'EDWARD HERON-ALLEN, ARCHAEOLOGY AND LOCAL HISTORY'

Edited by
TIMOTHY J. McCANN and JOHN E. WHITTAKER

TALKS DELIVERED AT THE
TENTH HERON-ALLEN SYMPOSIUM,
WEST SUSSEX RECORD OFFICE, CHICHESTER
JULY 2010

BY
DAVID A. BONE, MARTIN R. BATES
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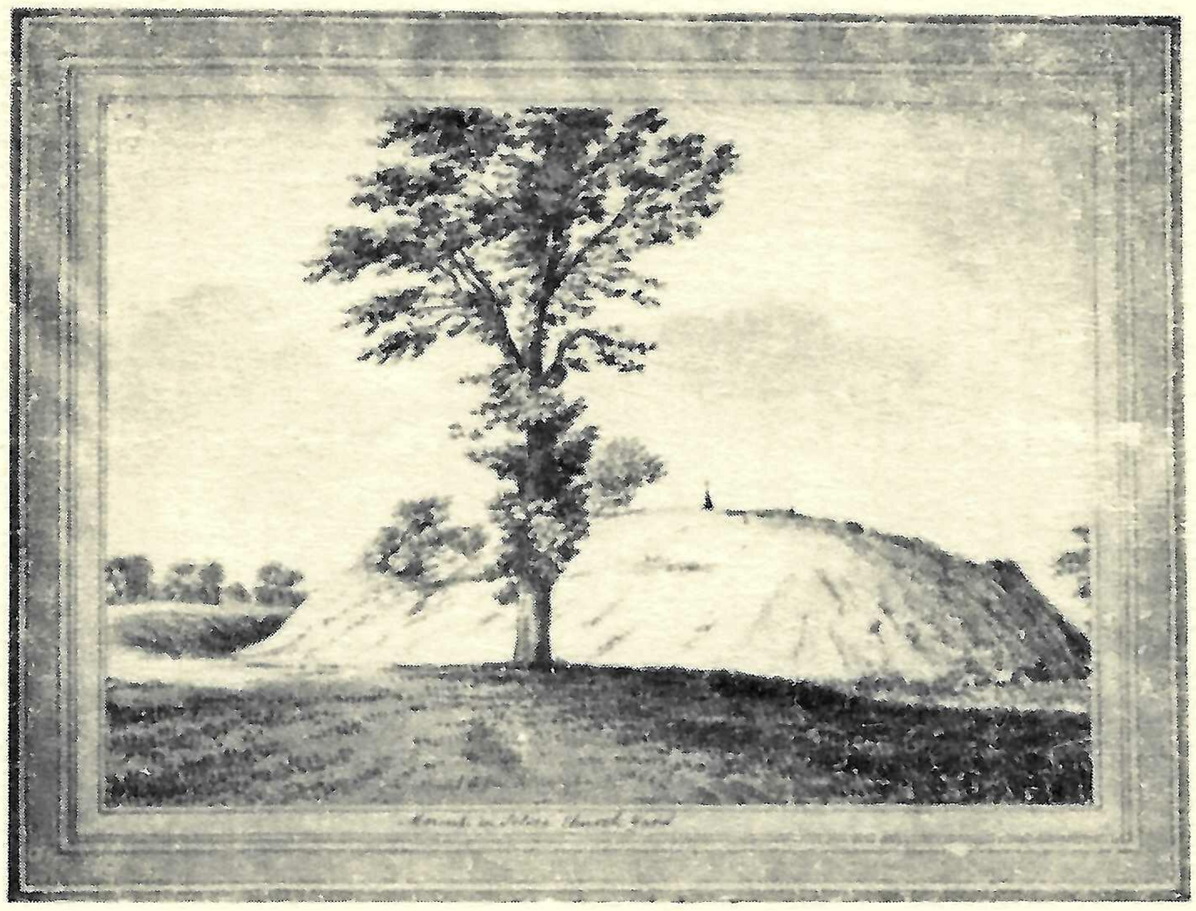

Opusculum XVI
Heron-Allen Society

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'Edward Heron-Allen, Archaeology and Local History'.
Proceedings of the 10th Heron-Allen Symposium, 2010:
Talks delivered by David A. Bone, Martin R. Bates and Timothy J. McCann at the Tenth Annual Heron-Allen Symposium, West Sussex Record Office, Chichester, July 2010.

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Cover: 'The Mound' in Selsey (Church Norton) churchyard in *c.* 1791.
Sketch by Samuel Hieronymus Grimm.

CONTENTS

Introduction, by Timothy J. McCann and John E. Whittaker.

Edward Heron-Allen and the Geology of Selsey Bill, by David A. Bone.

Edward Heron-Allen and the Quaternary Geology of the Manhood Peninsula: A view from the 21st Century, by Martin R. Bates.

Edward Heron-Allen, L.F. Salzman and 'The Mound' at Selsey, 1911, by Timothy J. McCann.

THE TENTH HERON-ALLEN SYMPOSIUM AT THE WEST SUSSEX RECORD OFFICE, CHICHESTER

by TIMOTHY J. McCANN and JOHN E. WHITTAKER

The theme of the Society's 10th Annual Symposium, held on Saturday, 3rd July 2010, was 'Edward Heron-Allen, Archaeology and Local History', and it seemed appropriate to hold it at the West Sussex Record Office, where Heron-Allen's local history papers have been preserved for so many years, and in Chichester, the nearest town to his home in Selsey and the place where his archaeological finds are deposited in the District Museum. There were four talks at the Symposium, three of which were devoted to the theme and are printed in this *Opusculum*.

In the first talk David Bone, geologist and local resident, discussed Heron-Allen's interest in the local geology, culminating in his 1911 publication of *Selsey Bill: Historic and Prehistoric*, which provided the first comprehensive and publicly accessible guide since that of Dixon's *Geology of Sussex* in 1850. He mentioned that the foreshore exposures of the 'Bracklesham Beds' (approx. 45 million years old) are recognised as a nationally important geological Site of Special Scientific Interest and discussed these in the light of Heron-Allen's work, showing how local geology also plays an important role in the landscape and archaeology of the area. The distinctive stone of the offshore Mixon rocks had been extensively quarried in times past and is to be found in many of Selsey's older buildings. The reasons behind the prohibition of its use had exercised Heron-Allen's enquiring mind, but only recently has David discovered the full story. Today, as he then pointed out, the soft clays and sands that form the 'Bracklesham Beds' are rapidly eroding and before the construction of sea defences, Selsey had one of the most rapidly retreating coastlines in Britain. In the light of this he examined the current plans to release further land to the sea via 'managed retreat'. Lastly, he gave a brief geological discussion of the true nature of Heron-Allen's Saxon 'feet', which are illustrated as archaeological artefacts in the book *Selsey Bill* and have recently been referred to in the Heron-Allen Society Newsletter No. 5.

Martin Bates, an archaeologist from the University of Wales, Trinity St. David, has long working experience of the fascinating Quaternary deposits of the Selsey (Manhood) Peninsula and has published extensively on them. He recounted some of his discoveries in the light of Heron-Allen's own researches. The area is a most important one and contains marine, brackish and freshwater sediments of the last 500,000 years. These are seen in raised beaches (e.g. Boxgrove) and coastal channels (e.g. West Street), each with a fascinating story to tell of alternating climate, including temperate conditions (some even warmer than today) or cold periods when tundra-like conditions prevailed.

The third talk by Timothy McCann was an examination of the archaeological excavation of 'The Mound' at Church Norton, near Selsey, by Edward Heron-Allen, L.F. Salzman and Claude Bishop in the spring of 1911. Their surviving correspondence and published excavation reports were used to show what they had hoped to find and how their ideas were challenged. Subsequent excavations have now led to a revision of some of their ideas.

The final talk was a welcome bonus and was by John and Barbara Mahoney, based on their latest research into the Sette of Odd Volumes. It relates to the discontent in that Society in 1889 and 1890 and the first skirmish before the dispute between Edward Heron-Allen and Richard Le Gallienne later led to former's resignation from the Sette. It formed an interesting preamble to the presentation they had already given at the 9th Heron-Allen Symposium at the Natural History Museum, London, and which was published in *Opusculum XIII* in 2009. We hope to publish their new revelations in a future *Opusculum*.

We are most grateful to Richard Childs, the County Archivist, for allowing us to meet at the Record Office, where a comprehensive exhibition of documents, books, photographs, maps and plans were on display to those attending the Symposium, illustrating the many facets of Heron-Allen's life. Members enjoyed a convivial lunch at 'No. 12', just round the corner from the Record Office.

Finally, one of us (JEW) wishes to thank his son, Gregory Whittaker, for manipulating the many illustrations for this publication. Ray Box and Jon Bull of Selsey Press have again produced a most professional publication.

EDWARD HERON-ALLEN AND THE GEOLOGY OF SELSEY BILL

by DAVID A. BONE

Having moved to Selsey in 1906-07, Heron-Allen quickly engaged in a wide range of local studies of which geology was but one aspect. In a remarkably short length of time, detailed geological descriptions, albeit with essentially the same information, were published in *Selsey Bill: Historic and Prehistoric* (1911), *Nature & History at Selsey Bill* (1911) and *Map and Guide of Selsey* (1912). Page numbers cited below, unless otherwise indicated, invariably refer to his great book, *Selsey Bill: Historic and Prehistoric*. His publications, however, leave some unanswered questions which the current author is pursuing and this paper includes a brief report of the progress to date on two of these items.

The geology of Selsey Bill is made up of underlying 'solid' geology that comprises relatively soft sands and silty clays of the Bracklesham Group, a series of marine and near-shore sediments that were deposited between 48 and 41 million years ago during the interval of geological time known as the Eocene (a sub-division of the Palaeogene Period). Overlying the Bracklesham Group are 'drift' deposits of muds, sands and gravels that were laid down during the Quaternary (Pleistocene and Holocene times), which date from around 400,000 years old to relatively recent times of

Fig. 1. Bracklesham beach on a bad day.

the Neolithic/early Bronze Age, about 4,000 years ago. Coastal erosion is aggressively wearing away these soft sediments, more-so in Heron-Allen's day which preceded construction of most of the sea defences in the 1950s and Selsey had "*the dubious distinction of having lost more land per yard of frontage than any other place in the British Isles in the 20th century*" (Mee, 1988). Low cliffs reveal some of the Quaternary sediments but the Bracklesham Group, the subject of this paper, is only exposed on the foreshore when the beach sand is washed away by the tides.

Heron-Allen was introduced to the local geology very soon after his arrival in Selsey when an attempt was made to bore for water at 'Large Acres' in January 1907 (p. 34). The exercise was abandoned at 97 feet when the record of a deep boring at nearby Park Farm in 1889 came to his knowledge. This was also in search of water and was abandoned at 552 feet but provided a detailed log of the geological strata through which the boring passed (Whitaker & Reid, 1899). Was this Heron-Allen's introduction to the geology of the area?

ON THE GEOLOGY

In *Selsey Bill* (p.30), Heron-Allen imaginatively recreates the ancient past to his readers by quoting from Jukes-Brown (1902), "*We must picture a country in which all the terrestrial agents of change were in full activity, a country where fire and water frequently contended for the mastery, where wide districts were devastated from time to time by burning streams of lava, but soon restored to fertility by cooling showers, and by the irrigation of a thousand streams that sprang from the slopes of cloud-capped mountains*". Unfortunately, this is not strictly accurate when interpreting the area around 45 million years ago in Eocene times.

Reconstruction of the palaeogeography indicates land 50km to the west, which was drained by one or more fairly substantial rivers and covered by lush vegetation, reminiscent of today's tropical rain forest. The coastal areas were fringed by mangrove palms and offshore beds of sea-grass thrived for at least some of the time. The sediments were deposited in a shallow sea, no more than 10 to 30m deep with a temperature of around 18°C. As Heron-Allen, noted (p. 39) "*... it is clear that the fauna is essentially tropical, and bears no relation to the existing fauna and flora of Britain*".

In fact, as Heron-Allen notes in *Selsey Bill*, the Bracklesham Beds have been studied in detail by geologists since the early 19th Century. Whilst there have been a number of specialist papers on elements of the flora and fauna, perhaps the key literature can be listed as:

- Mantell 1822 – *Fossils of the South Downs.*
- Bowerbank 1840 – *On the London Clay Formation at Bracklesham Bay.*
- Dixon 1850 & 1878 – *The Geology of Sussex.* [An extended edition of the original 1850 publication, revised and augmented by T. Rupert Jones, was published in 1878].
- Fisher 1862 – *On the Bracklesham Beds of the Isle of Wight Basin.*
- Reid 1897 – *The Geology of the Country around Bognor.*

Following Heron-Allen in 1911 with *Selsey Bill: Historic and Prehistoric*, we then have

- Curry, King, King & Stinton 1977 – The Bracklesham Beds (Eocene) of Bracklesham Bay and Selsey, Sussex. [This has been the most important study of the area, formalising the stratigraphy of previous authors and provided the subsequent studies, including]:
- Bone & Tracey 1996 – Aerial photography and geological mapping of Bracklesham Bay, West Sussex.
- King 1996 – The stratigraphy of the Bracklesham Group of Bracklesham Bay and Selsey (West Sussex, England): [an update covering the years 1977 – 1995].
- Daley 1999 – In *'British Tertiary Stratigraphy'*.

Heron-Allen points out (*Selsey Bill*, p. 37) that *"These Eocene strata – the Bracklesham Beds – form the most popular geological feature of the Peninsula, and have gained for our village a world-wide celebrity among geologists, who come from all parts of the earth to examine the outcrops, and to collect our typical fossils"*. This is so true that the foreshore from Selsey to Bracklesham has been designated as a geological Site of Special Scientific Interest (SSSI) and therefore receives a degree of protection under UK

legislation against potentially damaging human interference. The citation on the Natural England Website notes the geology as being essential to palaeo-reconstruction and stratigraphic studies (Natural England, 1989). It is also noted as being highly fossiliferous and is one of the most important sites in Britain to offer opportunities for study and research on the Eocene, particularly for plants and fish fossils.

Unfortunately the geology is not always particularly accessible, depending on both low tides and the removal of sand and shingle by wave action. Heron-Allen (p. 37) notes that "*A geological excursion around the Peninsula … is an arduous, and often very disappointing, undertaking*', a comment very similar to that of Dixon (1850) who wrote '*I have been greatly disappointed* [owing to] *sand, sometimes two to three feet in thickness, or the tide not leaving the shore sufficiently exposed; so that a stranger might conclude that there were no fossils to be procured at Bracklesham*". This poses the question – how much investigation did Heron-Allen do himself?

FOSSIL COLLECTING

Reference is made to Mr William Woodland, tenant of Medmerry Farm in the middle of the 19th Century (p. 37-38). "*In the middle of the nineteenth century Medmerry Farm was tenanted by Mr William Woodland, whose knowledge of the beds was intimate and peculiar. To him, therefore, the geologists of that period resorted for information and guidance, and he collected assiduously at all times of the year, so as to be able to supply geologists, and the museums of the world, with our typical fossils*". William Woodland would have been ideally located to hunt for fossils, Medmerry Farm being located on the coast west of Selsey and looking directly out over the fossil beds on the foreshore. By 1900, Medmerry Farm was being swept away by the sea but the Woodland family interest in the local geology continued because Heron-Allen goes on to note that "*The mantle of Mr William Woodland may be said to have fallen upon his son, Mr Thomas Woodland, who is today the only local authority. In his company we have made a long series of careful surveys and examinations of the shore…*".

This suggests that Heron-Allen was accompanied by Thomas

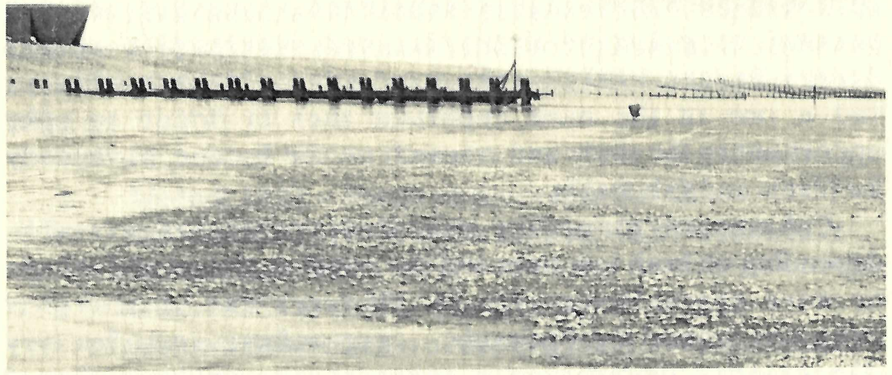

Fig. 2. Exposure of the fossil beds in Bracklesham Bay.

Woodland on his forays along by the beach, perhaps on a regular basis. Indeed "*Our geological map has been constructed, as we have pointed out, from careful surveys and examinations of the shore, made in the company of Mr. Thomas Woodland; and we hope that with its assistance, the field-geologist will be enabled to pursue his studies with the minimum of doubt and difficulty*". It would be interesting to learn more about the Woodland family, their involvement with local geology and just how much Heron-Allen relied upon their expertise.

Fisher (1862) divided the 'Bracklesham Beds', as they were then known, into four major groups and 22 different beds, all measured in paces along nearly 3 miles of foreshore from Selsey Bill to just east of Bracklesham. Heron-Allen takes this a step further by describing 34 'zones', measured (where stated) in yards rather than paces, extending the survey further along the coast and providing a detailed fold-out map. He does caveat any comparison with Fisher's work by noting coastal retreat of 50 to 60 yards due to erosion between the dates of the two studies. Heron-Allen's account generally agrees with modern descriptions, although there is at least one confusion where two separate beds are both referred to as being the Palate Bed; one "*opposite to the road connecting East Wittering*" (p. 50) and the other "*where old Bracklesham Barn stood on the shore*" (p. 51). This again suggests that Heron-Allen was not totally familiar with the geology himself and possibly relied upon others to communicate information to him. Nonetheless, the nine pages (pp. 50-58) that are dedicated to a detailed description

of the geological succession are an excellent guide as Heron-Allen intended: "*... we propose to take these Zones* seriatim, *in the hope that we may provide the field-geologist and palaeontologist with a useful vade-mecum for his excursion round the Bill*'. Of particular interest today are the details of the beds on the east side of Selsey Bill, these no longer being accessible due to a combination of coastal erosion and accretion of shingle.

In the chapter on the palaeontology (*Selsey Bill*, pp. 62-68), Heron-Allen includes a list of fossils but also notes that this "*... has gradually accumulated during three years of industrious collecting both by ourselves and our friends at Selsey*" and "*... has been completed ... from the lists given by Dixon, Reid, Godwin-Austen and Bell*". How much did Heron-Allen collect himself and how much was down to others? Perhaps we will never know but a study of the Bracklesham fossils from the Heron-Allen Collections in the Natural History Museum, Chichester District Museum and possibly elsewhere would be an interesting exercise. Confusingly, Heron-Allen combines all the fossils in a single list, the 45 million year old specimens from the Bracklesham Beds being marked with an E (for Eocene) to distinguish them from the Quaternary specimens that have ages measured in thousands of years.

The fossils, particularly the molluscs, from the Bracklesham Group are often extremely friable as Heron-Allen notes on p. 60

Fig. 3. Fossil shells at Bracklesham (45 million years old).

"*The field-geologist will be confronted with a very serious difficulty in collecting the fossils of the Selsey shore-beds, arising from their extreme softness and friability. Mr. Bell recommends that they be washed over with, or dipped in, a solution of diamond cement in water as soon as they are gathered. Mr. Fisher suggested for the same purpose isinglass dissolved in gin. We have tried both, with disastrous results*". Fossil collectors of today suffer the same problems of preservation involving delicate specimens.

Part of Heron-Allen's fossil collection has found its way into the Chichester District Museum. Whilst the material has been absorbed into the museum's collections, it still has the original labels and much of it was sorted some years ago by Jon Todd (now Curator of Molluscs in the Palaeontology Department at the Natural History Museum, London). The collection will soon reside in a new purpose-built museum in Tower Street, Chichester, due for completion in late 2011, and it is hoped that the Heron-Allen Collection can be given more recognition than it has today.

QUARRYING THE MIXON

Whilst discussing the geology, Heron-Allen mentions the Mixon, an offshore rock reef just over 2km to the south-east of Selsey Bill. Only accessible today by boat and submerged at high tide, he notes on p. 53 that "... *a shingle spit called the 'Winkle Bed' stretches out in a south-west direction to the Mixon Beacon which can be reached on foot at low tide. There is not however time for the return journey, and the walk over it to the Mixon Beacon must not be attempted without a boat in attendance*". The Mixon is made of a slightly sandy, foraminiferal limestone, the microscopic foraminifera being clearly visible when viewed with a hand lens. The number of warm water species suggests a brief interval of geological time when warmer waters from more southerly latitudes reached the seas that covered this area at the time. The sediments were probably deposited within a shallow water sea-grass environment.

Mixon is used extensively around the Selsey peninsula as a building stone, giving a warm orange-brown colour to the older houses and walls. It was quarried from the reef at low tide and brought to land by boat, a practice that seems to have been continuing since Roman times (the stone is used in Fishbourne

Roman Palace just to the west of Chichester). Use of the stone for building had ceased by the early 1900s and Heron-Allen sought to establish the reason: "*This extraordinarily interesting rock which forms the Mixon reef was, until the practice was forbidden some eighty years ago, extensively quarried for building purposes...*". Heron-Allen was put on the track of contacting 'Governmental Departments' from clues given by Reid (no source given, possibly a letter or verbal communication), Dixon (1878, 61) and Dally (1828: 111), which he quotes. Clement Reid "... *understood that the Mixon reef ... came under the jurisdiction of the Admiralty, and the Admiralty thought that the destruction of the rocks would damage the anchorage on the lee-side of Selsey Bill*". Dixon noted that "*No more stone is now taken, as these rocks serve as a defence against the rapid encroachment of the sea*", whilst Dally states that the "... *Government have lately prohibited further access to this ledge, on account of an alleged injury to the harbour.*"

Letters containing Heron-Allen's enquiries have been located in The National Archives in Kew. The actual responses have not been found but internal memoranda make interesting reading. For example, there is that of H.M. Coastguard (8 December 1910): "*As far as I can make out Mr Allen requires a few rocks to build a rockery, and in my opinion if he had helped himself to his requirements instead of asking questions nothing more would have been heard of the matter. Possibly the fact that two men were drowned yesterday in the simple operation of salving a wooden cask, will bring home to him that quarrying on the high seas is not only difficult but dangerous*". There is also that of the Harbour Dept., of the Board of Trade (10 April 1911): "*As Mr Allen's enquiry is made merely for the purpose of writing a book, it does not seem that the matter need be pursued any further*". Apart from the negative replies that must have followed, the dates suggest that Heron-Allen was running out of time before publication of his book. In any case, he concludes (p. 38) that "*We have endeavoured in vain to obtain from various Governmental Departments any information as to when, or why, and by whom, the quarrying of the Mixon Reef for building purposes was forbidden ...*".

Further research at The National Archives has located the information that Heron-Allen was unable to obtain. The quarrying of the Mixon reef was indeed prohibited by 'the Government' as

recorded by Dally in 1828. The story essentially starts with a petition raised in 1826 by pilots, fishermen and other seafaring folk, which reads:

That it is with reluctance Your Humble Petitioners feel themselves again compelled to address your Honourable Board but they see, with regret and alarm that, the Anchorage called the Park, (which has been known for ages to afford such security to the Coasting Trade, and our vessels in the Fisheries,) is now in a course of total destruction by the removal of the Rocks from the Mixon Reef (which forms such a complete Breakwater to this Roadstead in all westerly Gales) there now being upwards of Eighty Tons of Small Vessels constantly employed, whenever the tide suits, in removing the Rock and the number continues to increase.

The rest of the story is still being researched but a fascinating account of investigation, allegation, defence and appeal follows over the next year or so, much of it documented in the records held by the National Archives. There was, indeed, a prohibition order issued in 1827 but a copy of the order itself has not yet been located. The archives of the National Maritime Museum at Greenwich has been identified as being worthy of investigation. The study continues.

SAXON FEET – OR ARE THEY?

Selsey Bill features one of 'Heron-Allen's feet', to use the colloquial term. Illustrated in Plate XXIII and discussed on p. 103; "*... one of our Selsey fishermen, trawling in the waters traditionally covering the site of the submerged cathedral ... brought up in the year 1909, a primitively but accurately sculptured foot in Caen stone, which is essentially early Saxon in style and workmanship*". A second 'foot' was found in 1939, which the label attached to the specimen describes as a possible "*query an 'artefact' or 'pseudomorph' of a 'foot' or similar to that figured*" being found on the coast opposite the Isle of Wight. It is much more weathered and grey in colour, unlike the predominantly fawn-yellow colour of the 1909 piece. The wording of the label suggests that Heron-Allen had doubts about the authenticity of this as a piece of sculpture. A note in the Heron-Allen Society Newsletter No. 5 on an exhibition

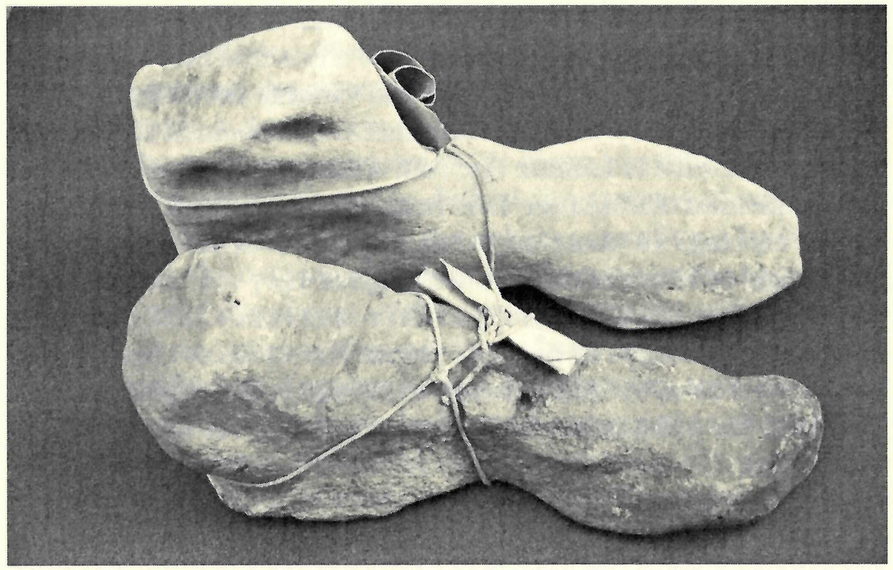

Fig. 4. Heron-Allen's Saxon 'feet'.

in Chichester District Museum notes "*Until recently they were labelled as the feet from a statue or rude from the Anglo-Saxon cathedral at Church Norton. However, the general consensus now is that they are a natural phenomenon and a fluke of nature*" (Seddon, 2004). This conclusion was based on the considered opinion of the present author.

Caen Stone, which Heron-Allen believed the stone to be, is a fine-grained yellow to yellowish-white coloured limestone from the Caen area of Normandy, extensively used in ecclesiastical and royal works. Its major use in Britain was during medieval times (an early use was in the White Tower of the Tower of London in 1097), with a resurgence in the 19th Century particularly associated with the Victorian repair and reconstruction of numerous parish churches. However, these two 'sculptured feet' are not Caen Stone. Both are actually formed from slightly glauconitic calcareous sandstone with the external colour difference due to weathering effects. The stone compares closely with the matrix of the Bognor Rock, an Eocene age (part of the London Clay Formation) rock reef that outcrops on the foreshore at Bognor Regis, 8km to the north-east of Selsey Bill. To confirm the identification, close inspection of the illustrated 'foot' also reveals a section through and a water-worn impression of the common Bognor Rock fossil mollusc,

Glycymeris brevirostris. Whilst Bognor Rock is commonly used as a local building stone, it is certainly not a material that lends itself to intricate carving due to its hard and variable lithology.

A recent enquiry with the Sculpture Department at the Victoria & Albert Museum in London (Dr. Paul Williamson, pers. comm.) has also confirmed that neither 'foot' bears any resemblance to known Saxon carvings or those of other periods. Neither is there any indication of features that would suggest they are sculptures of either bare or shod feet. So, not Caen stone, not Saxon and not sculptures – perhaps an instance where Heron-Allen's imagination got carried away or just wishful thinking? A full report will be prepared for publication in *Sussex Archaeological Collections* in due course.

COASTAL CHANGE

In Heron-Allen's day, the coastline of the Selsey peninsula was rapidly eroding due to the onslaught of the sea on soft-sediment geology, much of it protected only by a shingle ridge. At one time it was known as one of the fastest eroding stretches of coastline in Britain with up to 8m being lost each year. Significant sea defences were not constructed until the 1950s and these now protect the town from further coastal retreat, although beach levels continue to lower as erosion continues. West of Selsey and towards Bracklesham, the shingle bank at Medmerry is still the only protection for the second largest caravan site in Europe, a further 300 properties and 650 hectares of land, the latter including the rough grazing of the Earnley marshes and land owned by the Royal Society for the Protection of Birds (RSPB). Sea level is slowly rising and climate change has brought more frequent violent storms with the result that the shingle ridge is no longer adequate. Over-washing occurs several times each year and the shingle bank has breached 14 times since 1994 despite repairs to the shingle bank at a cost of £200,000 to £300,000 each year. The most recent event in March 2008 caused an estimated £5 million of flood damage at the West Sands Holiday Village and required evacuation of the site. With rising sea levels, which are predicted to be around one metre higher in a hundred years from now, it has become necessary to adopt a more sustainable long-term strategy.

A major scheme is now in progress under the direction of the

Environment Agency, which acknowledges the inevitable consequences of sea level rise and coastal erosion. Known as 'managed retreat', the scheme involves the construction of a new sea wall with a design life of 100 years inland of the Earnley marshes. Rock armour groynes, with stone brought in by sea by barges, will be constructed to defend the caravan sites from the effects of storms and reinforce the existing coastline. A breach will be created in the existing shingle bank, allowing return to a natural pattern of tidal inundation of the low-lying ground without threat to buildings or caravans. This creation of new intertidal habitat has been identified as a major bonus in offsetting loss of similar habitats, many of which are designated conservation sites, due to urban development and rising sea level, particularly around the Solent area. Work at an estimated cost of £8-10 million, rising to £250 million total cost for the full 100 years protection, starts in April 2011. This will be one of the greatest changes to coastal Britain in recent years.

The impact of the managed retreat on the geological SSSI and the future condition of the foreshore exposures is unknown due to difficulties in modelling coastal changes to the required precision. It must also be admitted that geology is not high on most people's agenda, with the impact on ecology and human activities taking much higher priority. Discussions with the various parties involved in the scheme have endeavoured to, at least, minimise or prevent any permanent damage to the fossiliferous sediments during the construction work. At the moment, all this is in the future, albeit the near future. Hopefully, a future report will not only say that damage was insignificant but also that the geological exposures have been enhanced as the shoreline can continue its natural erosion.

CONCLUSION

Heron-Allen did much to promote the geology of Selsey, perhaps not all his own work or strictly accurate. His work, however, remains an outstanding example of work by a 'local' geologist and is still useful reference material today. Interest in both the Bracklesham Group and Quaternary geology continues today. As well as research, the area receives numerous visits from individuals and special interest societies. Fossil hunts are organised by Chichester District Museum several times each year and a guide

to fossil hunting at Bracklesham and Selsey was published by this author in 2009. Heron-Allen would undoubtedly be astonished at the changes brought by coastal erosion in the last 100 years and the managed coastal retreat planned for the future. Let us hope that the geological richness and diversity can be preserved for future generations.

ACKNOWLEDGEMENTS

My wife, Anne Bone, kindly provided critical comments and proof-reading of this article. The note on the Mixon quarrying is from a joint project with her that will be published in *Sussex Archaeological Collections* (SAC) in due course. Thanks also to Paul Williamson, Keeper of Sculpture, Metalwork, Ceramics & Glass at the Victoria & Albert Museum for looking at the 'Heron-Allen feet' and allowing his opinion to be published.

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EDWARD HERON-ALLEN AND THE QUATERNARY GEOLOGY OF THE MANHOOD PENINSULA: A VIEW FROM THE 21ST CENTURY

by MARTIN R. BATES

Today the importance of the Quaternary Period[1], the time period encompassing the great periods of ice advance and retreat of the last two million years or so, is self evident. The modern world we live in is one in which the dangers of climate change are well appreciated (by most). But it has not always been the case and the recognition of the importance of this most recent of geological periods has been one of the key stories in earth history during the last 50 years. However, our discipline has deep roots and as we trace the history of the subject back before the Second World War we find that both amateur and professional earth scientists were building the foundations of the discipline we now recognise as Quaternary Science. Indeed Edward Heron-Allen wrote in *Selsey Bill: Historic and Prehistoric* (1911, p. 32) that....

> "The Pleistocene brings us to the most interesting, and for us, the most important period of earth's history, at any rate, so far as we are concerned in Selsey."

This statement made by Heron-Allen was perhaps at the time a contentious one and certainly one that might well have been disputed by those steeped in a more traditional 'hard rock' geological background but it shows us that Heron-Allen was perfectly aware of the importance and significance of the Pleistocene within the history of geology.

Although Heron-Allen did not publish extensively on Pleistocene geology he did take an active interest in the Pleistocene of the Selsey area. With this in mind this contribution will consider the nature and significance of the Pleistocene geology of the Manhood Peninsula (both in connection with Heron-Allen's contribution as well as from the perspective of the 21st Century) within the context of West Sussex and southern England in general.

QUATERNARY SCIENCE IN THE EARLY 20TH CENTURY

When we think about a scientist such as Edward Heron-Allen, working in the early part of the 20th Century, we must remember that the discipline of geology, as well as the frameworks describing past climate change were in their infancy and very basic when compared to today. Scientists at this time were limited to field observations where order in the geological record was provided by the order of the strata in the ground (stratigraphy) and (where direct links between strata could not be demonstrated) by the fossil content of the deposits where Darwin's theory of evolution allowed fossils to be ordered. Beyond this it was difficult for geologists to directly date rocks and sediments of the past.

Following WW2 significant advances were made in the earth sciences and perhaps none more so than the application of the science of the atom used to date of wood and plant material (Radiocarbon Dating). This was followed by other radiometric techniques that for the first time allowed sediments and their contained fossils to be directly dated.

Returning to the early 20th Century, other limitations at the time were the very poor understanding of the nature of past climates and climate change. Field craft was often rudimentary in terms of recording observations and precisely locating the observations made was often difficult. Maps for locating sites and sections were commonly inadequate and surveying equipment for measuring elevation was often absent or unavailable. Moreover, at this time when workers were making records the use of photography of exposures and excavations was rare. However, what these early pioneers of Quaternary Science had access to, that is limited today, were many more exposures through the myriad of quarries, undefended coasts and newly excavated railway cuttings. Furthermore. these early scientists were unencumbered by modern Health and Safety restrictions allowing them access to areas now out-of-bounds to all but the most privileged of workers! As a result, although because of lack of detail (often frustrating to the 21st Century scientist), contemporary publications such as the *Proceedings of the Geologists' Association* or the *Journal of the Geological Society of London* contain many important observations and it is one of life's great pleasures to spend an

afternoon perusing back issues of these publications and (re)discovering forgotten sites and details.

There is also a mental shift required by the modern scientist when we view these pioneers of our discipline. This is the period (by and large) of the gentleman scientist working alongside and, as equals to, the few professional geologists and archaeologists of the time. It is a period of time in which the enterprise we call science was held in the highest esteem and prized above many other pursuits. Today, with the public mistrust of scientists only perhaps exceeded by their mistrust of politicians, this may seem a little alien to us. This perceived importance of the scientific pursuit is well illustrated by the sentiments expressed in a letter (held in the Chichester Record Office) written on the 27th June 1911 by R.A. Smith at the British Museum to Heron-Allen following the death of his father. He (Smith) suggests that.....

> "'I was sorry to hear of your family bereavement, but it must be a great consolation to retire early in life and elevate oneself to things that matter - such as the history and especially prehistory of Selsey."

To me this epitomises a period of wonder at the field of science, where the study of scientific goals was a thing to be held above all other pursuits, such that comfort could be gained through scientific endeavour even in times of difficulty. It is against this background that we can examine Heron-Allen's contribution to the Quaternary geology and early prehistory of Selsey and place these findings within a framework that we know today. In particular I would like to look at his fieldwork, the geology he recorded and his understanding of the greater significance of the observations he was making to our discipline in general.

SELSEY AND ITS QUATERNARY GEOLOGICAL CONTEXT

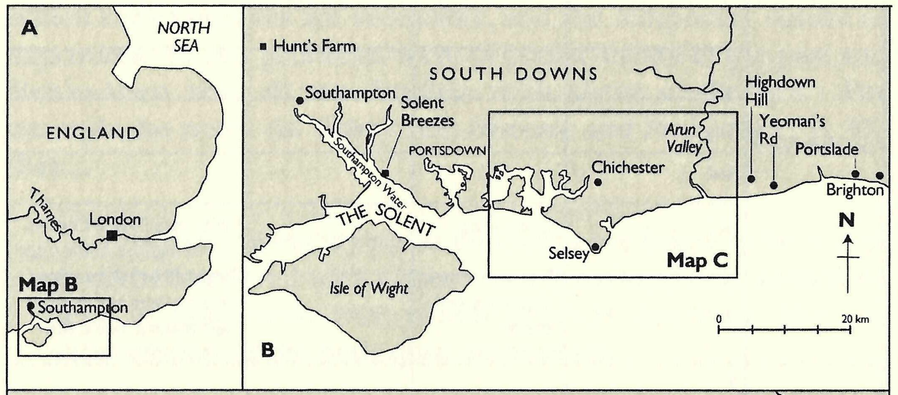
Today Selsey Bill lies at the southern margin of the West Sussex Coastal Plain (Figure 1) where the coastal plain extends nearly 16km from the foot of the South Downs to Selsey. This coastal plain is underlain by a variety of sediment types from marine sands

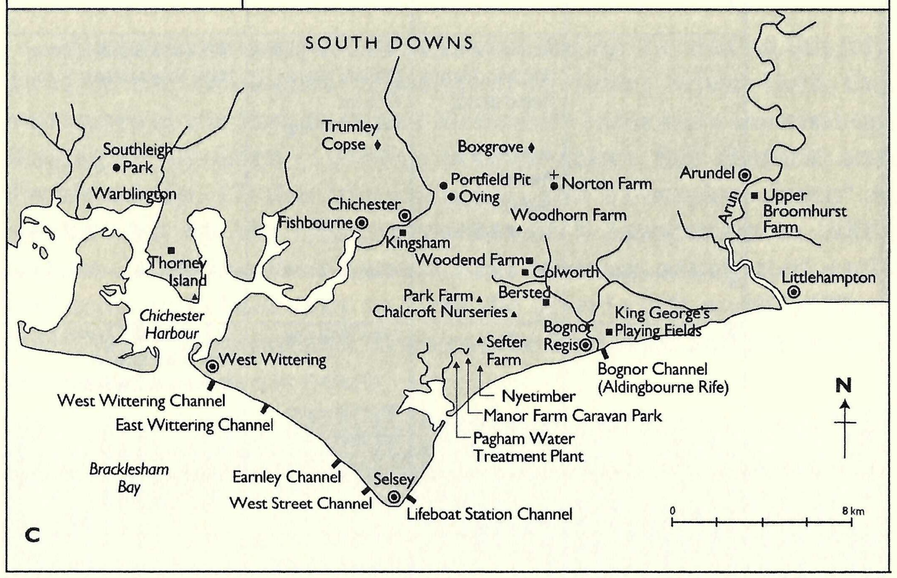
and gravels to sediments deposited across the plain during the cold periods when sea level fell and left tundra inhabited by mammoths and herds of horse and reindeer (Bates *et al.*, 1997; 2010). This complex record spans at least 500,000 years of earth history and records a number of periods of warmth when temperatures were at or above those of the present day (interglacials) and cold periods when the landscape of Sussex would have been dominated by frozen ground or grassland/tundra (Table 1).

The history of this ever-changing landscape was first documented by Mantell in 1822 and then by a local Sussex geologist called Dixon (1850) who described some of the first finds of fossil mammals in Sussex. He was followed by Joseph Prestwich, one of the founding fathers of Quaternary geology in Britain, who in 1859, in an early paper describing the sands and gravels at Waterbeach (Grid ref. SU 895985) was the first to identify that marine sediments had been laid down at the northern end of the coastal plain at elevations now close to 40m above sea-level. In a later paper, he presented further observations and correlated the deposits he interpreted as 'raised beach' sequences in Sussex with similar deposits elsewhere in Southern Britain (Prestwich, 1892). This was the scenario that existed when Heron-Allen was active in the Selsey area. However, by the 1920's knowledge had been accumulated that allowed scientists to recognise that more than one high sea-level event was preserved in the area (Palmer & Cooke, 1923; Fowler, 1932; Calkin, 1934). Since then the discoveries at Amey's Eartham Pit, Boxgrove (Roberts, 1986; Roberts & Parfitt, 1999) and the work of the author (Bates *et al.*, 1997, 2010) have demonstrated that the record is even more complex.

Today we know that the Selsey area preserves a particularly important record of finds from the channels that surround the town and have been seen at low tide since at least the time of Dixon (1850). These channels (that are still not adequately understood) are today largely inaccessible due to the construction of sea defences and the state of the beaches. However, they preserve within their form rich records of mammalian remains, plants, molluscs and other fossils that all document former periods of prehistory of Selsey Bill (West & Sparks, 1960; West *et al.*, 1984; Whatley & Kaye, 1971; Parfitt, 1997; Bates *et al.*, 2009). It is this

record that Heron-Allen investigated on a number of occasions and to which we now turn in our story.





KEY
♦ Goodwood/Slindon Raised Beach + Aldingbourne Raised Beach
● Brighton/Norton Raised Beach ▲ Pagham Raised Beach ■ Cold Stage Sites
Interglacial Channels

Fig. 1A. Site location plan. *1B.* Selsey and the Sussex/Hampshire Coastal Corridor. *1C.* Selsey and the Manhood Peninsula.

FIELDWORK IN THE INTERTIDAL ZONE AND ACROSS THE MANHOOD PENINSULA

Today fieldwork within the intertidal zone is acknowledged to be one of the most challenging situations in which we can work

Epoch	Marine Isotope Stage	Marine sediments	Channel deposits	Palaeogeographic condition
Holocene	1			
Late Pleistocene	2			
	3			
	4			
	5a-d			
	5e	Selsey Ridge Pagham Formation (Pagham Raised Beach)		Fully open English Channel. Isle of Wight/mainland ridge breached by sea, truncated Solent system and modern tidal patterns established.
Middle Pleistocene	6			
	7	Norton Formation (Brighton/Norton Raised Beach) Aldingbourne Formation (Aldingbourne Raised Beach)	West Street Channel Lifeboat Station Channel ? East Wittering Channel	Fully open English Channel. Major Solent Estuary.
	8			
	9	?	? East Wittering West Wittering Channel	Open English Channel for part of interglacial. Major Solent Estuary
	10			
	11	?	? Earnley Channel	Open English Channel for part of interglacial. Major Solent Estuary.
	12			Channel ridge breached
	13-16	Slindon Formation (Goodwood/ Slindon Raised Beach)		English Channel closed. Major Solent Estuary.
	17-19			

Table 1. Stratigraphic table for the study area of the West Sussex Coastal Plain. Shading indicates interglacials.

because of the nature of the problems facing us. Difficulties exist in terms of access to the exposures at low tide, the problems of water seepage, difficulties of recording, the restricted time during which the exposures are accessible, and the temporary nature of exposures. Similar problems were of course extant in the past and Heron-Allen was all too familiar with these challenges. For example, he notes (in *Selsey Bill: Historic and Prehistoric,* p. 37) that....

> "....it is particularly trying to find what we know to be a rich fossil bed, covered with a layer of sand, perhaps only an inch or less in thickness, but which renders anything like an examination of the beds quite impossible."

This problem was particularly acute during the visit on 9th July 1904 of the Geologists' Association to Selsey when both the exposures at the Park Beds and Medmerry Farm were covered up leading Heron-Allen (1911) to note in *Selsey Bill: Historic and Prehistoric* (p. 37) that "the excursion was a complete fiasco". A similar visit by the Quaternary Research Association in 2009 (Figure 2), during their Annual Field Meeting, anticipated such problems and chose only to view the gravel cliffs north of West Street rather than attempt to access the foreshore and the buried channels beneath the beach.

Fig. 2. West Street, Selsey. Low cliffs north of West Street with party of Quaternary scientists visiting in Spring 2009 on the annual Quaternary Research Association field trip.

Other difficulties of operating within such a public domain were illustrated by the discovery of the bones of a 'mammoth' to the east of the Bill at the Lifeboat Station in March 1909. This discovery prompted huge local interest. However, as Heron-Allen (1911) notes (in *Nature and History at Selsey Bill,* p. 15) this publicity resulted in....

> "....the entire population of Selsey fell upon them like one man and a boy (in the hope of gain).... Professor Gregory, Dr A Smith Woodward and myself were present at this barbarous demolition."

This concern with the manner of the recovery of the bones is notable and Heron-Allen (1912) goes on to describe how they were able to recover some of these bones for the Natural History Museum in London. It is also notable the scrapings of the sediment on the bones were processed for their plant remains and a species list was provided that included Water Crows-foot, Spike Rush, Horned Pond-weed, Sedges and Pond-weed, leading to the conclusion that the environment was one of freshwater in a small lake or the edge of a river.

Fig. 3. Excavations at the Lifeboat Station Channel in 1961 under the supervision of Anthony Sutcliffe of the Natural History Museum, London.

Thankfully a similar discovery in the early 1960's resulted in an entirely different local response when a team of locals and scientists descended on the discovery of a straight-tusked elephant and rhinoceros at the Lifeboat Station (Figure 3 and 4). This time the discovery was excavated methodically and meticulously and the results now repose in the Natural History Museum in London.

Finally the most appropriate way to record temporary exposures within the inter- and supra-tidal zone has been one that has taxed many Quaternary scientists and archaeologists. Heron-Allen deployed a novel approach for the early 20th Century to recording the cliff section at West Street where he commissioned one of the first uses of multiple photographs joined together in a photomosaic image to document the section. The pictures were taken on the low cliffs north of West Street when gales in the autumn of 1910 stripped the beach in front of the West Street cliffs down to the basal lug sand. This opportunity allowed Heron-Allen to persuade Hilda Ayling to photograph the cliffs which now stood exposed to a height of 16 feet. The results of her work was the photomontage on which a section was drawn of the sequence in the cliffs. Although we do not know the precise location of this section the similarity to a recently recorded photomontage is striking (Figure 5).

Elsewhere across the Selsey area we know that H-A was recording, wherever and whenever he could, the Pleistocene succession. He notes in 1911 in *Selsey Bill: Historic and Prehistoric* (p. 36) that....

> "....we have furthermore made a point of measuring all gravel pits, surface wells, and drainage pits that we have known of, or have been made in the Parish of Selsey, to a depth of 25 feet during the last 4 years"

Unfortunately his primary archive of this endeavour is now missing but as a result of this work he was able to suggest that the gravels are typically 12-14 feet (3.6-4.2m) thick and overlie lug sands of 10-12 feet (3.0-3.6m) in thickness. Using his data and given a surface elevation on average of approximately 7.5m O.D. and as we know that about 1.4m of brickearth cap the deposits, we

Fig. 4. Skull and tusks of a straight-tusked elephant under excavation at the Lifeboat Station Channel.

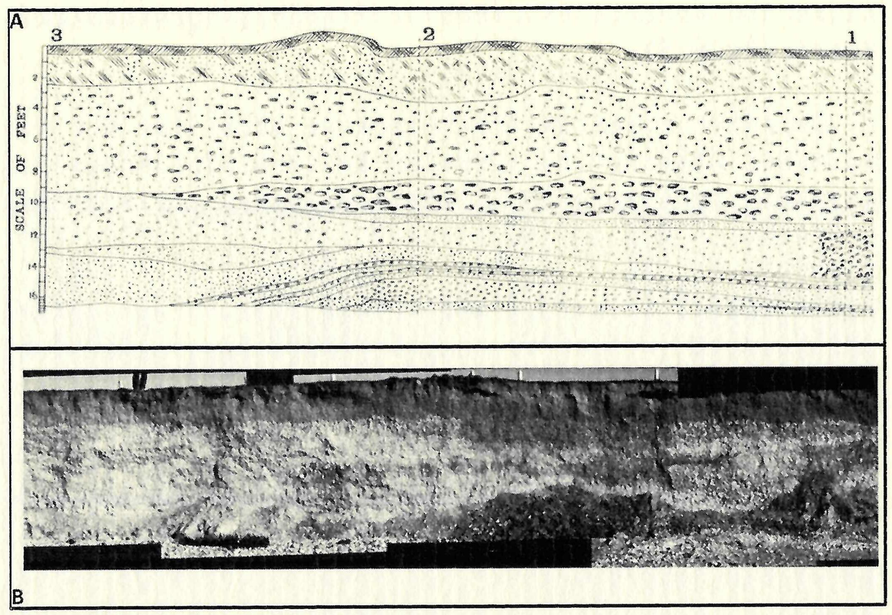


Fig. 5. West Street cliff sections. *5A.* Section drawn by Heron-Allen from Hilda Ayling's photomosaic of the cliffs. *5B.* Modern photomosaic of cliffs north of West Street by the author.

can therefore use his information today to suggests the base of these deposits (which we cannot see at the present time) lies between -0.5m and -1.7m O.D. One such section that he would surely have recorded was exposed in the Trojan Brick Company pit at Selsey Bridge Halt (Figure 6); none the least because he also had an active interest in the Selsey Tramway from Chichester to Selsey, being company Vice-Chairman at the time.

SELSEY PLEISTOCENE GEOLOGY: PAST AND PRESENT

The history of the investigation of the Pleistocene geology of Selsey Bill (Figure 1) has been one of intermittent investigation over at least 150 years since Dixon (1850) described the finding of a jaw of a straight-tusked elephant *Palaeoloxodon antiquus* (wrongly described as a mammoth) from the western coast of the peninsula. It is possible this find was made close to the fossiliferous channel we now call the West Street Channel (Bates *et al.*, 2009) that is described in more detail below. These early investigations were followed by work by Clement Reid (1892) who described the erratic boulders in front of the low gravel cliff in the vicinity of Medmerry Farm (Figure 7) while more recently West & Sparks (1960), West *et al.* (1984) and Whatley & Kaye (1971) have described sequences from the Lifeboat Station and Earnley.

To the author's knowledge the first detailed published map

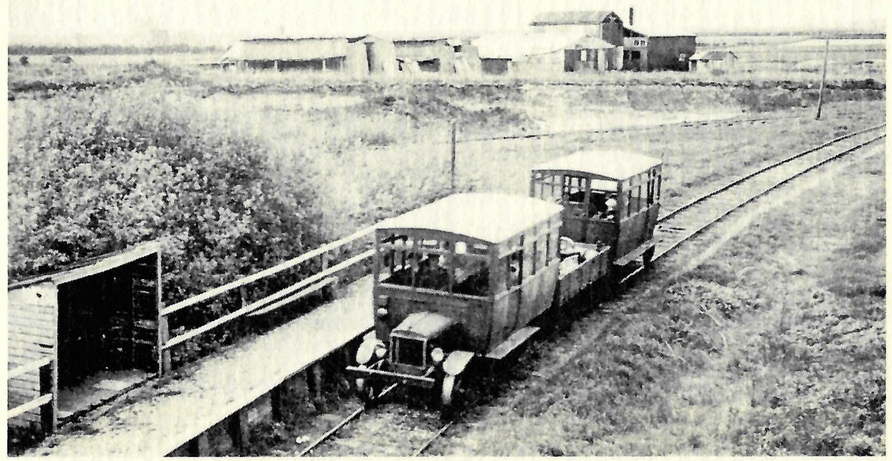


Fig. 6. The Shefflex railmotor of the Selsey Tramway at Selsey Bridge Halt around 1933 showing the Trojan Brick Company pit in the background.

showing the distribution of the channel deposits around Selsey Bill was published by Heron-Allen in 1912 and this usefully shows the main deposits that we know today. His observations describe the basic sequence that in essence consists of two basic elements:

1. The marine gravels overlain by brickearth which were noticeable in the low cliffs around Selsey (Figures 5 and 7), and
2. The fossiliferous deposits exposed at low water level and usually covered by beach sand (Figure 8).

It is unlikely that Heron-Allen (or indeed any geologist who has reported their observations) saw these two sets of deposits in direct stratigraphic context although it has long been recognised (if not explicitly stated) that the fossiliferous foreshore sediments are likely to run under the gravels exposed in the low cliffs. The closest that anybody within living memory has been to such an observation was during the recent failure of the sea defences at West Street (Figure 9) when the sea wall collapsed revealing a

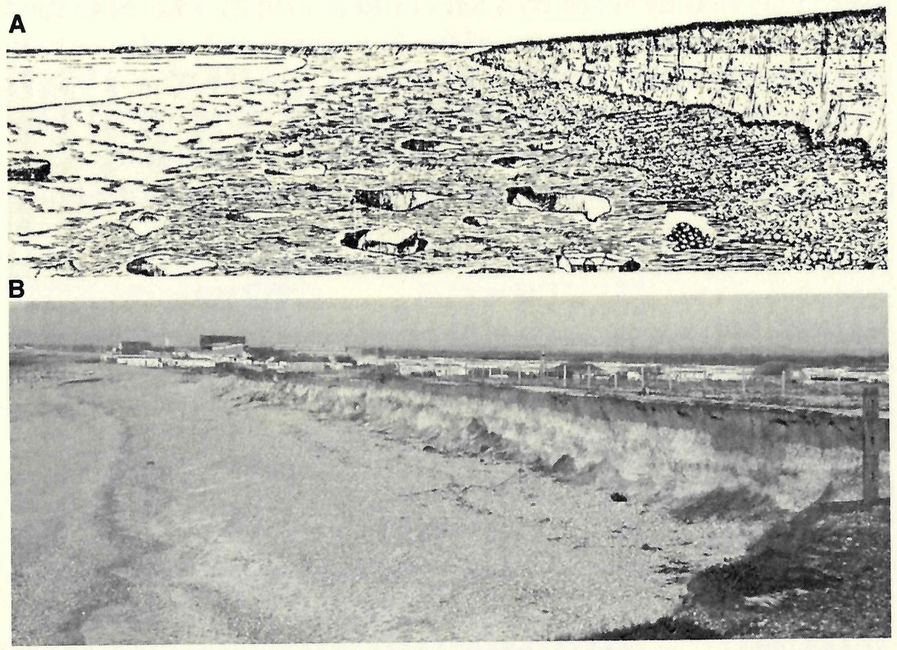


Fig. 7. Coast between West Street and the former site of Medmerry Farm. *7A.* drawing from Clement Reid (1892) showing low cliffs backing surface of Tertiary sediments containing scour pits with erratic blocks. *7B.* Low cliffs with marine sediments extending north from West Street in 2003.

complex sequence of beach gravels similar to those described by Heron-Allen in the vicinity (Figure 5) and where we know from fieldwork (see below) that a fossiliferous channel lies beneath the modern beach sand and at the foot of the collapsed defences.

The fossiliferous channel deposits (that have long been the target for collectors) have continued to yield mammal remains throughout the 20th Century and important contributions to our knowledge of these deposits have been made by Stinton (1985) and more recently by Bone & Tracey (1996). Material has also been collected by locals such as Roy Fowler and more recently, Storm Dunlop collecting on an intermittent basis. Heron-Allen described many of these channels in 1912 (p. 18) and specifically notes that....

> "....from West Street to 100 yards south-east, boulder and flint beds, [occur] both at low water and between tide-marks. Just above the blue clay is a band of yellow-brown clay (boulder clay) with many broken shells. Below the blue clay, at low-water mark, a flint bed in which Mammoth teeth are not

Fig. 8. Excavation of southern side of West Street Channel in 2003. Darker sediments represent estuarine sediments infilling channel. Lighter sediments below the staff are the Tertiary bedrock into which the channel has cut.

uncommon. It was from this bed that Dixon obtained his Mammoth skull and teeth. Between tide-marks above the yellow and blue clays is the "Blue Band" patch, twenty yards long by six feet broad, of bright indigo blue (very seldom visible), full of highly pyritized Mollusca and Foraminifera. Probably the "Selsey Beds" of Mr. Clement Reid, marked upon his MS. map of Selsey Bill, preserved in the library of the Geological Survey in Jermyn Street".

However, it was only with the interest of Richard West (of Cambridge University) in the late 1950's that serious attempts to investigate and publish evidence from these channels was made. The result of these investigations were publications from the Lifeboat Station channel on the east side of Selsey Bill (West & Sparks, 1960) and the Earnley channel (West *et al.*, 1984) on the west. However, one site that seems to have been overlooked throughout the 20th Century is a location from which Heron-Allen did collect at the end of West Street on the western side of the Bill

Fig. 9. Failed sea defences immediately south of West Street in 2008. Raised beach sediments are present in section, light grey sediments at the base of the section are probably equivalent to the lug sands noted by Heron-Allen elsewhere in the Selsey area.

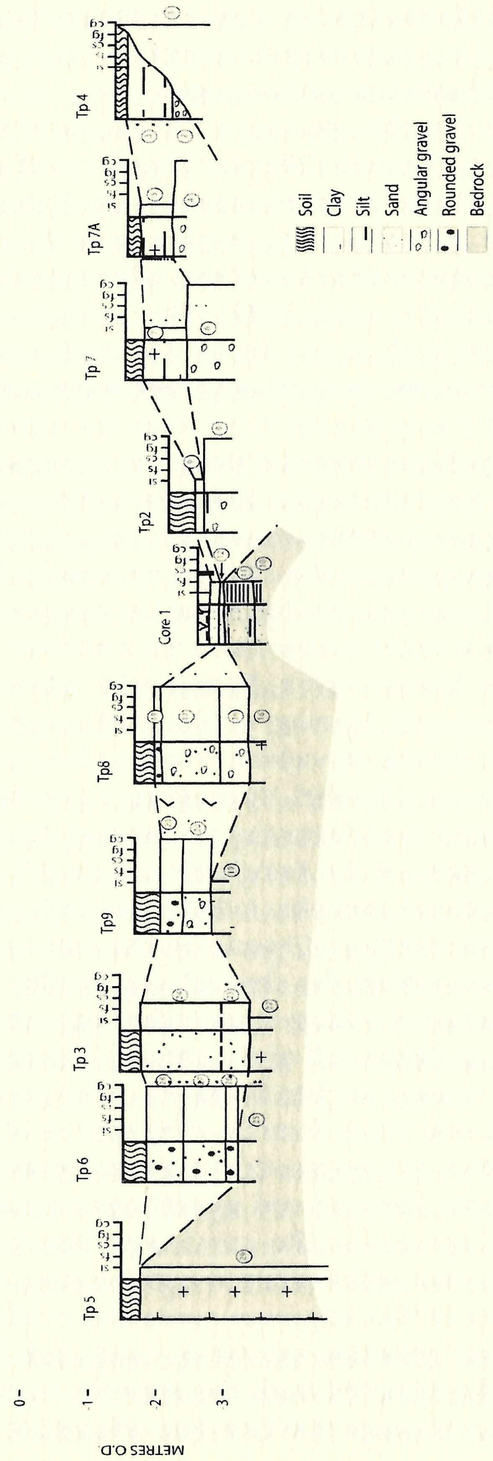


Fig. 10. Section through the West Street Channel showing marine sands in test pits 3, 6, 8 and 9. Black gravel (similar to that described as producing mammoth teeth by Heron-Allen) occurs in test pits 2, 4, 7 and 7A. Estuarine sediments are present in test pits 4, 7 and 7A.

south of the farm at Medmerry. Although the site has been known to local collectors for a considerable length of time no detailed publication has been available until recently.

Today we know that this channel at the end of West Street is complex and that at least two different sequences of sediments infill the channel (archival information held at the Natural History Museum in London indicates perhaps even more deposits were formerly exposed in the area but have been subsequently removed by marine erosion) (Bates *et al.*, 2009). The northern section of the channel is filled with sands up to 2m thick that contain abundant mollusc remains. Surprisingly these were not recorded by Heron-Allen and it may be that these were not exposed at the time. The marine molluscs from the sands are a diverse group of gastropods and bivalves found either in littoral habitats, mostly low in the shore zone, or in immediately sub-littoral conditions. Many marine molluscs that occur in the channel are widely distributed geographically at the present day but some are more restricted in their ranges. The West Street marine fauna has a number of species (*e.g. Ostrea edulis, Venus casina, Ensis ensis*) whose modern northern limit is in south Norway or Denmark suggesting that water temperatures during deposition of the sediments were no colder than the present Channel. By contrast a number of both bivalve and gastropod taxa from the assemblage have modern distributions in the west of the British Isles, in the SW Peninsula and southern Ireland and probably indicate the influence of the warmer waters of the western Channel in the past as well as at present. Also present within the channel, and familiar to Heron-Allen, are an association of marine foraminifera and ostracods.

By contrast the southern half of the channel (Figure 8 and 10) contains clay-silts resting on black gravels. The molluscs are typically brackish-loving types dominated by species of *Hydrobia*, while the foraminifera and ostracods suggest the presence of an intertidal environment. The ostracod assemblage contains no less than five "southern" species. At the very lowest tidal levels a thin sequence of organic-rich sediments was noted resting on gravels. The uppermost part of this sequence contained evidence for *in situ* rooting of slow growing oak trees. Land and freshwater molluscs are found associated with the uppermost part of this sequence. Climatic reconstruction based on what is a very limited

collection of molluscs cannot be exact, but the molluscs include *Vertigo angustior* and *V. antivertigo* that have present distributions which reach only as far north as southern Sweden indicating terrestrial conditions no colder than Sussex today. What is clear from the recent work at West Street, that has examined both the collections held by the Natural History Museum and new sections exposed in the field, is that the sequences are complex. It is likely that Heron-Allen saw exposures in the channel further seaward than those that we sampled recently and consequently there is probably no precise match for those deposits he described in 1912 with those reported by Bates *et al.* (2009).

MARINE GEOLOGY AND COASTAL CHANGE

Anyone living in Selsey is aware of the patterns and processes of coastal change that have affected the area and Heron-Allen was no different. The importance of coastal change was remarked on by Heron-Allen in 1912 (p. 12) where he states that...

> "It must be borne in mind that the shoreline today is vastly different to what it was at the beginning of the Historic period."

He illustrates this change in his map accompanying the 1912 Guide to Selsey where the position of the coast is plotted in 1672, 1820, 1896 and 1909. Using this information for the West Street area the retreat of the cliffs can be calculated to be in the order of 316m over the 237 years separating the first and last plotted coastline. This suggests a retreat rate of approximately 1.3m per year, and for the West Street Channel this would indicate that Heron-Allen's observations may have been some 120m seawards of those made in fieldwork in 2003 when the author investigated the site.

However, elsewhere in his writings he seems to have forgotten the impact of such change. For example, when discussing early humans in Selsey he writes (in *Nature and History of Selsey Bill*, p. 12), implying a geography similar to that of recent times....

> "...but, in the period represented by the flints a very important – shall we say- Person?- arrived..... We can imagine him, with the attractive female of this species, and his more than

promising young, sheltering from our Selsey Sou-westers in any convenient cave of our peninsula."

Since Heron-Allen's time the construction of sea defences has largely limited the impact of coastal erosion although it is interesting to see that the recently major failure of the coastal defences occurred at West Street (Figure 9) where part of the sea wall had collapsed. The link here between coastal engineering and Quaternary geology is a significant one. Engineers repairing this collapse were totally unaware of the presence of a channel cut into the foreshore at this point. The importance of this subterranean channel through which ground water must move on a regular basis was not, however, lost on them and once in command of all the facts, immediately set about re-designing the repair as the reason for the collapse was probably down to the presence of this feature in the first place. One wonders whether better discourse between the amateurs and professionals in Heron-Allen's day might have prevented such a near mistake!

Finally, attention should be drawn to the importance not only of the terrestrial geology but also the submarine geology of the region. Today the significance of offshore geology for understanding coastal processes, etc. is well demonstrated and archaeologists and Quaternary scientists are also now aware of the importance of this area. Heron-Allen had demonstrated his understanding of this importance as early as 1911 when he stated (in *Selsey: Historic and Prehistoric*, p. 46)....

> "A sketch of the geological history of Selsey Bill however slight, as this must necessarily be, would be incomplete without a reference to what may be called its submarine geology, which is, in some respect, unique, and which has, and must always have, a powerful influence on the history or development of Selsey."

Today links between the marine and terrestrial sector are acknowledged and indeed the author has examined these links within the Sussex/Hampshire coastal area in a recent publication (Bates *et al.*, 2007).

DISCUSSION

Having examined the legacy left by Heron-Allen to the study of Quaternary geology and palaeontology in the vicinity of Selsey it is clear that his contribution was significant and an important one in the history of research in the area. However, when we think about his impact it is perhaps important to also consider the role played by a number of other local amateur geologists and palaeontologists both during Heron-Allen's time and more recently. Many of the observations made by Heron-Allen were based on the work of others including the Rev. Osmond Fisher as well as the aforementioned Dixon. Heron-Allen received a significant body of information collected by the Rev. Cavis-Brown, the late vicar of Selsey. Furthermore his collecting was aided by the very detailed knowledge of Mr William Woodland, the tenant farmer of Medmerry Farm and his son Thomas. Consequently, our depth of knowledge is in no small part due to these individuals whose persistence over many years provided the detailed knowledge on which Heron-Allen's published records are based. Since then many others included Roy Fowler and Storm Dunlop have continued this tradition of collecting. The significance of these individuals' work may not necessarily be highlighted by stunning discoveries or monumental scientific works but it is by their accumulated knowledge that their enterprise has contributed to the sum of the record for the region. Working today in the early 21st Century we rely on these observations, comments (sometimes seemingly trivial) and collections that past workers have left us through published reports, letters, field notebooks or scrawled comments on manuscripts and maps. This information can be invaluable and sometimes can unlock mysteries of our archives. This is perhaps the importance of Heron-Allen's observations to us today.

We can also see that through his archive he fully appreciated the importance of detail. The fact that he attempted to record gravel exposures in Selsey to provide an overview of the sediments is one such example. At other times, of course (as was common at this time), he was given over to flights of fantasy as his description of an early occupant of Selsey suggests (see above).

The extent of his archive as held in the West Sussex Record Office in Chichester also hints at further useful information that may exist within the remainder of his archive. Because it was split

up after his death parts of this (such as his records of the gravels across Selsey Bill) remain to be accounted for and it is hoped that one day these might see the light of day.

ACKNOWLEDGMENTS

The author would like to thank Dr John Whittaker for help in so many areas of his research into the Quaternary history of Sussex. I would also like to thank Su Bates, Philip Gibbard, David Keen and Simon Parfitt who participated in one way or another in the investigation of the West Street site, as well as Tim McCann and the staff of the West Sussex Records Office for help in searching the Heron-Allen archive.

FOOTNOTE

[1] The Quaternary is subdivided into two epochs: the Pleistocene (over 2m years to *c.*11,500 years ago, a period of great climate change of temperate interglacials and cold periods in Northern Europe), and the Holocene (our present interglacial, *c.* 11,500 to today).

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EDWARD HERON-ALLEN, L.F. SALZMAN AND 'THE MOUND' AT SELSEY, 1911

by TIMOTHY J. McCANN

Edward Heron-Allen lies buried at the northern end of the graveyard at Church Norton, a hamlet bordering Pagham Harbour at the north eastern corner of the parish of Selsey in West Sussex. I always think of Church Norton as a slightly eerie isolated place, perhaps less so since the rows of trees bordering the B2145, the long lonely road from the Chichester to Selsey, came down a few years ago. My impression was strengthened when I taught a class on 'An Introduction to Local History' in Selsey in the winter of 1973 and one of the sessions turned into an impromptu telling of local legends and ghost stories almost all of which were located round Pagham Harbour and Church Norton in particular. The road to Church Norton ends at the chancel of the old Selsey Church and Norton Priory, once the old vicarage, and between them is situated 'The Mound'.

As is the case with many seaside towns and villages, there are a number of myths and legends attached to Selsey in West Sussex. Two of these myths relate to the idea that the ancient cathedral of Selsey, the forerunner of Chichester Cathedral, is to be found under the sea off the southernmost tip of Selsey Bill, and the belief that the celebrated 'Mound' at Church Norton was built as the foundation of an Armada beacon. Edward Heron-Allen, who built a house at Large Acres in Selsey in 1906, initially for the benefit of his daughter's health, quickly took an interest not just in the foraminifera of the peninsula, which resulted in the publication of eight scientific papers in association with Arthur Earland in the *Journal of the Royal Microscopic Society* between 1908 and 1911, but in the archaeology and local history of the area.

One of the first things Heron-Allen did when he started to develop his property at Large Acres, just off the High Street in Selsey, was to set up a meteorological station, and the meteorological records he kept from 1908 to 1923 are also among the collection at the West Sussex Record Office in Chichester. As soon as he had settled in the peninsula, Heron-Allen began to take an active part in the study of his local community. From the start

he began to collect fossils and coins as well as foraminifera, and encouraged the locals to bring their own discoveries to him. In 1909 he joined the Sussex Archaeological Society and became an active local secretary of the Society for Selsey and in that same year, he contributed his first paper to *Sussex Archaeological Collections* on a collection of Roman coins found in Selsey in 1909. Two years later he joined the Sussex Record Society, and remained a member of both societies until his death in 1943.

Next he set about writing the history of Selsey. In this he was greatly helped by the researches of then Vicar of Selsey, John Cavis-Brown, who had been collecting material for several years and intended to write a history of the whole peninsula. Heron-Allen had already promised to co-operate with Cavis-Brown on the scientific and pre-historic part of the history, and when the Vicar died in 1909, Mrs. Cavis-Brown presented his unfinished work and all the material her husband had collected to Heron-Allen. Co-ordinating his own researches, Cavis-Brown's notes and Mary Salmon's researches in the British Library and the Public Record Office, Heron-Allen published his monumental 400 page *Selsey Bill: Historic and Prehistoric* in 1911.

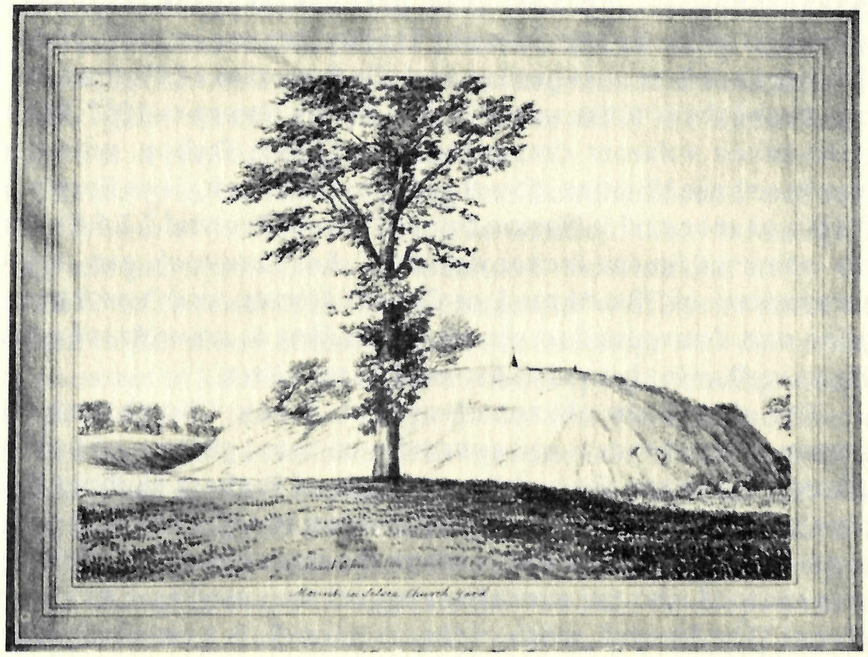

Fig. 1. The Mound' in Selsey churchyard in *c.* 1791, by S.H. Grimm.

Immediately before the publication of his magnum opus in 1911, Heron-Allen published *Nature and History at Selsey Bill: A Lecture delivered in London on the 17th of January and in Chichester on the 4th. February 1911*, and the *Visitors Map and Guide to Selsey*. Then, in the 1930s, he published his *Guide to the Parish Church of St. Peter on Selsey Bill*. As the local secretary of the Sussex Archaeological Society and in the pages of its transactions he published articles on some Roman imperial coins found at Selsey in 1909, and a series of other finds over the next thirty years, most notably the celebrated Selsey hoard in 1932, the Selsey map of 1672, and on the Selsey Volunteers. Towards the end of his life, in partnership with Harriet James, he published articles in *Sussex County Magazine* on subjects as various as Treasure Trove in Selsey, the Sussex Martlets, the Long Man of Wilmington, Ecclesioclasm in Sussex and the early Chichester Guide books. But he was not just a writer on archaeological subjects.

Six volumes of miscellanea relating to his history of Selsey, compiled by Heron-Allen, and containing his notes, photographs of many of the documents and artefacts that he used; his correspondence with fellow scientists, archaeologists and antiquarians, and another fine selection of postcards, were presented to the Record Office by Lindsay Fleming in 1957. Lindsay Fleming, a fellow antiquarian and the historian of Pagham had purchased them at the sale of Heron-Allen's library in 1957. These miscellanea volumes document how Claude Bishop, who had purchased the Vicarage after the death of the Rev. Cavis-Brown in 1902 and renamed it Norton Priory, Heron-Allen and L.F. Salzman, the editor of *Sussex Archaeological Collections*, took part in the excavations of 'The Mound' at Church Norton, and how Heron-Allen was determined to get his hands dirty in an archaeological dig as well as in the search for local foraminifera.

The site of the thirteenth-century Selsey Church and the nearby 'Mound' was a comparatively elevated plateau of land at Church Norton at the south-west angle of Pagham Harbour. The nave of the church had been pulled down in 1876 and re-erected some two miles further south where the main settlement of Selsey was situated, and the surviving chancel was used as a mortuary chapel. 'The Mound', south of the old church, is a circular or oval earthwork consisting of an inclosing mound rising to the height

of 9 feet above the surrounding surface and a ditch descending to some 18 feet at the bottom. The wall of the churchyard cuts across the earthwork from west to east and the northern half was clearly levelled to extend the churchyard.

At the time that Heron-Allen moved to Selsey and indeed when Claude Bishop purchased Norton Priory the earthwork looked eastwards over fields and streams towards the distant sea at Pagham, but on 16 December 1910 the sea reclaimed the harbour, bursting its way over the reclaimed farmland and artificial waterways so that at high tide the sea flowed close to the foot of the church plateau as it did in the Middle Ages. The earthwork was revealed as a prominent feature both for the defence of the harbour mouth and as a natural landing place. Antiquarians had long puzzled as to the date of the earthwork and its purpose, and Heron-Allen was no exception.

Claude Bishop first raised the subject of 'The Mound', but it seems to have been Salzman who took the initiative in proposing an investigation. On 1 November 1909 he asked Heron-Allen... "do you know anything of Norton Priory - Selsey - & the earthworks there. I had a letter from Mr. Bishop of that place some time since, referring to certain earthworks on his land as possibly Roman - are they embankments, or what?"[1]. Heron-Allen's reply does not survive, but he obviously briefed Salzman, because a week later, he wrote again: "thanks for the information about the earthwork. I hope that it may be properly examined"[2].

At the time, the latest thinking was that 'The Mound' was built for a beacon at the time of the Spanish Armada. Alfred Rusbridge, a local antiquary, published a book entitled *The Mound at Selsey Old Church. An Incident of the Armada: together with a brief historical sketch of the Selsey Peninsula* in 1900. Rusbridge was the author of a number of local books, many on bee-keeping, including *A Book for Bee-Keepers*, 1875; *Bee-Keeping Plain and Practical: and how to make it pay*, 1883; and *Sussex Old World Bee-Law*, but he also wrote about local history, including *Old Pagham Harbour*. He was fascinated by Pagham Harbour and his detailed correspondence with Claude Bishop between 1911 and 1918 covering such topics as the changing shape of Pagham Harbour, the developments at Church Norton, and local history and natural history in the Manhood Peninsula is now preserved in the West Sussex Record

Office[3]. It may well have been that correspondence that persuaded Claude Bishop to plan an excavation of 'The Mound'.

Heron-Allen set out his thoughts on the matter in his published lecture, *Nature and History at Selsey Bill*, early in 1911. He argued that the Selsey church at Church Norton was the site of St. Wilfrid's Cathedral using as his evidence the painting on the wall of Chichester Cathedral. "This was painted in 1519 for Bishop Sherburne, by Bernardi, a Flemish artist", he wrote, ..."and it's great interest for us lies in the fact that in the north-east corner, you may see a representation of Selsey Church, as it was at that date, with the entrance to Pagham Harbour behind it, as it was in the 16th century, and – as it has been since Christmas 1910" [4]. And he maintained that Norton Priory was the site of St. Wilfrid's monastery. "There seems no doubt' he argued, "that Norton Priory ... stands where the original Priory of Secular Canons was established by Wilfrid".

Salzman was quick to respond. "I take the opportunity of making some comments on your interesting lecture", he wrote. "I can see no reason for believing that the Saxon monastery was on the site of the Old Rectory – it must surely have adjoined the Cathedral; also the inhabitants of Wilfrid's foundation were not secular canons but Benedictine monks under an abbot". He concluded..."I am urging Mr. Bishop to excavate his earthwork, but have had no reply" [5].

We first hear of his plan in a letter Salzman wrote to Heron-Allen on 11 March 1911, when the initial idea of Bishop's was that the site might be Roman. The letter touches on some of the ideas of the excavators at the time. "Mr Bishop told me", Salzman wrote, "that there were some Roman bricks in his house & he took me round it, but I could not see anything suggestive of very early date. Still you may be right about the Cathedral having been near the Parsonage – though you have a fair old tradition of it being out to sea against you. If it was on the site of the church we may find some traces of it as I gather from a letter received from Mr. Bishop that he hopes to excavate his earthwork, with your assistance, in the Spring ... If I manage to get down to Selsey for the exploration of the entrenchment, I shall try to do so" [6].

The two men began to search the written sources on 'The Mound'. Writing in his *Selsey Bill* in 1911, Heron-Allen noted that

"a writer in *The Gentleman's Magazine* in 1824 declared it to be a Danish encampment, and it is not mentioned at all in the *Victoria County History*" [7], and during the excavation he wrote to Salzman that in the "travels of Dr. Richard Pocock", which he had been reading, there was a report that "there are remains near the church of a large tower, which fell down in the memory of man, & of a fortified place, which was probably the Bishop's House" [8].

On 11 April 1911, Salzman wrote to Bishop: "I think we were pretty well agreed as to the best place to start operations? Making a rough sketch from memory it was about where I have indicated. I should suggest that the cut through the bank might be made about ten ft. wide, the trenches through the ditch & towards the centre of the enclosure being 5ft. If you could get your men just to take off the turf on the proposed line before I come down we could start straight off with the digging. Of course the section through the bank & ditch is the most important, but I should be inclined to work backwards into the central area as well. I will try to make arrangements for additional supervision. What about photographs? The site ought to be photographed before and during operations. I will bring my own camera down in any case. Do you know if I could get a room anywhere nearer than Selsey village?" [9].

On 28 April he wrote again: "I wish I could run down on Saturday next but it is such a beast of a journey for a single day. I shall await your report with much interest" [10]. The excavation must have been progressing well because Salzman was already planning to give a report to the Society of Antiquaries. "I shall have somehow to run down again before reading my paper at the Antiquaries", he continued. We don't know where Salzman stayed - he may even have stayed with Heron-Allen at Large Acres: certainly he visited the house and, on 12 May 1910, he recorded in the Large Acres Visitors Book: "The views at Large Acres are extensive, but they are limited compared with the realms of knowledge of the host, both are cribbed, cabined & confined compared with the charms of the hostess" [11], and despite her charms sent Mrs. Heron-Allen some money for his laundry - but we do know that Claude Bishop with the assistance of L.F. Salzman and Heron-Allen excavated 'The Mound' between April and July 1911.

Two of the excavators published reports of the their findings. Heron-Allen noticed the dig in his *Selsey Bill* published the same

year [12]. He described the excavation, and illustrated it with a plan and concluded that 'The Mound' was artificial and that the digging of the ditch and heaping up of the vallum gave the mound the appearance of height, and in the centre of 'The Mound' was found a platform of mixon rock probably forming the foundation of a wall, whose surrounds suggested a building of some importance. He concluded that it was a Roman Lookout Station guarding the entrance to the harbour and described the finding of two kitchen middens. Salzman, in a later article published in *Sussex Archaeological Collections* [13], suggested that the vallum could not be earlier than the fourteenth century and that a fragment of cream coloured pottery with red painted decoration of apparently the sixteenth century pointed to the sixteenth century. "Putting the evidence together", he wrote, "it seems quite clear that local tradition, as embodied by Mr. Rusbridge in his pamphlet, *A Legend of the Mound*, is - for once - correct, and that the vallum was thrown up and the moat dug at the time that the Spaniards were expected in 1587".

He went on to argue that while the defensive works were Elizabethan, the site had been occupied from early times. He did not speculate much about the building that had obviously stood there in medieval times and simply reported that the destruction was complete and that some of the stonework had been robbed for building the church or the churchyard wall. He ended his article by referring to Bernardi's picture on the wall of Chichester Cathedral that shows two buildings - one apparently meant for Selsey Church and the other an isolated tower occupying about the same position that the ruined wall bears to the church but concludes that "it would be unwise to attach much importance to this fanciful sketch".

In September Salzman responded to the publication of Heron-Allen's *Selsey Bill* with an amusing letter:

> "Dear Heron-Allen.
> 'Nos omnis notias': This memory shall live in your immoral - I mean, immortal work. Embalmed in the pellucid amber of your writing. Others have striven to attain immortality at their own expense. My 'monumentum aere perenius' has the advantage of being erected 'acre alieno':

> Future Biographical Dictionaries will have something of this sort - 'Salzman, L.F. Flourished early in the 20th century. Wrote apparently on antiquarian subjects. Mentioned several times in Heron-Allen's *History of Selsey*, otherwise unknown'. But perhaps, when you have read my devastating criticisms, you will expunge my name, or I shall appear only as 'the egregious Salzman'. Now to business" [14].

Salzman first made a number of criticisms of *Selsey Bill*. He queried Heron-Allen's dating of the Domesday Book, his

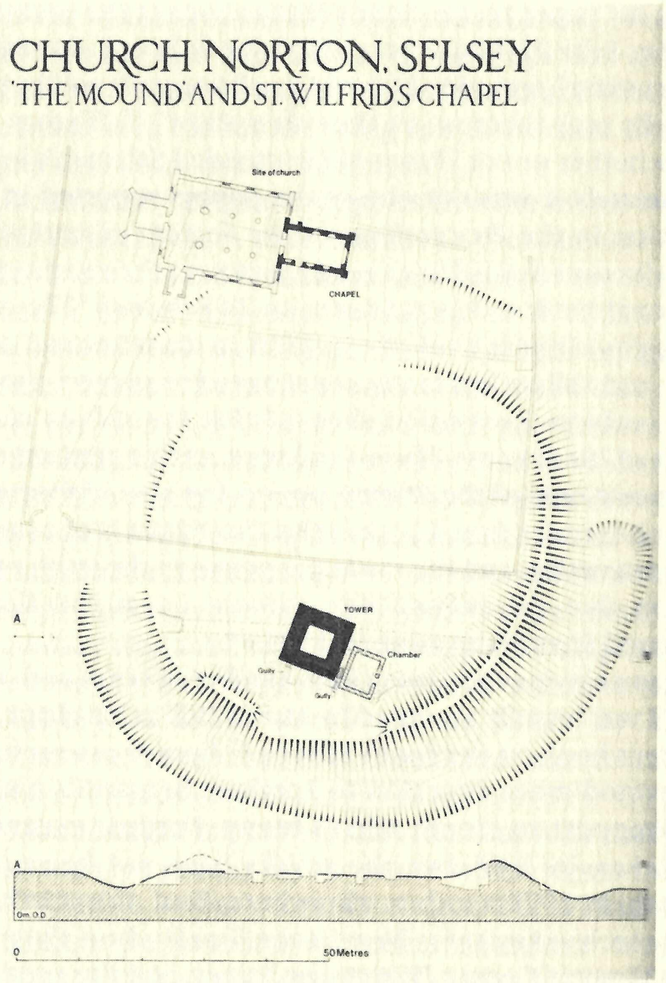

Fig. 2. Church Norton, Selsey. 'The Mound' at St. Wilfrid's Chapel (drawn by Fred Aldsworth).

description of the Hundred as the smallest unit of administration, and his account of the relative value of money, and he disagreed with his use of the word 'hide' and 'forest' in the context in which Heron-Allen used them. More interesting was what Salzman had to say about 'The Mound'...."As to the Mound. The vallum is of course artificial, but all over the surface of the mound we found undisturbed natural soil at about 2-3ft. This level, as a matter of fact, lines up pretty well with the lie of the land on the other side of the ditch, & the heading up of the vallum which has given the whole place the appearance of standing so high".

Salzman wrote to Heron-Allen on 2 September 1911: "I am reading my paper on the Selsey Excavations at the Antiquaries on Thursday, Feby 22; I hope you will come & hear it & contribute to the discussion", and added: "Could you bring your eoliths with you? We might tack them on to the other show" [15]. History does not relate whether or not Heron-Allen attended Salzman's lecture and unfortunately it was not one of the papers reported in full with discussion in the *Proceedings of the Society of Antiquaries*. But they did report that Salzman read a paper on the recent excavation of the earthwork at Selsey, Sussex on 22 February. "The earthwork is a roughly circular work about 250ft. in diameter, and consists of a ditch and vallum, evidently constructed to protect the entrance to the harbour. Excavation showed that the vallum rested on a deposit of black earth, 2ft. in thickness. As this stratum contained pottery, not only of the Roman period, but also of fourteenth and sixteenth-century date, it is clear that the vallum is of comparatively late construction, and the evidence points to the truth of the local tradition that the mound was thrown up at the time of the threatened Spanish invasion in 1588" [16].

Salzman's view held sway for a number of years, and, as recently as 1978 was broadly accepted by Martin Bell in his chapter in Peter Brandon's book on the South Saxons [17]. Recent research, however, has devoted more attention to Lambert Bernardi's painting and given support to Heron-Allen's views. Further excavation was undertaken in 1965 but the results have not been published. However, in 1979 another triumvirate, Fred Aldsworth, the then County Archaeologist for West Sussex, Tim Hudson, the then editor of the *Victoria County History for Sussex*, and the present writer, then of West Sussex Record Office, looked again at the evidence of

the painting and with the help of other printed sources rather altered Salzman's conclusions. Fred Aldsworth in an article in *Sussex Archaeological Collections*, vol. 117 [18], argued that there was evidence to support the idea that the buildings shown in Bernardi's painting did indeed represent Selsey Parish Church and a tower which probably dated from the eleventh century. He quoted a Letters Patent of 12 February 1580 which recited that: "there is in the saide Island of Selsey, one olde stone Steeple of a great height adioyning neere to the Sea, which of most auncient time out of mind and at present is a notable Sea-marke for all Merchants and Trauailers by Sea upon the South coast, from East to the West, and from the West to the East, wherby not onlie the said Maisters of Merchant Ships but also the Maisters of our Ships take principall marke for the auoiding the dangers of great Rocks and Shalles lying out tenne miles from the shoare, being one of the most dangerous places upon that Coast called the Shalles".

The documentary evidence suggests that the tower was used to hang the church bells. A churchwarden's Presentment of 1662 stating that "there was never a steeple belonging to the church (at Selsey), but a tower formerly belonging to a ruined castle, somewhat remote from the church, where the bells hunge, but it is latelie fallen downe, the bells preserved, and a new steeple now annexed to the church is allmost the fourth part finished". This structure for hanging the bells is also mentioned in documents of 1541 and 1579, when it was described as "in great decay". Fred Aldsworth concluded that despite the evidence found in Heron-Allen and Salzman's excavation of 1911, there could be little doubt that the surviving mound at Church Norton was the remains of an eleventh-century ringwork which once supported a square tower, the foundations of which Heron-Allen and Salzman discovered. He was less certain about the parish church, which lay in close proximity to the ringwork, but considered the relationship between the two. Since the bishopric was not moved to Chichester until 1075, he thought it possible that the ringwork might have been constructed to protect the structure which represented the remains of Wilfrid's seventh-century church. But Wilfrid did not build a church, he founded a monastery, where his exiled companions and others could establish a regular life. There was no cathedral, the surviving charters refer to Selsey simply as the place

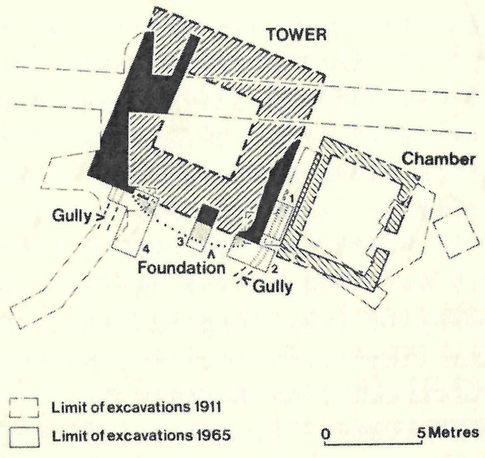

Fig. 3. 'The Mound', Church Norton, Selsey, showing the 1911 and 1965 excavations (drawn by Fred Aldsworth).

where the Bishop had his seat. The first churches were minster churches, which superceded the earlier monasteries, such as Bosham and Bishopstone and presumably Selsey cathedral was one of these, and Bishop William Reed identified Selsey church with the cathedral in his will of 1 August 1382 when he requested, "my body to be buried in front of the high altar in the chancel of the church of the Holy Trinity at Selsey, formerly the cathedral church of my diocese". But the surviving remains of the church appear to be of the early thirteenth century.

Two years later, Fred Aldsworth revisited the subject in a note published in *Sussex Archaeological Collections,* vol. 119 [19], this time in conjunction with E.D. Garnett, who had carried out the excavation of 'The Mound' in 1965. After re-examining the evidence provided by Heron-Allen and Salzman's excavation and the 1965 excavation, and particularly the finds now deposited in Chichester District Museum, they concluded that the main period of occupancy of 'The Mound' was from the mid-eleventh to the mid-

twelfth centuries, this supporting the suggestion that the earthworks were probably constructed in the Norman period and probably soon after 1066, and that the square tower probably dates to the same period and may be seen as a keep within a ringwork motte.

'The Mound' is now a Scheduled Ancient Monument (SAM), and is owned and managed by West Sussex County Council. Since the winter and spring of 2000/2001 a great deal of restoration work was carried out by Rob Carver, the Reserve Manager, with many volunteers. There seems little doubt that 'The Mound' at Church Norton is the remains of a small Norman castle. The County Council has now erected an information board featuring a reconstruction of how 'The Mound' might have looked. Edward Heron-Allen, buried with his wife and younger daughter Armorel a few hundred yards away from 'The Mound', would have been surprised by the amount of research his excavation almost a hundred years earlier has stimulated, and the conclusions it has reached.

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[3] W.S.R.O., Add. MS. 30,330.

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Opusculum I *Notes upon the Literary, Scientific, and Artistic Activities of Edward Heron-Allen, F.R.S.* Extracted from his Diaries and other Documents by Christopher Blayre (2000).

Opusculum II *Edward Heron-Allen.* A Talk delivered by his grandson Ivor E. Jones at the first Heron-Allen Symposium, West Sussex Record Office, Chichester, July 2001 (2001)

Opusculum III *The Quest for the Heron-Allen Society.* A Talk delivered at the first Heron-Allen Symposium, West Sussex Record Office, Chichester, July 2001, by Timothy J. McCann (2002).

Opusculum IV *"The Beauty and Mystery of the Foraminifera". The Foraminiferal Research of Edward Heron-Allen FRS, with an Assessment of his Scientific Career.* Based on a talk delivered on the beach at West Street, Selsey, to members of the Heron-Allen Society and guests of the West Sussex County Council, following the unveiling of a plaque in honour of Edward Heron-Allen by Ivor Jones, 15 July 2002, by Richard L. Hodgkinson and John E. Whittaker (2003).

Opusculum V *Reflections on Heron-Allen's War Journal.* Talks delivered at the second Heron-Allen Symposium, West Sussex Record Office, Chichester, July 2002, by Brian W. Harvey and Carol Fitzgerald (2003).

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delivered at the fifth Heron-Allen Symposium, The Allen Room, Dean Street, London, July 2005, by Timothy J. McCann, Joann Fletcher and Richard L. Hodgkinson (2005).

Opusculum IX *'Edward Heron-Allen and Music': Proceedings of the 6th Heron-Allen Symposium, 2006*, edited by Peter Horton. Talks delivered at the sixth Heron-Allen Symposium, The Royal College of Music, London, July 2006, by Brian Harvey, Pamela Thompson, Peter Horton, Joan Navarre and Garry Garrard (2007)

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