work on human antiquity became a major interest in the latter part of his life. In this paper I shed some light on this part of his work, particularly as this is reflected in his interactions with other scientists and antiquarians concerning the so-called ‘the eolithic controversy’.

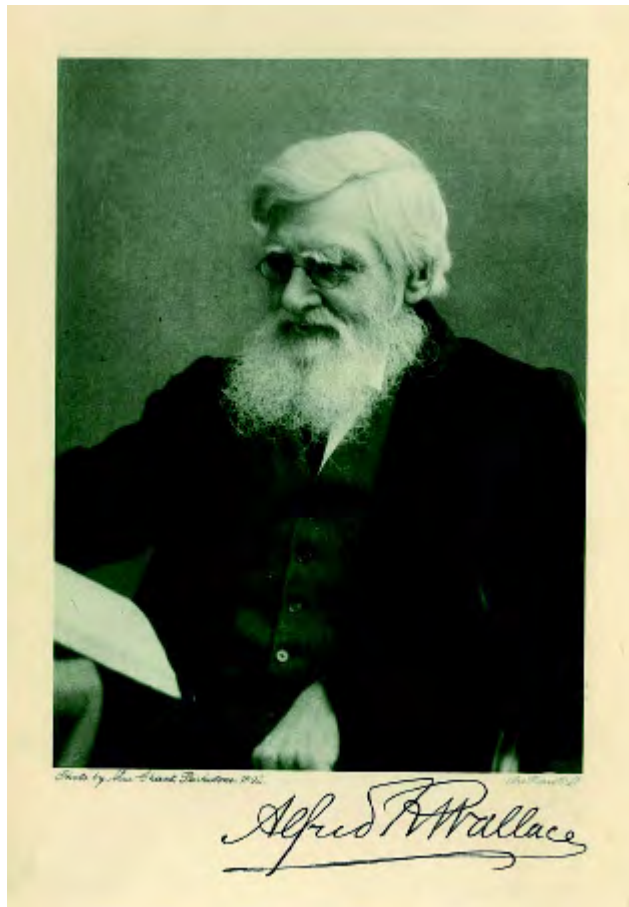


Figure 1. Alfred Russel Wallace, from the frontispiece to the first edition of *My life: a record of events and opinions*. This volume appeared in 1905, and so the portrait photograph would have been taken a bit before that, and certainly during the period when he was corresponding with Harrison and taking an interest in eoliths. Copyright: Linnean Society of London.

Almost as soon as it had been accepted by a core of influential scholars and scientists that flint objects found in deposits in Britain and France were not only the work of humans, but through their geological context were unquestionably of previously unimaginable antiquity, many among this same group, and others, became convinced that there must exist cruder implements in even earlier deposits. This ‘great and sudden revolution’ (Murchison, 1868: 486) was driven in part by the wider set of ideas associated with the publication of *On the Origin of Species* in 1859, the same year as the antiquity of the Somme and Brixham artifacts was confirmed. But it was also propelled by a logic that insisted that since the accepted artifacts, handaxes, were objects of considerable technical complexity, then they must have been the culmination of attempts by early humans to make simpler tools. Such tools, from deposits that were generally reckoned by geologists to be pre-glacial, and by archaeologists using the newly established terminology, to be pre-Palaeolithic, were termed by Gabriel de Mortillet (Mortillet, G. and A. de, 1881) ‘eoliths’. This term was widely accepted as a description of pre-Palaeolithic tools for approximately the next half-century. The first objects to be described in this way were from sites in France (Thenay, Puy Courney) and Portugal, though by the 1880s objects of a similar kind were being increasingly reported from lowland Britain, in particular from the Kentish Weald (Grayson, 1986: 81-91).

Given his own contribution to the formulation of the theory of natural selection, and his gracious and enthusiastic support for Darwin following the publication of the *Origin*, it is perhaps not surprising that Wallace early supported claims for human antiquity and progressive evolution. As early as 1864 he (Wallace, 1864) had fully accepted the archaeological evidence that humans had existed for 100,000 years, but could also see from the character of the evidence, and could infer from the gradualist logic of natural selection, that humans in some form could easily have been around for 1,000,000 years. The Quarternary geology and archaeology of the decades following the publication of the *Origin*, and the confirmation of the antiquity of the Somme and Brixham palaeoliths, were insufficiently robust to predict the geography of human fossil discoveries, so his argument for the extreme antiquity of humans also in the Americas (Wallace, 1887c) was certainly not perverse for the time (Grayson, 1983: 210). Indeed, the German anatomist Julian Kollmann (1884, 1898) had reached similar conclusions. However, by the early 1870s Wallace was beginning to distance himself from the orthodox Darwinian position on the application of the theory of natural selection to human evolution. In reviewing Darwin’s *On the Descent of Man* for the *Academy* in 1871, he repeated his views – much to Darwin’s despair – on why the laws of natural selection could not be extended to understanding the human brain, and by 1874, in his handling of affairs at the British Association for the Advancement of Science, there was evidence that his views on spiritualism were beginning to interfere with his professional judgments as president of the Biological Section (Raby, 2002: 203-9, 216-7).

As Wallace accepted the validity of human remains claiming to come from Miocene and Pliocene deposits in both Europe and North America, it was unsurprising that he should be predisposed to the eolith position. He appears to have encountered the work of the English eolithists in the mid-1880s as the first claims were being made for English (particularly Kentish) eoliths. The early finds of lower Palaeolithic tools on

the Kentish Plateau west of the river Medway by Benjamin Harrison (1837-1921: Fig. 2) were first reported at the meeting of the British Association for the Advancement of Science in 1885, and exhibited at the Royal Society in the same year, with the support of Sir John Lubbock (later Lord Avebury) and Sir Joseph Prestwich. Harrison, the village grocer in Ightham, a diffident autodidact and somewhat hard of hearing, had by this time already made important contributions to the Neolithic and Palaeolithic archaeology of West Kent, and although he did not become completely satisfied in his own mind as to the authenticity of the ‘ruder’ eolithic forms that he was finding on the Plateau until 1886 (Harrison, E., 1928: 133), he would devote most of the remainder of his life to the collection and understanding of eoliths as artifacts, and as a geological phenomenon.

Wallace is not reported as having been present at the early occasions when eoliths had their first public outings, but by 1887 (at the age of 64) he was corresponding with Harrison, and continued to do so for over 20 years (e.g. Fig. 3), and not only on human antiquity². Harrison wrote to Wallace on reading his ‘The antiquity of man in north America’ in November of that year, an article that had been published in the magazine

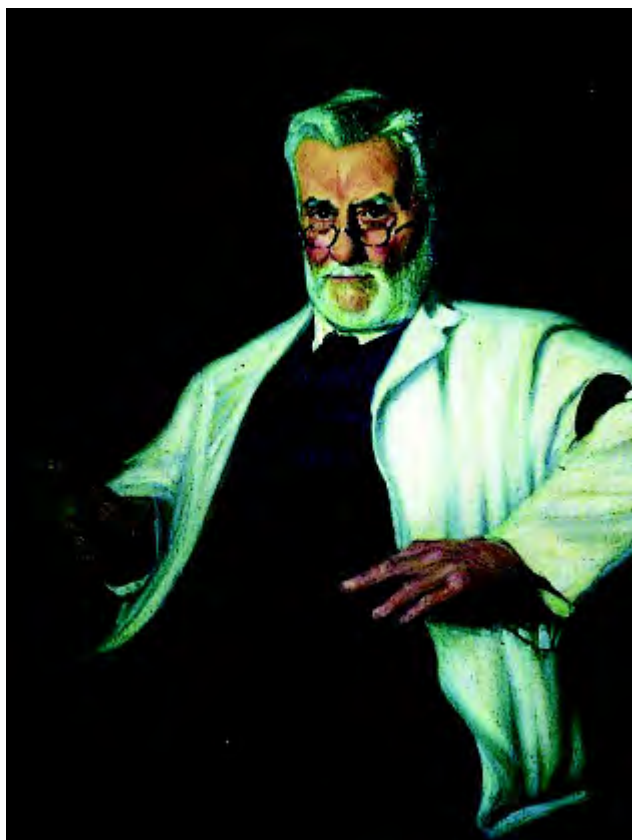
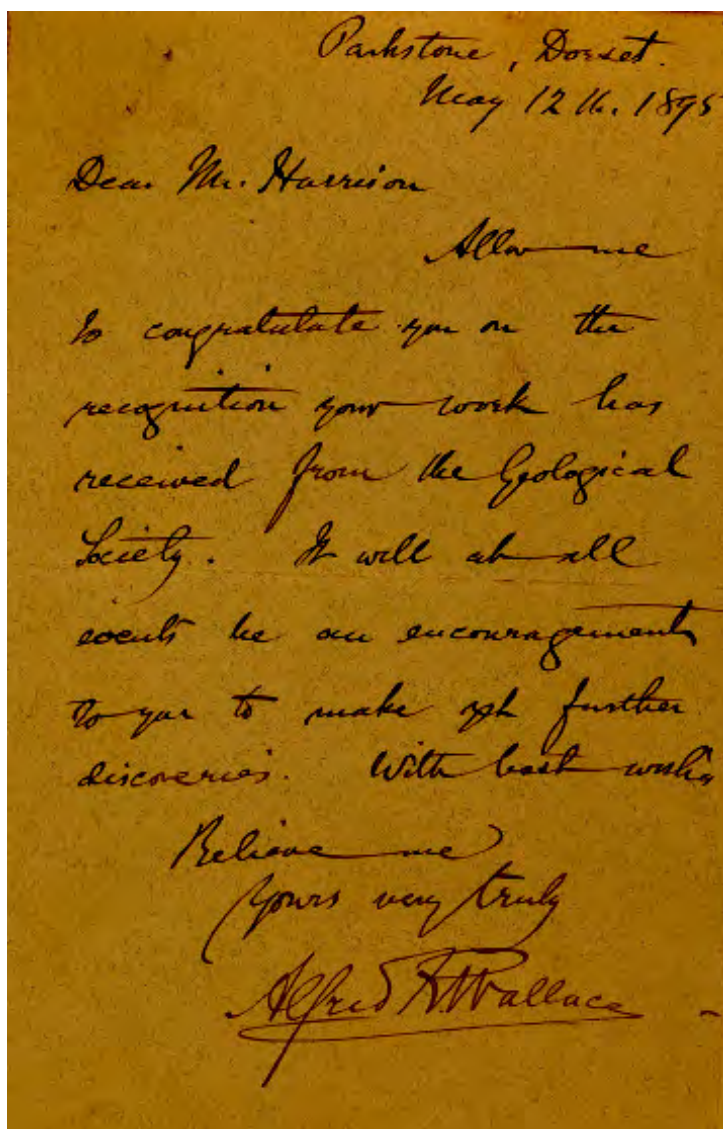


Figure 2. Benjamin Harrison. Portrait by Cyril Chitty in the Maidstone Museum (accession no. MNEMG 26.1922): oil on canvas 65 x 78 cm, and purchased for £30.00 through a subscription organised by J.H. Allchin in 1922. It is inscribed ‘Benjamin Harrison. Archaeologist of Ightham 1837-1921’. The original, also by Chitty, was owned by Edward Harrison. Copyright: Maidstone Museum and Bently Art Gallery.

Nineteenth Century (Harrison, E., 1928: 130). Wallace replied on 20 January 1888³ suggesting that human antiquity in America as evidenced by the Calaveras skull went beyond the Palaeolithic gravels, thus implying a North American eolithic⁴. Wallace cites attitudes to the authenticity of the Calaveras skull from various American geologists 'who seem afraid to accept it', and urged Harrison to read his account of the collections of flint implements held in American museums. In turn, Harrison told Wallace of his own discoveries, and of their high antiquity. Writing to Harrison on 30 January 1888⁵, Wallace expresses his pleasure in Harrison's appreciation of his work on the antiquity of man in the Americas and again suggests that Harrison might care to



Parkstone, Dorset.
May 12th. 1895

Dear Mr. Harrison

Allow me
to congratulate you on the
recognition your work has
received from the Geological
Society. It will at all
events be an encouragement
to you to make yet further
discoveries. With best wishes
Believe me
Yours very truly
Alfred R Wallace

Figure 3. A letter written by Wallace to Harrison congratulating him on the success of his recent paper delivered (with Prestwich) at the Geological Society of London, 12 May 1895. Notebook 17, Harrison archive, Maidstone Museum.
Copyright: Maidstone Museum and Bently Art Gallery.

read his article on American Museums in the *Fortnightly Review* for September–November, in which are described ‘wonderful collections of stone implements in America’.⁶

It was not until 1890 that Prestwich felt ready to suggest to Harrison that he present his eoliths – despite the caution of Sir John Evans (Harrison, E., 1928: 212) – to the Anthropological Society,⁷ which he finally did on 23 June 1891, following two papers at meetings of the Geological Society early in 1891. Although we have a good report of the ‘crowded’ Anthropological Institute meeting, it would appear that Wallace was not present, though many of the emerging protagonists in the eolithic debate were, including Edward Burnett Tylor, General Augustus Henry Lane Fox Pitt-Rivers, William Boyd Dawkins, and John Evans.⁸ In November 1891 Wallace finally visited Ightham (*ibid.*, 171), and it was perhaps his letter of 3 November 1891 that caused Harrison to prepare an index of the contents of his notebooks about this time, in order that the records of particular events might be readily accessible. Certainly, this visit raised much interest amongst the eolith circle,⁹ and encouraged Wallace himself to acquire a collection of eoliths, some of which were eventually deposited in the Pitt-Rivers Museum.

It is clear, therefore, that it was at this time that Wallace emerged as one of Harrison’s key supporters, though some of his circle tried to persuade him against accepting Wallace’s interpretations against his better judgment. Thus, Worthington Smith, who had been an early admirer of Harrison’s eolithic claims, had by 1892 become more skeptical, writing to Harrison¹⁰: ‘I must say some of your figures remind me strongly of stones we get here which I look upon as natural stones’, and ‘It is very well to quote Wallace and others, but you yourself know more about stone implements than they. I esteem your own opinion most’. Many of the criticisms of the Kentish eoliths related to the uncertainty surrounding their position in the stratigraphy of the chalk plateau of the Weald, and it was generally reckoned that proof would come from careful excavations. It was Wallace who was amongst those who encouraged Harrison to dig,¹¹ and he himself appears to have collected eoliths in the Ightham and Ash areas with Harrison during the period 1891–1898, probably also having received some specimens as gifts or purchases from Harrison. Wallace’s correspondence with Harrison, along with at least some of the specimens and Harrison’s sketches of the same (Figure 4), were subsequently donated by his son, William George Wallace, to the Pitt Rivers Museum in Oxford, and there is additional correspondence in the Harrison archive at the Maidstone Museum.¹² Of the specimens, 22 remain of the 23 objects in the Wallace collection catalogued at the Pitt Rivers Museum.¹³ The first 13 items (1946.12.36–49) were collected by Benjamin Harrison in 1898 in the Ightham area and are on average 88.46 mm maximum diameter, ‘yellow-brown., much patinated flints with large areas of the cortex remaining ... of irregular form – all having high-angled ‘flaking’ (sometimes as much as 90 degrees to the horizontal) now much worn and abraded’ (figure 5a, 5b, 5c, 5d)¹⁴ An additional three ‘eoliths’ were made by Harrison and given to Wallace (1946.12.60–62).

A particular feature of Wallace’s engagement in the controversy surrounding eoliths was his ability to draw upon his extensive periods in South America and the East Indies to provide examples of the use of stone tools by nineteenth century inhabitants

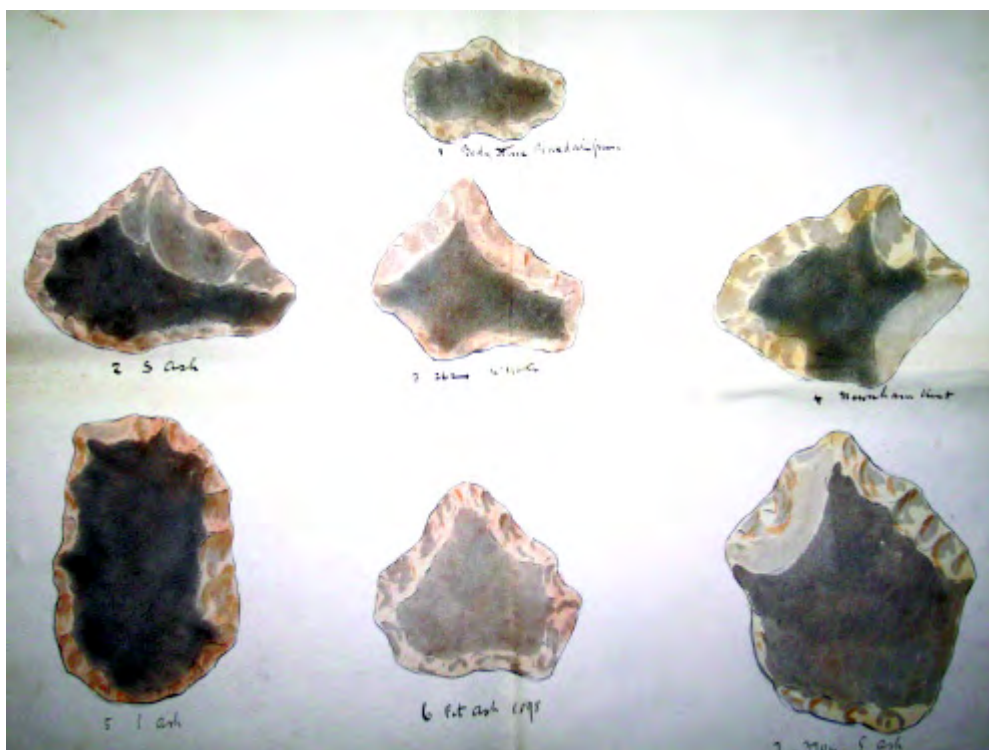


Figure 4. Sketches of eoliths collected by Benjamin Harrison in the vicinity of Ash, Kent. Part of the collection belonging to A.R. Wallace and gifted by William George Wallace to the Pitt Rivers Museum. Miscellaneous Manuscripts 11. Copyright: Pitt-Rivers Museum, Oxford.

of these areas. A particular category of implement prominent in the debate, and one that drew heavily on ethnographic parallels, was ‘body stones’. Wallace had taken this up in a letter to Harrison, and Harrison had then corresponded with Sir Edward Tylor on the subject in January 1898,¹⁵ referring to evidence from travelers who encountered natives in Australia, Patagonia (particularly Tierra Del Fuego), the East Indies and the West coast of Africa using stones as ‘body scrapers’ to remove hard skin on the feet to prevent corns and lameness (see also Anon., 1907: 142, Quick, 1899: 338, Harrison, 1904: 18).¹⁶

Wallace was still corresponding with Harrison in 1906, at the age of 83,¹⁷ when the issue of the moment in the eolithic debate had turned to whether the artifactual characteristics of eoliths could have been produced by certain non-anthropogenic geological conditions. Foremost amongst the advocates of this view was the French prehistorian Marcelin Boule (1905), who had claimed that eolith-like objects could be produced in cement-mills. Harrison wrote to Wallace¹⁸ about this, reporting on his response to Boule’s claims, on his own collections of ‘mill battered stone’ and on visits by him (and also Sir John Lubbock) to cement works, wash-mills and brickyards in the vicinity of Sevenoaks (figure 5e, 5f). The Pitt-Rivers collection contains nine fragments of black flint (PRM 1946.12.50-59) of 6.44 mm average maximum diameter collected by Harrison from waste heaps in chalk mills, the rough flaking and battering on their edges intended to show how much they differed from his ‘eoliths’. Harrison’s own

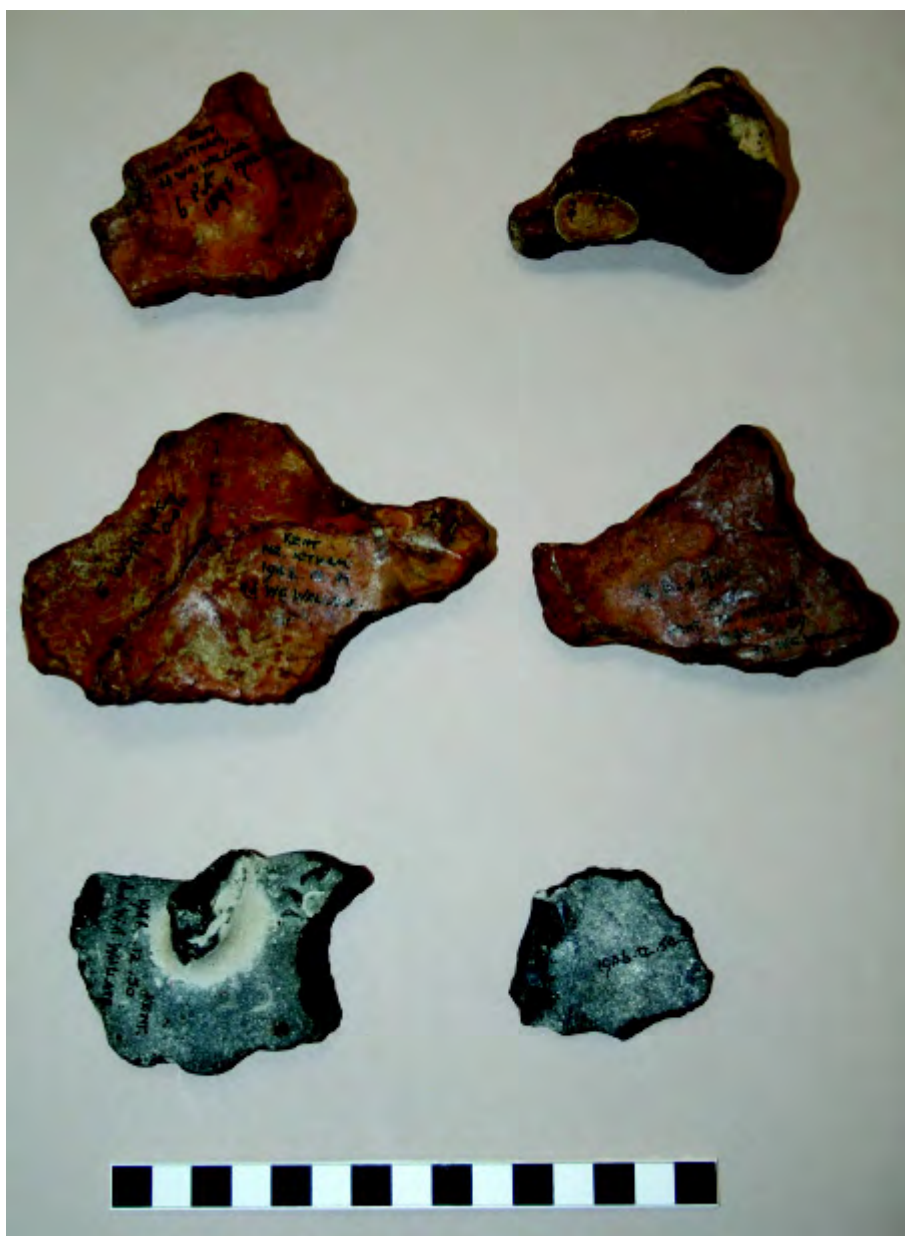


Figure 5. Eoliths collected in the vicinity of Ash, Kent, by either Wallace or Harrison and in the collection donated to the Pitt Rivers Museum by George Wallace in 1946. The specimens illustrated reflect the range of ‘types’ identified by Harrison (1892): (a) 1946.12.36, best fits ‘chopper’ type; (b) 1946.12.39, best fits ‘double curved scraper’, sometimes described as ‘bow scraper’; (c) 1946.12.41, best fits ‘double curved scraper’; (d) 1946.12.44, best fits ‘double curved scraper’, but beak-shaped when viewed laterally. The lower two specimens are ‘eoliths’ given by Harrison to Wallace, from waste heaps at chalk mills probably from Sevenoaks. The rough flaking and battering on the edges was intended to demonstrate how much these differed from ‘real’ eoliths: (e) 1946.12.50; (f) 1946.12.54. Copyright: Pitt-Rivers Museum, Oxford.

experimental work led him to be skeptical that ‘the genuine eolith’ and machine made artifact could not be distinguished, and we may reasonably infer from the correspondence that the same view was shared by others who he mentions, such as Ray Lankester, Ernest Westlake,¹⁹ and perhaps Lubbock himself. At about the same time, both Wallace and Harrison began to examine other claims for eoliths being made in the south of England and in Belgium, Wallace writing to Harrison with reports on ‘eoliths’ found near Fordingbridge in the New Forest by Ernest Westlake. Westlake had corresponded with Tylor in the 1880s and 1890s and his collection was eventually to be lodged for a period in the Oxford University Museum (Brecknell, 2007).

Conclusion

Probably the best compilation and summary of Wallace’s anthropological and archaeological writings is to be found in C.H. Smith’s *Anthology* (1991: 9-65). Here we find considerable evidence for his early views on Darwinism applied to humans, his ethnography of living peoples, the ‘degeneration hypothesis’, his concerns regarding the limits of natural selection (including his review of Darwin’s *Descent of Man*), his speculations on racial genesis, on language, and on the future evolution of mankind. But in all of this, in his autobiography and collected letters (1905, 1908; Marchant, 1916), and in a comprehensive bibliographic review of Wallace’s published work, there is little or nothing on eoliths, or concerning his interactions with the eolithic circle, as evidenced by his reading and correspondence, and through his known attendance at meetings of various learned societies. Given his productivity as a writer, this in itself is intriguing, and cannot be easily explained, other than to speculate that his other diverse intellectual and political commitments had greater priority for him.

Though active in mid-nineteenth century anthropological circles, and as a member of several overlapping learned societies and other networks dedicated to particular scientific objectives, Wallace always remained highly marginal. Socially, he was an outsider, and economically supported himself mainly by selling the natural history specimens he collected, until too infirm to travel. He did not fit the gentleman-scholar mould of Prestwich, Lubbock, and certainly not Darwin, with whom he had an uneasy relationship. He was marginal too in terms of his scientific involvement, partly because paid collectors were viewed as tradesmen among respectable scientists. With respect to class and social origins, he was perhaps closer to Benjamin Harrison, though with more literary confidence and experience. This may go some way in explaining their evident compatibility. But Wallace was also institutionally peripheral, in terms of his participation in both the Anthropological Society of London and the Ethnological Society of London, learned societies that until their merger in 1877 to form the Anthropological Institute (later the Royal Anthropological Institute) were ideologically and socially opposed (Stocking, 1971). It appears to have been precisely this liminality that led T.H. Huxley to suggest in 1866 that Wallace should head the anthropology subsection of the British Association for the Advancement of Science (then located within Section D), since only Wallace could mediate between the factions (Kuklick, 2008: 57; Huxley to Lubbock 1 August 1866, AP Add. MS 49641).

This same many-stranded marginality is reflected in his involvement in the eolith controversy. Although it might be argued that this was one of several lost causes that he espoused in the latter part of his life, we need to remember that at the time of

Wallace's death in 1913 the eolithic controversy was still very much alive and its advocates even in the ascendancy, uplifted by the discoveries at Piltdown and in East Anglia (Grayson, 1986: 106-15).²⁰ However, the second world war would effectively see an end to the eolithic controversy in Britain and the rest of Europe, in 1953 Weiner, Oakley and Le Gros Clark would definitively expose the fraudulent character of the Piltdown remains, together with the supporting role played by faked eoliths (McNabb, 2006), and the centre of attention in studies of the earliest stone tools would move from Europe to East Africa (Oakley, 1966: 172-3). However, even as late as 1946, Tom Penniman, in accepting Wallace's collection of eoliths for the Pitt-Rivers Museum from his son, William George Wallace, could thank him with the words: the eoliths 'will be of great value to us, and will provide what might be called "a link up" as Dr. Wallace was a "great man" on our subject'.

Acknowledgments

The research on which this paper is based was made possible through British Academy grant LRG44967, entitled 'The Eolithic Controversy as a Problem in the History of Science, and of Archaeology in Particular: an Approach from Cognitive Anthropology'. All the work on the Harrison archive in Maidstone was undertaken by Angela Muthana, who has also assisted generally throughout. For access to the Maidstone papers, and for permission to reproduce the letter from Wallace to Harrison and the portrait of Harrison, I would like to thank Giles Guthrie, Simon Lace and Clare Caless. For facilitating access to the Pitt-Rivers Museum eolith collection and accompanying material I would like to thank the curator Michael O'Hanlon, and in particular Zena McGreevy, Jeremy Coote, Philip Grover, Christopher Morton and Sian Mundell. Stella Brecknell at the Oxford University Museum of Natural History kindly allowed access to her catalogue of the Westlake papers, and an unpublished paper on the subject; while Ben Sherwood of the Linnean Society of London was able to assist in relation to the portrait of Wallace reproduced here as Figure 1.

Archives

BM: British Museum, Department of Department of Prehistory and Europe. Document Archive, Reg. Nos. 1900 10-9, 1-6. Deposited in Franks House, 56 Orsman Road, London.

MM: Maidstone Museum, Harrison archive.

OUM: Oxford University Museum of Natural History: III. Publications, etc. Box 2, Publications by Westlake.

PRM: Pitt-Rivers Museum, Oxford: Tylor Papers and Misc. MS 11

Notes

1. The most convenient summary by Wallace himself of his thinking on anthropological matters appears as the final chapter to his *Darwinism*, published in 1889. The chapter covers comparative anatomy, the geological antiquity of man, what we would now call cultural evolution, and his critique of Darwin's argument from continuity as it applied to mental faculties, including his view that certain cognitive features of the brain, for example mathematical ability, are unlikely to be accounted for through natural selection. See also the recent paper by Lowrey (2010).

2. For example, the correspondence extended to a common interest in spiritualism: e.g. MM Harrison archive Notebook 17: Wallace to Harrison, 30 December 1897, from Parkstone, Dorset.
3. MM Harrison archive, Notebook 4, p. 27: Wallace to Harrison, 20 January 1888.
4. This was allegedly from a Pliocene deposit, but in an interesting much later footnote to the controversy, Oakley (1966: 3) was able to show using fluorine testing that it was relatively modern: 'probably planted in the mine-shaft by a cowboy as a joke'. These were the same tests that had been successfully used to expose the Piltdown forgery (Weiner, Oakley and Le Gros Clark 1953).
5. MM, Notebook 5: Wallace to Harrison, 30 January 1888, from Frith Hill, Godalming.
6. There are, in fact, two articles by Wallace on American museums for 1887 (1887a and 1887b). It is the second that he appears to be recommending Harrison to read.
7. MM: Prestwich to Harrison, 9 December 1890 (Harrison, E. 1928: 157)
8. MM: Harrison to W.M. Newton, 3 June 1908.
9. E.g. Prestwich to Evans, 10 November 1891, and Prestwich to Evans, 18 November 1891 (see Prestwich 1899: 359-60).
10. MM: Worthington Smith to Harrison, 12 April 1892 (Harrison 1928: 176).
11. MM: Wallace to Harrison, 8 November 1893 (Harrison 1928: 189).
12. E.g. MM Notebook 30, p. 31: Wallace to Harrison, 26 June 1899.
13. PRM Box 9: 1946.12.36-62. Of these, 1946.12.40 was sent in 1950 to the Australian Museum in Sydney as part of an exchange.
14. Examination of the eoliths by Angela Muthana, plus some contextual data, makes it clear that 1946.12.36 is definitely from Pit 6, Parsonage Farm (Stanstead, Near Ash). Of the remainder, most are from West Yoke or South Ash (though confusingly West Yoke is sometimes labeled on the stones as South Ash), and a few are from Plaxdale Green and Newnham.
15. PRM Misc. Ms 11: Harrison to Tylor, 10 January 1898; also an undated letter from Harrison to Wallace on body stones; PRM Tylor Papers, Box 12: Harrison to Tylor 22 June 1899: Item 13
16. Some indication of the exponential imagination involved in body stone studies is found in the work of Marriot (1916).
17. PRM Misc. Ms. 11: Harrison to Wallace, 9 August 1906.
18. PRM Misc. Ms. 11: Harrison to Wallace, 9 January 1906.
19. Harrison, E. 1928: 278. On the Hampshire eoliths collected between 1890 and 1902 by H.P. Blackmore and Ernest Westlake see: Westlake, E. (1902) Note on recent discoveries of Palaeolithic and Eolithic implements in the valley of the Avon (reprinted from King's Fordingbridge Almanack, for 1903). A copy of this document can be found among the Westlake papers lodged in the Oxford University Museum of Natural History: III. Publications, etc. Box 2, Publications by Westlake.
20. PRM: T.K. Penniman to W.G. Wallace, 9 December 1946, referred to in PRM Object Catalogue, under accession number 1946.12.36.

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Family background of Peter Forsskål, Linnaean Disciple born in Finland

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Brief biographical introduction

Peter Forsskål¹ was one of those pupils of Carl Linnaeus who lost their lives on expeditions in distant lands. He was the naturalist member of the famous Arabian Expedition (1761-1767), sent by Denmark to study the nature and culture of Yemen, “Arabia Felix” of olden times.



Peter Forsskål, portrait by Paul Dahlman 1760.
National Board of Antiquities, Finland. Photo Bo Gyllander.



After spending his childhood in Finland, at that time the eastern provinces of Sweden, Peter Forsskål moved to Sweden proper with his family when his father changed his position as a vicar from Helsinki to Tegelsmora in the vicinity of Uppsala. Later on he studied philosophy, oriental languages and natural history in Uppsala and Göttingen. His thesis criticizing the prevailing wolffian philosophy aroused attention in Göttingen and another paper on civil rights, e.g. freedom of press, when back in Sweden, caused severe criticism. There were many phases around this matter which resulted in negative publicity for him in Sweden. Being obstinate and sure of his case, he never gave up and was in open conflict with the authorities. On the other hand his relationship with Carl Linnaeus, his professor, was close. At the time of the dispute Linnaeus was university rector and was put into an awkward position when he was obliged to handle the confiscation of the already published paper. Thus Forsskål's future in Sweden was uncertain and the invitation to partake in the Arabian expedition was certainly more than welcome.

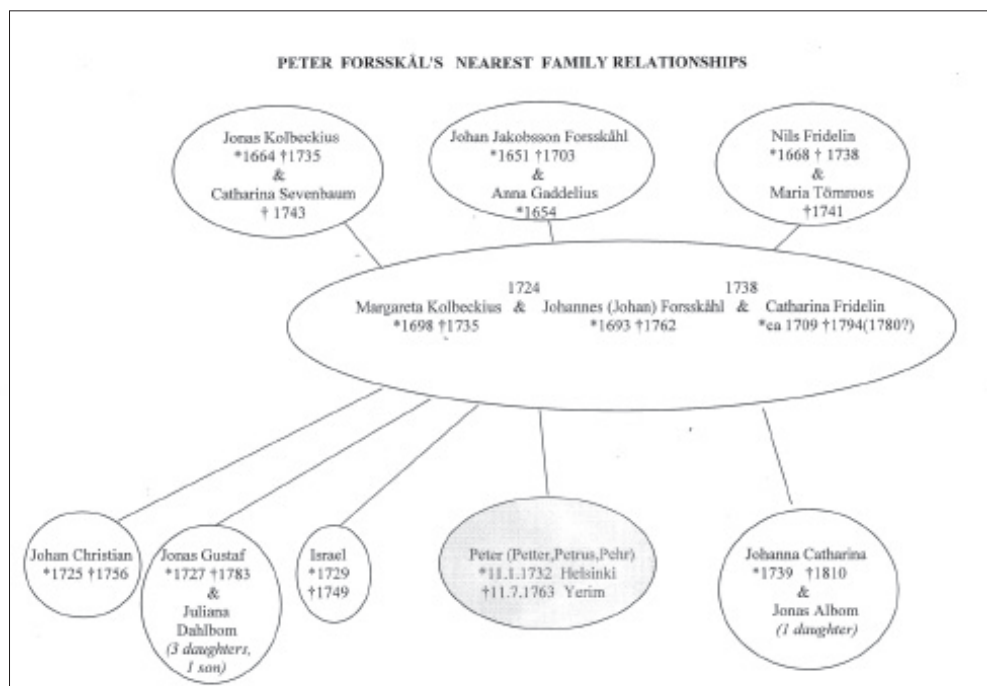
Of the longdistance expeditions with scientific goals, so much in vogue in the 18th century, this one is said to have been the very first thoroughly planned sent from Europe. Nevertheless it was ill-fated from the start: six men of very different mentality set off from Copenhagen after weeks of delays due to storms. In a little less than two years the company reached northern Yemen, via Constantinople and Egypt. To begin with, all was well and interesting fieldtrips were rewarding. But in half a year's time misfortunes began, including a predisposition to malaria in all expedition members in the unhealthy climate of the Red Sea coastal valleys. Forsskål passed away on July 11th 1763 in the small highland town of Jerim at the age of 31. He had been feverish for about a fortnight and had been carried on camelback barely conscious through a difficult mountain pass. In the course of three years all of the party except one had died.

The sole survivor, mathematician and cartographer Carsten Niebuhr returned to Denmark by way of India and Persia as late as 1767. Niebuhr saw to it that most of Forsskål's specimens and fieldnotes arrived back to Europe. It is also thanks to Niebuhr's dedication that the Forsskål papers were published. After settling down he published, in addition to his own diary *Descriptiones animalium*, *Flora Ægyptiaco-arabica*, both in 1775 and the following year the volume of illustrations *Icones rerum naturalium*. The Forsskål material, as well as other documents concerning the Arabian voyage, well kept and arranged in Copenhagen, are valuable and much used by researchers even today. Forsskål has certainly earned a permanent place in the history of natural history as well as in biological taxonomy.

His father's family

The Forsskål-family has been traced in southern and southwestern Finland as far back as the beginning of the 16th century. The parish of Sauvo can be considered the cradle of Peter Forsskål's family-branch. There were many clergymen in the family, of whom Sigfrid Forsskål, and later his son Simon, served there as vicars around the turn of the 16th and 17th centuries. Peter Forsskål's greatgrandparents were Jakob Forsskål and Anna Blåfield. Of their five children Johan Jakobsson Forsskål, crown official, head of Piikkiö hundred, was his grandfather.

Peter's grandmother from his father's side, Anna Gaddelius came from Sweden. She was the daughter of Per Gaddelius, vicar at Kjula, and Katarina Magnelius, daughter of the vicar of Ekeby. Johan Forsskål and Anna Gaddelius had five children, two of whom died at an early age. The second of the three boys, who lived until adulthood, was Johannes² (Johan) Forsskål, Peter's father. Grandmother Anna had six brothers and sisters, many of whom, in addition to herself, had close connections to Finland, both through marriages and through working duties.



His mother's family

Margareta Kolbeckius, Peter's mother was born in the parish of Kolbeck (Kolbäck) in Västmanland, Sweden as the second child of assistant priest Jonas Kolbeckius and his wife Catharina Sevenbaum. Their first-born died as a baby, so Margareta became the eldest of five children, two of whom also died at an early age. Peter's grandfather, Jonas became the vicar of Svedvi. Margareta had a short life, she died in 1735 in Helsinki after eleven years of marriage. Peter was three at the time of his mother's death.

Margareta's sister Hebbela Apollonia was married to Östra Löfsta's (Österlövsta) vicar Zacharias Westbeck, a very interesting personality: his sermons were informal and daring. He was stubborn but warm-hearted and friendly, interested in nature and especially agriculture as well as horticulture, on which he wrote publications. He was also a member of the newly founded Swedish Academy of Sciences.

Johannes Forsskåhl's second wife's family

Johannes Forsskåhl was single for many years after Margareta had died. He married again in 1738 Catharina Fridelin from Korppoo, southern Finland where her parents were the vicar Nils Fridelin and Maria Törnroos. Fridelin was especially interested in the Greek language – he even published poems in Greek. He died the same year as their daughter Catharina was married.

Brothers and sister

Peter had three older brothers, all born in Stockholm, and a younger half-sister. **Johan Christian** (1725-1756) became a clergyman but died soon after having just begun his career as a battalion preacher in Helsinki. He died unmarried at the age of 31 just as his brother Peter would seven years later. **Jonas Gustaf** (1727-1783) studied medicine at Uppsala University, where he earned a degree of medical doctor. He took a career in Örebro, Sweden as a doctor for nobility in Nerike (Närke). For about ten years he was also intendent at Medevi bath in eastern Götaland. Being kindhearted and open he was very popular amongst his patients. He married Juliana Dahlbom at the age of fifty but died only seven years later. They had three girls and two sons.

Next to nothing is known about the life of **Israel** (1729-1749). He was born in Stockholm where he also died at the age of twenty. He seems to have been sickly; sources say that he died of a stroke and was buried in St. Nicolaus church in Stockholm. At that time Peter was seventeen.

Johanna Catharina (1739-1810) was born in Helsinki as half-sister to the then seven-year-old Peter. She was to marry landsecretary Jonas Albom in Sweden. Twins were born to their daughter Johanna Sophia and her husband Samuel Jacob Gyllenadler. One, a daughter, died after birth, the other, a son, Claes lived to be 45. His descendants are many and the family still thrives in Sweden.

These descendants of Johanna in Sweden are the nearest known relatives of Peter Forsskål today. Members of the Forsskåhl-family in Finland and in Sweden are separated by many generations – common ancestors are to be found as far back as the 17th century.

Father Johannes Forsskåhl

Johannes Forsskåhl was a distinguished clergyman of special quality. Born in

Sauvo with his fathers roots deep in the soil of southern Finland, he began theological studies at the nearby Academy of Turku. The Great Northern War affected Finland drastically and he moved away from Finland to complete his studies at Uppsala. After ordination he was first appointed assistant priest and before long (in 1724) vicar of the Finnish congregation in Stockholm, a post which suited him well. In May 1724 he and Margareta Kolbeckius were married in Stockholm.

The Finnish congregation has much to thank him for. Amongst other achievements he succeeded in acquiring for the congregation a church of it's own, a building still in the same use today.

After a few years, in 1730, Johannes Forsskåhl moved back to Finland, to be the vicar of Helsinki. The town of Helsinki was at that time small and insignificant with less than 2000 inhabitants. The vicar of Helsinki also took care of the surrounding parish of Helsingin pitäjä (Helsinge). This post most surely was more respected and therefore better economically than the one heading the poor congregation of Finns in Stockholm. This was understandably important for Forsskåhl and his growing family. Moreover, he was also returning to Finland which, after all, was his home. Peter was born within two years and the boy came to spend his early childhood in Helsinki and it's surroundings. As time passed responsibility for the twin-congregations with primitive conditions became too heavy, whilst also Forsskåhl's health was deteriorating. The family returned to Sweden-proper when father Forsskåhl received a vicar's post in Tegelsmora, in the vicinity of Uppsala. After 8 years there Forsskåhl returned to the Finnish congregation in Stockholm until he was called to be vicar at Maria congregation, also in Stockholm, which post he kept until his death.

Johannes Forsskåhl was a humane, righteous and broadminded personality, a peacemaker and excellent preacher. He was energetic and had much authority.

His large library shows that he was deeply involved with theological matters but interested in many other sciences as well. He was greatly appreciated amongst his colleagues and other contemporaries although he never defended a doctor's degree and there are no publications from him. As an indicator of this he received a honorary doctor's degree in Uppsala in 1752. He was also more than once a member of Parliament.

Johannes Forsskåhl was a key person for Peter. The two were obviously close to each other. Father Forsskåhl only extremely reluctantly gave consent for his son to undertake the long and dangerous journey to Arabia. He knew very well the hazards and that lives could be in danger. He had already lost his wife and two of his sons and had good reason to worry about the fate of his youngest son. Peter kept his head although parting from his father must have been difficult. Linnaeus, amongst others did his utmost to help fulfill the plan. Before leaving Stockholm Peter allowed his portrait to be painted as a farewell-gift to his father. Today his relatives in Sweden still cherish this oil-painting by Paul Dahlman.

Father Forsskåhl passed away in June 1762. At that time Peter was in Cairo. We do not know when knowledge of this reached him or if it ever did. Letters to faraway places were months on their way in the 18th century. It is possible that the message was waiting in Jedda when the party had landed there in October. Forsskål's diary



Kumpula Botanic Garden of Helsinki University in early spring 2001. Kumpula manor was the second home of Forsskål's childhood family. The old buildings have long since disappeared but the undulating terrain must have been similar in Forsskål's time. The main building, just visible on the right behind the trees, stands on the same site as the original one. Photograph by Marjatta Rautiala.

skips the stay in Jedda altogether. Later on, in December, he writes to the Danish envoy in Constantinople expressing his wish to turn homewards as soon as possible. He had grown weary of the long distances and postal delays.

Peter Forsskål chose neither a theological nor a medical career, as did his brothers Johan and Jonas. Those were very popular careers amongst university students in the seventeen hundreds. Instead, Peter chose a path of his own. He distinguished himself in all of his manyfold philosophical, philological and natural history interests.

In spite of only spending his early childhood in Finland Peter Forsskål is highly esteemed amongst Finnish biologists and considered one of us. Father Forsskål owned Kumpula manor outside the town of Helsinki. By an interesting twist of fate, it is today Kumpula Botanic Garden of Helsinki University. Peter and his brothers must have roamed around the surrounding countryside and played on the banks of the nearby brook – today the economic and geographical sections of the university garden. A memorial plaque in his honour has been fastened on a building wall by the local authorities.

His contribution to science would, no doubt, have been even much greater had he been able to live an entire life. His destiny was sealed in Copenhagen when he stepped on board the Danish naval ship *Grønland* and began the long journey to southern Arabia which ultimately led to his tragic and untimely end on the rugged highlands of faraway Yemen.

Acknowledgements

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Notes:

1. Sources use both the family name as well as the first name in many forms. The family name appears as Forsskål, Forskål, Forsskåhl or Forskåhl. In this paper Forsskål (which he himself mostly used) is for Peter but Forsskåhl for his father and other relatives. In addition, other common forms of the first name Peter are Petter, Pehr and Petrus. He himself seems to have preferred Petrus. He could use even Pierre when writing in French. Peter seems to fit best in the English language.
2. Johannes instead of Johan for father Forsskåhl is used in this paper. Both are common in sources. This is done to distinguish him from his many Johan-named relatives, here specifically from his eldest son as well as his own father.

Selected references:

On Peter Forsskål's genealogy and childhood see:

RAUTIALA, M. 2009. *Petter Forsskålin juuret ja lapsuus Suomessa* [Peter Forsskål's roots and childhood in Finland]. Helsingin pitäjä 2010. Vantaa-Seuran vuosikirja [Yearbook of the Vantaa-Society] nr. 42, p. 18-35. In Finnish with ca half of the 49 references in Swedish. Contains references pertaining to this article.

For more information on the Arabian journey in English, see:

HANSEN, T. 1964. *Arabia Felix. The Danish Expedition of 1761-1767*. Translated by James and Kathleen McFarlane. London; New York.

HEPPER, F.N. & FRIIS, I. 1994. *The plants of Pehr Forsskål's Flora Ægyptiaco-Arabica*. Kew, Richmond & Copenhagen. General introduction on pages 1-51 contains an authoritative summary of the Arabian expedition, with special reference to Forsskål's botanical studies.

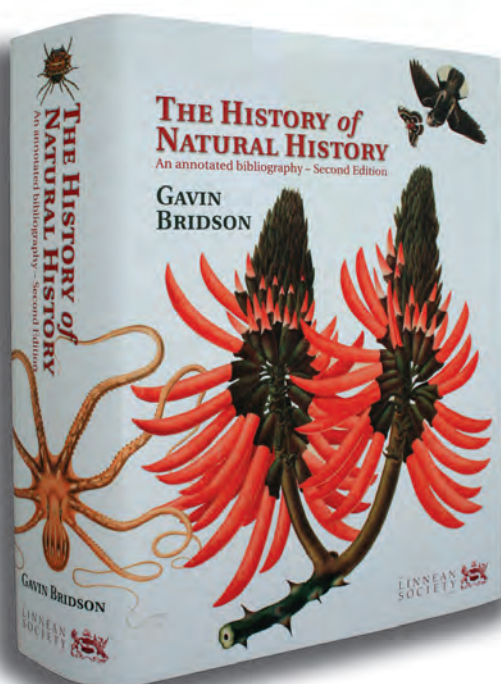
FORSSKÅL, P. 2009. *Peter Forsskål's journal*. Translated from the Swedish by Silvester Mazarella. In: *The Linnaeus apostles. Global science and adventure*, vol. 4, p. 281-380. Editor-in-chief: Lars Hansen. Issued by the IK Foundation & Company, London & Whitby.

WOLFF, T. 1968. *The Danish expedition to "Arabia felix" (1761-1767)*. Bulletin de l'Institut Océanographique, Monaco, Num.Spéc. 2: 581-601. Summary of the expedition with special reference to Forsskål's marine investigations en route to Yemen.

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| | | | |
|---|------------------|--|--|
| 17 th March | 6pm* Thurs | WHAT'S SO SPECIAL ABOUT BRITISH MAMMALS? Pat Morris FLS | Evening meeting |
| 24 th March | 2pm Thurs | STRAIN-INDUCED ASSEMBLY HYPOTHESIS AND THE GROWTH OF FORM David Knight FLS | Afternoon meeting |
| 14 th April | 6pm Thurs | SEEING REDD: SCIENCE, POLICY AND POLITICS IN BIODIVERSITY AND CLIMATE CHANGE Peter Bridgewater FLS | Evening meeting jointly with the Systematics Association |
| 12 th May | Thurs | VISIONS FROM THE BLIND SEER OF AMBON – A CELEBRATION OF GEORG EVERARD RUMPHIUS (1627-1702) AND HIS AMBOINESE HERBAL † Pieter Baas FLS A joint meeting with The Royal Netherlands Academy of Arts and Science and the Society of the History of Natural History supported by Annals of Botany and Yale University Press | Day meeting** |
| 19 th -20 th May | Thurs – Fri. | FROM ROYAL GIFTS TO BIODIVERSITY CONSERVATION: THE HISTORY AND DEVELOPMENT OF MENAGERIES, ZOOS AND AQUARIUMS. † Society for the History of Natural History | Two-day Joint meeting at Chester Zoo** |
| 24 th May | 4pm* Tues | ANNIVERSARY MEETING COMPLEXITIES OF A NEGLECTED TROPICAL DISEASE Dr Vaughan Southgate PLS | |
| 16 th June | 6pm Thurs | THINKING ART FROM WITHIN BIOLOGY Alexis Rago FLS | Evening Meeting |
| 24 th -26 th June | Friday – Sun. | FIELD EXCURSION TO CHEDDAR AREA OF SOMERSET ** † Pat Morris FLS For more details see the events leaflet or the website. | |
| 7 th July | 2pm Sat | CONVERSAZIONE at Cambridge University Botanic Garden | |

* Election of new Fellows † organiser(s) ** Registration required

Unless stated otherwise, all meetings are held in the Society's Rooms. Evening meetings start at 6.00pm with tea available in the library from 5.30. For further details please contact the Society office or consult the website (address inside the front cover).

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