

◆ New archaeological recording on the beach at Medmerry, near Selsey, West Sussex

Peter Murphy
with contributions by
Peter Marshall
Irka Hajdas
Sanne W. L. Palstra,
Paola Ponce
Polydora Baker
James Kenny
Michael Lobb and
CDAS Coastal Monitoring
and Surveying Team

This report presents and interprets results obtained from shoreline monitoring and recording on the eroding shoreline of Medmerry, near Selsey, West Sussex, by the Chichester and District Archaeology Society (CDAS) from 2014 onwards. This is a community project which has received strong support from professional partners. The results show former land use and include Bronze Age burnt mounds, one of them including the base of a wattle fence; the Iron Age placing of a man's body on a wooden structure; stationary fisheries dating to around 1500–1650; land claim and drainage from at least the 17th century; the casting-up of wreck-related artefacts, probably in the 18th–19th centuries; drainage and farming, including hay production, in the 19th and early 20th centuries; recreational use in the inter-war years of the 20th century; military use in the Second World War and up to 1954. Coastal archaeological monitoring is an open-ended process that does not have a clear end date, so it is probable that further finds will be made in the future, as erosion proceeds. The involvement of CDAS has enabled rapid interventions for recording immediately after storms, which is rarely possible for a professional organisation. As a consequence, archaeological sites which would otherwise have gone unrecorded have been documented. Monitoring will continue.

INTRODUCTION

The coastline between East Wittering and Selsey is exposed and vulnerable to erosion (Goodburn 1987; Cracknell 2005, 145–148 and 153–160). Over the last 200 years sluices, coastguard stations and the farms of Medmerry and Thorney have been lost (Bone 1996 and *see below*).

Maintenance of the modern shingle bank is no longer continued, while the beach groynes are being allowed to collapse, or are being removed, as part of the Medmerry Managed Realignment Scheme (Environment Agency 2012, revised 2014).

This scheme involved the construction of a seven-kilometre-long inland flood bank, freshwater outfalls, a perimeter drainage ditch and the breaching of the modern shingle bank. This created an intertidal compensatory habitat of 183 ha, on which saltmarsh and mudflats are currently developing.

Breaching and cessation of artificial maintenance on the beach have introduced a new element of dynamism to this coastline and the newly breached channel is currently shifting rapidly, revealing new vertical sections as it develops a more stable thalweg.

The modern shingle bank is continuing to migrate inland and the beach level is lowering periodically. There has been localised accretion of sand and shingle around rock-rubble (labradorite) structures, emplaced to defend the eastern end of the realignment area and Bunn Leisure Holiday Park. The Channel Coast Observatory is monitoring these changes (Environment Agency 2016) (Fig. 1).

Systematic archaeological investigations on the shore at Medmerry began with the work of White (1934). This article is just one more step in a long-continuing history of recording which will continue as new archaeological sites become visible.

As sites are exposed, they are being recorded, photographically and by planning, by volunteers from CDAS. In addition, digital 3D images of some of the beach structures are available on the website www.cdas.info/. Other local observers have kindly reported finds to us.

The Holocene deposits and archaeology on the beach today represent a seawards extension of sites excavated by Archaeology South-East (ASE), landwards of the shingle bank (Stephenson 2014; Stephenson and Krawiec 2019).

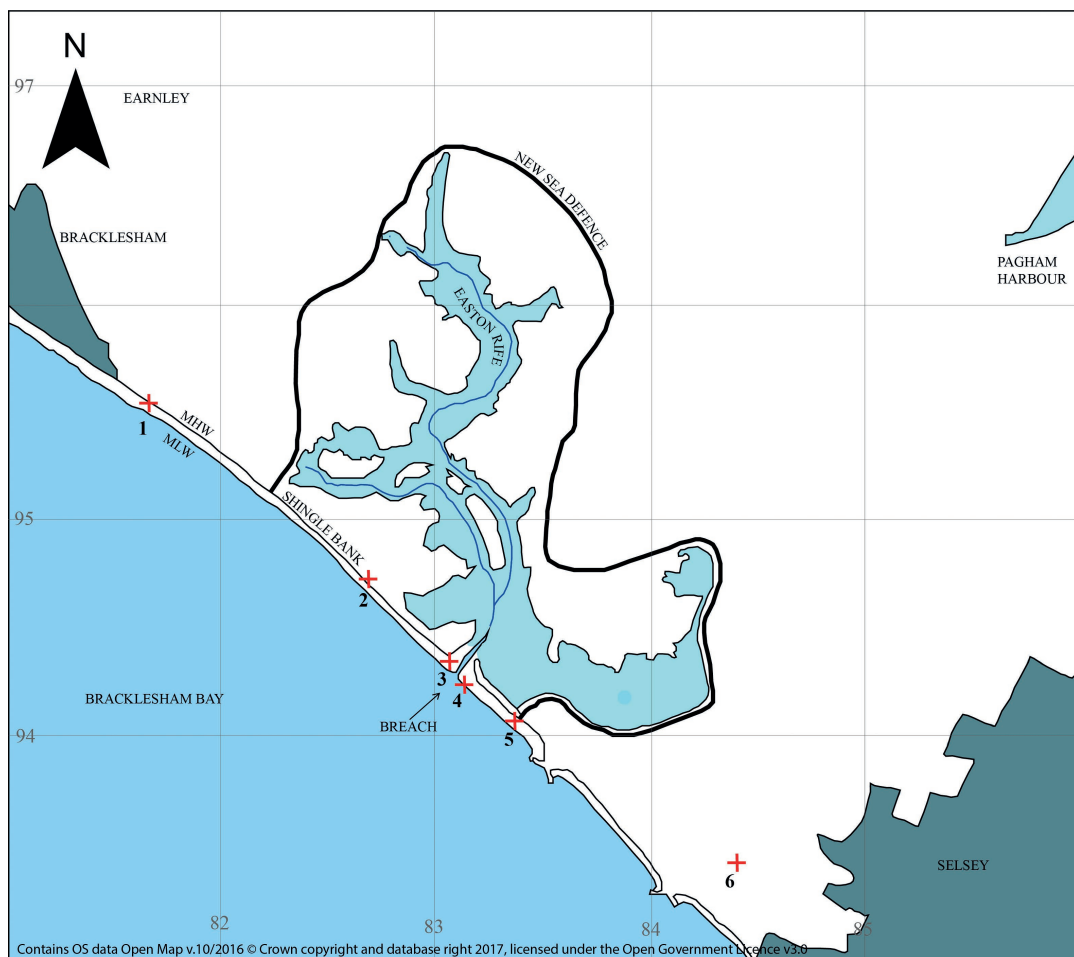


Fig. 1. Location map, based on Ordnance Survey Explorer Map OL8 (1:25000), with the breach and Mean High Water (MHW) within the area of the Medmerry Managed Realignment Scheme shown schematically, since these positions change constantly. **1.** Approximate position of Iron Age skeleton on Earnley Beach; **2.** Thorney Farm walls and well; **3.** Post-medieval timber structures (MBW 3 and 4); **4.** and **5.** Bronze Age burnt mounds (MBE 1 and 3); **6.** Medmerry mill.

Current work on the shore is a community project. Community and volunteer archaeology generally present some problems in terms of access to scientific analysis, especially radiocarbon determinations and osteological studies. However, the support of Historic England, the CITiZAN project (Coastal and Intertidal Zone Archaeological Network based at the Museum of London and University College London), and Archaeology South-East has been extremely helpful here.

THE WIDER PALAEOGEOGRAPHIC AND ARCHAEOLOGICAL CONTEXT

The coastline of Sussex and Hampshire changed significantly during the Pleistocene. During low sea-level stands, the area now covered by the water of the English Channel was an expanse of low-lying land.

A major river system (the Channel River) flowed along it, east to west, fed by tributaries including the River Solent (James *et al.* 2010; Murphy 2014, 33; Bates 2005). Bates *et al.* (1990) discuss the

known Pleistocene channels between Earnley and Selsey.

A number of channels of different ages are present on the beach at Medmerry but only one Holocene channel was clearly defined during the present programme of work.

The postglacial (Holocene) palaeoecology and archaeology of adjacent areas has been investigated in some detail. Investigations of the mainland coastline north of the Isle of Wight in the Holocene were undertaken by Wallace (1996, 1999a, 1999b) and are summarised in Cracknell (2005, 146–148); see also Tomalin *et al.* (2012, 124–133).

However, while the map Wallace proposes for the Iron Age to Anglo-Saxon coastline between Littlehampton and Portsmouth is, without doubt, adventurous and imaginative, it cannot be relied upon in detail.

His proposal that there was a Roman fort, a church or cathedral or other stone structures on the Mixon Reef and Church Rock has been discounted. It is now considered to be a natural rock formation, partly modified by quarrying which originated in the Roman period and continued until 1827 (Bone and Bone 2014).

The suggestion that an Anglo-Saxon cathedral might have existed on the Mixon Reef has endured as a myth and seems to have originated with William Camden's *Britannia*. The translation by Edmund Gibson (1695, 170), states: 'In this Isle there are some obscure remains of that ancient little city, in which those Bishops resided, cover'd at high water, but plainly visible at low water'.

Although Camden was rigorous, for his time, his source of information was unreliable (Bone and Bone 2014, 97–98). The former cathedral was in fact at Church Norton and was not lost to the sea (Tatton-Brown 1994, 25).

Nevertheless, Wallace is correct in saying that during the Holocene the islands of Southsea, Hayling, Thorney, Medmerry and Selsey extended further south, and appear to have been protected by an offshore shingle barrier or barriers, perhaps at a location several kilometres offshore.

If this interpretation is correct, the modern harbours of Langstone and Chichester are remnants of a much larger harbour, or estuarine system, and took up their present form after offshore barriers underwent erosion, creating the modern indented coastline.

Erosion of the exposed islands was especially intense in the 13th to early 14th centuries, due to a stormy climatic phase. There were major changes to the coastline at this time, leading to severe losses of land around Chichester Harbour and Selsey, which continued at a slower rate in later centuries (Cracknell 2005, 154–160).

In response to these coastal changes, a gravel causeway, the Wadeway, was built in the early to mid-14th century (with its final phase around 1400), to maintain a land route to Hayling Island. It is suspected that similar causeways to Thorney Island, and perhaps elsewhere, were emplaced at this time (Satchell 2014).

In Langstone Harbour, Hampshire, there was a shift in the neolithic period from an open fen habitat to carr woodland. The land that later became the harbour was then a low-lying area, drained by two freshwater channels, with open fen and carr adjacent (Allen and Gardiner 2000, 2007). During the Middle–Late Bronze Age a flat urnfield cemetery was established, with a transgression thereafter, creating the modern tidal harbour. In subsequent periods activity was focused on salt production, shellfish production, fishing and brickmaking, with significant military activity in the 20th century.

The Holocene transgression in Chichester Harbour may have begun approximately 6,000 years ago in the deeper channels, although much of the harbour was land until at least the Middle Bronze Age. Geophysical survey (sub-bottom profiling) by Titan Environmental Survey Ltd (2005) defined Holocene palaeochannels. The archaeology of the complex embayment is summarised in Francis (2004).

There is slight evidence for mesolithic to neolithic activity and Middle to Late Bronze Age settlement. Burials, metalwork hoards and occasional wooden structures have been recorded.

The Iron Age is marked by the fort at Tournerbury but more extensively by evidence for salt production. Fishbourne may have been the focus of Late Iron Age settlement and was a major Roman focus, with evidence for an early military phase and the later palace. A string of villas existed along the Chichester–Bitterne Road, with a tileworks near Dell Quay and salterns at a number of locations. The Iron Age temple on Hayling Island was expanded in stone.

In the early medieval period Bosham was a monastic and ecclesiastical centre, besides being the chief seat of Earl Godwin. From around AD

900, maritime trading expanded in association with fishing, salt production, oyster farming and boat building.

Land claim dates back at least to the 19th century, when the northern part of Thorney was enclosed. The most significant recent change has been in the form of East Head, which has retreated by more than 500m since the late 18th century (Searle 1975).

The palaeogeography and archaeology of the north-east coast of the Isle of Wight, with the main study area between Wootton Creek and Quarr, is presented in Tomalin *et al.* (2012), while Momber *et al.* (2011) report on the submerged mesolithic site of Bouldnor Cliff, where lithics and wooden artefacts have been recorded eroding from a former land surface at -11m OD. The final postglacial severance of the island from the mainland, due to rising sea level, is also discussed by Tomalin *et al.* (2012, 485–489).

To the east of the Selsey peninsula, with Medmerry on its south-west corner, longshore drift changes from a westward direction of sediment transport (around Chichester Harbour and westwards), becoming eastward.

The West Sussex coastal plain includes several estuaries and embayments. During some periods they were isolated from the sea by shingle spits and barriers, which formed due to longshore drift of sediment.

This had the effect of diverting the mouths of rivers eastwards, allowing mudflats, saltmarsh and, ultimately, freshwater wetlands to form in back-barrier environments.

Peat began to form behind coastal barriers at different times in the Ouse valley, on the Willingdon Levels, at Coombe Haven, near Bexhill, and at Worthing.

As the peat surface dried out, fen-carr woodland developed. The remains of this woodland are today exposed as ‘submerged forests’ on the shore at Bulverhythe and elsewhere. At Shinewater Park, on Willingdon Levels, near Eastbourne, a Late Bronze Age timber platform was constructed on the peat surface (Woodcock 2003, 2–6).

After the Late Bronze Age, peat surfaces in inlets along the West Sussex coast were transgressed by marine and estuarine sediments, although again not synchronously. This probably reflects breaching of shingle barriers at different times at separate places, due to local factors, in later prehistory.

Medmerry, therefore, is on the eroding promontory of the Selsey peninsula between the successively accretional and erosional inlets of the Hampshire and Sussex coasts. It is archaeologically significant because this coastline is changing extremely fast, constantly exposing new sites, and is likely to continue to do so in future.

MEDMERRY

Medmerry was a small island north-west of Selsey Bill in the Anglo-Saxon period, isolated from the mainland by channels which later became infilled by sedimentation (Goodburn 1987, 213). The island is defined in the soil map (Hodgson 1967); the geology is discussed below.

Rodney Castleden (in Goodburn 1987) proposed a reconstruction of the Anglo-Saxon coastline at Medmerry, with the shore about two kilometres seawards, but this can only be an extrapolation based on erosion rates recorded in recent times; for example, a loss of 60m between 1875 and 1909 cited in a report of 1950 by Louis and Duvivier (in Goodburn 1987).

It is plainly impossible to reconstruct what is not there and to assume that modern erosion rates replicate those of the past. We can be certain that the coastline was further south in the past, and now offshore, but we cannot be at all confident about its position.

In July 2011, Archaeology South-East was commissioned on behalf of the Environment Agency to monitor groundworks covering some 60ha in the realignment area, and to undertake excavation, survey, the recording of structures dating from the Second World War and geoarchaeological studies (Stephenson 2014; Stephenson and Krawiec 2019).

A former brackish lagoon of later prehistoric date, just north of the modern coastline, was defined, and palaeolithic, mesolithic and neolithic artefacts were recorded. A late neolithic/Early Bronze Age pit was detected, together with a string of five burnt mounds, two dated to the Early–Middle Bronze Age, in lagoon-edge situations.

Middle–Late Bronze Age occupation was excavated in three locations, comprising up to 14 dwellings, together with waterholes/wells, rectangular structures and at least one cremation cemetery.

Late Iron Age and early Roman activity included at least one roundhouse, traces of field systems and

a cremation. Later Roman occupation comprised an enclosure and drainage ditches, as well as a cremation.

Anglo-Saxon features included pits, one wicker-lined, ditches, a shell midden and one linear wooden structure. Similar linear wooden structures were of the 13th–14th centuries to the post-medieval period; their interpretation is uncertain, but they may have been fish weirs or related to oyster cultivation or land claim.

A post-medieval chalk-lined well with a circular basal timber structure – a well-frame – was also excavated as well as coastal military defences of the Second World War, including six pillboxes and gunnery range buildings.

How does this information from the excavations in the realignment area correspond with archaeological features on the shoreline?

The earliest archaeological survey on the eroding beach at Medmerry was undertaken by White (1934). She recorded a number of eroding sites, seemingly all of Anglo-Saxon date.

However, the principal difficulty in relating what was recorded then with what is visible on the shore now is that, due to subsequent rapid coastal change, it is hard to relate the sites to the modern coast or, indeed, to any fixed positions at all, since they do not have the precise locations given by modern GPS.

The sites visible in the 1930s included occupation deposits, the floors of buildings, (in some cases perhaps of *grubenhäuser*, or sunken-featured buildings), pits and middens, all probably of mid-Anglo-Saxon date.

The deposits included burnt daub, querns (probably from the Mixon Reef), loom weights, wood and faunal remains (including molluscs, fish and domestic animals). Goodburn (1987, 218–222) interpreted the wooden items as being from a barrel and a clinker-built boat with suggested dendrochronological dates of 770–810 AD. All this has now gone; what we see now on the shore is entirely new.

Erosion has exposed a sequence of sediments comprising the former modern agricultural land surface developed on intertidal clay, a basal biogenic Holocene clay sediment ('saltmarsh peat'), burnt mounds and spreads of heat-shattered flint, and underlying Palaeogene sediments.

These were often weathered to form palaeosols and are cut through by Pleistocene and Holocene

palaeochannels. However, it is not possible to see a complete section through all these deposits, due to stepped erosion and beach cover, and the overall sequence has to be based on temporary windows through the beach cover and levels of deposits in relation to OD.

A summary of the Holocene stratigraphy, as understood at present, is given in Fig. 2. For practical convenience in terms of access, the coastline east of the modern breach channel (which usually cannot be crossed safely) is referred to as Medmerry Breach East (MBE), that to the west as Medmerry Breach West (MBW). Separate numbering systems are given to the archaeological contexts in the two areas (Table 1).

PRE-TRANSGRESSION AND EARLY TRANSGRESSION DEPOSITS

The Palaeogene sediments are of the Bracklesham Group, Middle Eocene Epoch, comprising glauconitic silty sand, silt and clay (Curry *et al.* 1977; Hopson 2009). Aerial photographs by Bone and Tracey (1996) showed that the exposed Palaeogene geology is weathered and unweathered Selsey Sand Formation, with Pleistocene palaeochannels and at least one Holocene palaeochannel, now visible at SZ 82870 94621: MBW 16.

The Pleistocene channels have not been seen during the present survey programme. The Holocene channel contains numerous shells of *Cerastoderma*, *Scrobicularia*, *Buccinum*, *Hydrobia* and other marine molluscs in its soft, grey, clay fill. No artefacts have been seen in this channel fill, although a few cattle bones have been noted. The pre-Holocene sediments have a greater fine sand/silt content and are much firmer than later sediments.

The sediment beneath burnt mound MBE 3 (SZ 83375 94125; Fig. 4) is a light greyish-brown, very firm fine sand/silt/clay with mottles of light grey, some of which appear to be former root channels related to palaeosol formation.

It is often stoneless but contains localised concentrations of large flint nodules and is thought to be the weathered Eocene beds shown by Bone and Tracey (1996, Plate 5). It formed a land surface in the Holocene before transgression.

It is thought that this relatively solid geology forms part of the seaward edge of a lagoon which was defined by Archaeology South-East by auger

Height (OD)	Stratigraphy recorded at MBE 2 (upper shore)	MBE 1 (lower shore)	MBE 3 (lower shore)
+1m OD	WW2 and later concrete and rubble with some cemented mineral-impregnated beach shingle. Top of former agricultural land surface at +1.807m OD, developed on reddish brown clay/silt with reddened indurated annelid burrows and root channels. Thickness 1.2m, merging down into grey intertidal clay. Ruin of Medmerry Farm at this level.		
0m OD			
-1m OD	Base of MBE 2 at about +0.6m OD, merging downwards into grey intertidal clay, sometimes with laminations, inclined to south. Some shells of <i>Cerastoderma</i> , <i>Scrobicularia</i> and <i>Hydrobia</i> . Some pebbly inclusions. At MBW 16 a palaeochannel is incised into intertidal and Tertiary sediments.		
-2m OD		Intertidal clay above. Top at -0.112m OD. Burnt flint deposit. Base at -0.358m OD. Intertidal sediments below, mainly clay, but including sandy units.	Basal 'saltmarsh peat' above. Top at -0.067m OD. Burnt flint deposit. Base at -0.598m OD. Greyish brown firm fine sand/silt below. Mainly stoneless but with localised concentrations of large flint nodules. Tertiary sediment forming former land surface and palaeosol. Some Holocene tree roots.
		Becoming more woody towards base. Impenetrable with auger below 1.22m from base of main burnt flint deposit.	

Fig. 2. Summary of stratigraphy on Medmerry beach, with Bronze Age burnt mounds shaded.

survey in the realignment area (Stephenson 2014; Stevenson and Krawiec 2018).

At the ASE excavations, a basal biogenic sediment best called a saltmarsh peat (-3.73 to -3.74m OD) has been radiocarbon dated to 4260–4040 cal BC, weighted mean calculated from Beta-365386; 5350±40 BP and Beta-365387; 5300±40 BP (Stephenson and Krawiec 2019, table 10.1); 5325±29 BP; T'=0.8; T'(5%)=3.8; v=1 (Ward and Wilson 1978). A saltmarsh peat also outcrops on the lower shore.

A well-preserved root system of at least one oak tree (*Quercus* sp.) is firmly rooted within the pre-transgression land surface on the shore at MBE 3. Other tree root systems were intermittently exposed along the shore at other locations (e.g. MBW 23).

The sample from the outer rings of the root system at MBE 3 dates to 2455–2290 cal BC (95%

probability; ETH-88960; ADS supplement Fig. A3.1). This is not a direct indication of the date of the local transgression at this location but gives a measure of the date at which rising groundwater (indirectly related to the progressive transgression) killed trees growing locally and then provided waterlogged anoxic conditions in which the roots were preserved.

BURNT MOUNDS AND SPREADS

A linear string of burnt mounds and spreads, comprising concentrations of heat-shattered flint (called 'burnt' here, for brevity, though strictly speaking incorrectly), extends along the shore on both sides of the breach (Table 1). Some are *in situ*, resting on a former land surface on Palaeogene deposits. Others are spills within Holocene creek fills.

Table 1 A summary of archaeological contexts recorded at Medmerry beach.

Medmerry Breach East (MBE)		
MBE 1	SZ 83142 94133	Burnt mound stratified in intertidal clay.
MBE 2	SZ 83237 94222	Section through upper sediments of sequence.
MBE 3	SZ 83375 94125	Burnt mound on Palaeogene deposits, with <i>in situ</i> tree root system, crossed by hurdle fencing.
MBE 4	SZ 93326 94148	
MBE 5	SZ 83200 94264	Burnt spread seen as surface exposure.
MBE 6	SZ 83209 94236	Burnt spread seen as surface exposure.
MBE 7	SZ 83225 94211	Burnt spread seen as surface exposure.
MBE 8	SZ 83222 94265	French pattern prawn pot from superficial deposits.
MBE 9	SZ 83404 94186 to 83325 94330	Linear channel, presumed former marshland drainage channel.
MBE 10	SZ 83235 94215	Wooden structure with some 'weaving' between posts.
MBE 11	SZ 83378 94108	Wooden structure.
MBE 12	SZ 83321 94143	Wooden structure.
MBE 13	SZ 83078 94304	Wooden structure, Machine-sawn sawn posts, presumed to be recent groynes.
MBE 14	SZ 8337 9416 (approximate)	Part of lower stone of rotary quern, from Lodsworth Greensand Quarry. Unstratified, probably Roman.
MBE 15	SZ 83393 94251	Line of ceramic drainpipes, each c. 0.3m long. Probably 19th or 20th century.
MBE 16	SZ 83251 94350	Area of wattling. No date available.
MBE 17	SZ 83324 94182	Row of unmachined posts. Presumed to be 19th–20th century.
MBE 18	SZ 83368 94106	Single solitary post.
MBE 19	SZ 83332 94125	Arrangement of posts on a rectangular grid, undated.
MBE 20	SZ 83317 94129 (approximate)	Burnt mound. Position approximate: this could be a re-sighting of one of the burnt mounds previously recorded.
Medmerry Breach West (MBW)		
MBW 1	SZ 82927 94508 to 82773 94687	Burnt flint spreads in peaty clay matrix over Palaeogene sediments.
MBW 2	SZ 83187 94483	18th century slow match pouch (approximate location).
MBW 3	SZ 83114 94419	Setting of posts and braces. Approx. 10.3m long. Aligned 20 degrees from north. 7.9 metres from Context 4.
MBW 4	SZ 83104 94419	Setting of posts and braces. Approx. 8.9m long.
MBW 5	SZ 83049 94435	Timber and brick-lined well.
MBW 6	SZ 82721 94716	World War 2 collapsed beach scaffolding.
MBW 7	SZ 82924 94550	Wooden fencing posts along former drainage ditch, believed to be recent.
MBW 8	SZ 82641 94817	Flint and brick walls of Thorney Farm.
MBW 9	SZ 82736 94692	'Dark deposit' within sediment sequence, probable palaeochannel fill.
MBW 10	SZ 82779 94713	Line of posts parallel to shore. Possible earlier sea defence.
MBW 11	SZ 829 945	Fragment of basketry photographed by beach walker, approximate location. Possible fish basket.
MBW 12	SZ 82601 94824	Well lined with chalk blocks.
MBW 13	SZ 82590 94865	Displaced linear brick wall, possible remains of military defence.
MBW 14	SZ 82793 94707	Bank and ditch continuing inland feature, roughly south across the beach.
MBW 15	SZ 83082 94401	'Fish basket' stratified in grey intertidal clay.

Table 1 (*continued*)

Medmerry Breach East (MBE)		
MBW 16	SZ 82870 94621	Bank and ditch roughly parallel with shingle bank. Displaced anti-tank blocks. Channel fill with <i>Cerastoderma</i> nearby.
MBW 17	SZ 82701 94769	Poorly-defined timbers with gravel banked against them. Cut vertical upright and small uprights.
MBW 18	SZ 83164 94469	Brick structure, 19th/20th century, possible base of a sluice gate.
MBW 19	SZ 82422 95000	Spread of ironstone slabs, probably not archaeological.
MBW 20	SZ 82845 94660	Dumb-bell shaped feature. Probably military.
MBW 21	SZ 82906 94516	Area of wattling, possible fish trap.
MBW 22	SZ 82936 94517	Area of burnt flint.
MBW 23	SZ 82908 94511 to 82895 94510	Tree root system in grey clay, adjacent to burnt flint spread. Another possible example further upshore.
MBW 24	SZ 82679 94757	Component of large vessel. Curving board, 30mm thick x 360 mm wide. Surviving length c. 3.5m. 25mm dowel/trenail holes.
MBW 25	SZ 82821 94644	Burnt flint scatter, some wood in adjacent intertidal creek. Includes <i>Cerastoderma</i> .
MBW 26	SZ 83128 94296	Lines of large squared timber posts parallel to shore and crossing intertidal creek. Presumed early sea defence.
MBW 27	SZ 82931 94584	Gravelled trackway, probably military.
MBW 28	SZ 82650 94836	Flint and concrete pads, 4 or possibly 5. Probably military.
MBW 29	SZ 82522 94920	Setting of oak staves, possible well but poorly exposed.
MBW 30	SZ 83115 94503	Concrete tank: military.
MBW 31	SZ 83111 94428	Ill-defined group of posts, partly submerged in breach channel.
MBW 32	SZ 83111 94503	Circular timber and brick-lined well. Bricks frogged wasters, so probably late 19th/20th century.
MBW 33	SZ 82952 94549	Unstratified rib from frame of large timber vessel, with trenails probably 18th/19th century.

Two sites on the beach will be described here: MBE 1 (SZ 83142 94133) and MBE 3 (SZ 83375 94125). The others are surface scatters of burnt flint on the shoreline, seen in small windows in beach cover, with no clear stratigraphic context. It is assumed that this linear arrangement of burnt mounds represents, at least approximately, the seawards edge of the lagoon defined by Archaeology South-East.

MBE 1

MBE 1 was immediately adjacent to the new breach channel. It underwent significant erosion in 2014–15 and was largely destroyed by 2016. The base of the main burnt deposit was at -0.358 m OD and its top at -0.112 m OD. There were also thinner spills of burnt flint within the grey clay estuarine channel fills. Hand augering beneath the main burnt deposit showed:

0–0.15m: grey clay, occasional small angular flints;
0.15–0.22m: grey, sandy clay;
0.22–0.53m: grey clay with some wood fragments and invertebrate burrows;

0.53–0.63m: coarse grey, slightly clayey sand;

0.63–0.83m: grey clay;

0.83–1.18m: coarse grey slightly clayey sand with some angular flint pebbles;

1.18–1.22m: grey clay with relatively abundant wood fragments.

The deposits represent a Holocene palaeochannel fill. Deposits were impenetrable with a hand auger beneath this, perhaps because the contact between the base of the palaeochannel and eroded Palaeogene sediments had been met. Bone and Tracey (1996) indicate Holocene muds in this vicinity and it appears that the burnt deposit overlies, and is intercalated within, deposits of this type.

Grey intertidal clay lies between discrete spreads of heat-shattered flint in places, so MBE 1 comprised eroded spills of burnt flint associated directly to an active intertidal channel. This is thought to be related to a palaeochannel orientated NNE–SSW defined by auger survey by Archaeology South-East (Stevenson 2014, 110, 143; figs 66–68). This



Fig. 3. Bronze Age burnt mound spills in eroding intertidal sediments (MBE 1).

was a tidal creek which was infilling in the Middle Bronze Age.

MBE 1 was overlain by grey clay with valves of *Scrobicularia plana*, some paired and in life position, showing that intertidal sedimentation continued after its use. The deposit itself had a brownish-grey, sandy silt matrix but was dominated by abundant burnt (and also unshattered) flints, up to about 0.06m, and measured 29.5m (SE–NW) and 16.0m (SW–NE) when first seen.

There were occasional twigs in the deposit. Despite repeated inspection, no lithic or ceramic artefacts were seen.

MBE 3

MBE 3 rested directly on the presumed eroded Palaeogene sediment (see above) and this, together with the oak tree roots ramifying it, indicates that it was originally in a terrestrial situation.

The base of the burnt deposit was at -0.598m OD and the top at -0.067m OD. It measured 15m north–south and 19.5m east–west when first seen.

The matrix was of grey clay/silt with abundant, heat-shattered and some unshattered flints. It included abundant twig fragments and occasional larger pieces of wood.

Shells of *Scrobicularia plana*, *Ostrea edulis* and *Cerastoderma edule* were common at the top, but may have been intrusive from higher deposits, partly by burrowing. No artefacts were seen.

The only bone find was a left humerus of a Great Northern Diver, *Gavia immer*. It was unburnt and showed no cuts or any sign of modification, so it probably arrived by natural processes.

The burnt flint deposit was directly overlain by an estuarine detritus mud of brownish-grey, with a sharp contact, then a basal saltmarsh peat, with grey intertidal clay above this. The very basal part of a

roundwood fence, including *Alnus* (alder) and *Ulex/Cytisus* (gorse/broom), cut across MBE 3; only a few upright rods and intermittent basal sails survived but the orientation seemed to be approximately 40 degrees from north (Fig. 4).

It is estimated to have been constructed in 1600–1575 cal BC (94% probability; ADS supplement, Fig. A3.1) or 1555–1450 cal BC (91% probability). Chronological modelling of the available radiocarbon dates from four of the burnt mounds excavated by ASE (Stephenson and Krawiec 2019, table 10.1; ADS supplement, Appendix 1) suggests they were in use in the centuries around 1500 cal BC (ADS supplement Appendices 1 and 3; Fig A1.1, Fig A3.1).

This fence is therefore broadly contemporary with the inland sites but whether it represents an original integral element of the burnt mound (perhaps a revetment?) or a subsequent insertion is unclear.

Burnt mounds and spreads are very widespread across the UK and were used to produce hot water. What use was made of the hot water is unknown, and there is certainly no new evidence from the present sites, but it may have been for bathing (perhaps including a steam bath) or possibly have a ritual function. Cooking, malting/brewing, plant food drying and a range of other functions have also been suggested (Tomalin *et al.* 2012, 185–186).

AN IRON AGE SKELETON AND OTHER FINDS FROM EARNLEY BEACH

A partial skeleton was found in December 2013 at approximately SZ 816 955 by Mrs Cathy Dennis of Earnley. When first observed, the base of the spinal column and some arm bones were seen. The bones were surrounded by “black fibrous” material.

Tidal erosion then removed most of the arm bones but exposed the upper spinal column and cranium, so Mrs Dennis was able to see that this was



Fig. 4. Eroded section showing pre-transgression surface, burnt spread, base of hurdle fence and overlying estuarine biogenic sediments (MBE 3).

a human skeleton (Fig. 5) and reported the find to Sussex Police. It was necessary to lift the skeleton rapidly, given the rate at which it was eroding, and it was taken to the mortuary at St Richard's Hospital, Chichester.



Fig. 5. Earnley Beach. Surviving elements of an Iron Age skeleton and related degraded wood (top left), just before lifting.

Regrettably, it was found on New Year's Eve and professional archaeological staff, although not contacted, were not at work. Low resolution mobile phone images are all that is available to provide data on context. According to Mrs Dennis, Sussex Police did not take photographs of the skeleton in position but of the bones when lifted. This account is, therefore, a retrospective reconstruction of what was there.

Mrs Dennis reported that the skeleton was in grey clay. In this locality sediments of this type are palaeochannel fills. The "black fibrous" material was around, and partly overlying, the skeleton. No sample of this material was retained by Sussex Police.

From the images it appears to be degraded wood: three degraded parallel planks can be discerned at the top left of the cranium and spinal column, but whether these represent a wooden platform, or even part of a boat, cannot now be determined.

The leg bones and pelvis had been lost to erosion before the skeleton was seen by Mrs Dennis. The humeri are visible in one pre-collection image but were lost before the bones were lifted. The right humerus was at about 60 degrees from the spinal axis in the photograph.

The partial vertebral column was completely articulated. The cranium was disarticulated and

separated, having been rolled over to present its basal surface, but still stratified within intertidal sediments.

From the images available it is possible to reconstruct the original position of the body: lying on its left side with its left and right arms spread outwards.

As part of their forensic investigation Sussex Police submitted a vertebra to Cellmark Forensic Services for radiocarbon dating to assess the age of the remains. Carbon and nitrogen stable isotope analysis was applied to the sample, as the potential for diet-induced radiocarbon offsets if an individual has taken up carbon from a reservoir not in equilibrium with the terrestrial biosphere (Lanting and van der Plicht 1998), which might have implications for the chronology of the burial.

The stable isotope results indicate that the individual consumed a diet predominantly based upon temperate terrestrial C_3 foods (Schoeninger and DeNiro 1984; Katzenberg and Krouse 1989). The radiocarbon result is therefore unlikely to be affected by any significant reservoir effects (Bayliss *et al.* 2004) and the calibrated date range, 810–670 cal BC (2 σ ; SUERC-52367) can be regarded as an accurate estimate of the date of deposition.

The surviving skeletal elements were analysed by Dr Paola Ponce and consisted of a cranium, eight thoracic vertebrae, a right scapula and a small fragment of bone that probably belongs to the spinous process of a lumbar vertebra.

The skeleton is of a male, aged 25+, probably middle aged, with arthritis of the spine, *os acromiale* on the right scapula, representing localised trauma to the shoulder, *cribra orbitalia* in the orbits, indicating a poor diet, tooth attrition, pre-mortem loss of teeth, calculus and periodontal disease (Ponce 2018, see ADS supplement Appendix 2).

There is no reason to think that this was a high-status individual. The body seems most likely to have been a placed deposition. The depositional and potentially ritual context is discussed further by Dr Ponce.

Placing bodies (or parts of them, mainly skulls) in rivers and mires is well known from later prehistory (Murphy 2009, 169–171) and continued into the Roman period (Hingley 2018, 16).

Further to the east, at roughly SZ 818 953, Mrs Dennis had previously seen the eroding base of a "fish-basket or eel trap", some "curving timbers" and a "scatter of bones." These are probably more

recent in date, relating to Anglo-Saxon and later activity in the area (White 1934).

The location of all these finds has been under a cover of beach sand and shingle since the discovery, but the site is being inspected periodically after storms in the hope of gaining more information on context or to see related finds.

LATE ANGLO-SAXON TO POST-MEDIEVAL STATIONARY FISHERIES

Despite the evidence for Romano-British to mid-Anglo-Saxon activity excavated just inland by ASE there is, at present, a chronological hiatus on the shoreline after the Iron Age, although part of the lower stone of a rotary quern, from the Lodsworth Greensand Quarry (MBE 14: SZ 8337 9416 approx.), was found unstratified, probably transported from elsewhere. The stone is probably of Roman date and might have come from an eroded refuse deposit or a wreck.

Within the area of Borrow Pit 8 at the ASE excavations, a series of linear wooden structures have been defined. They comprise vertical posts supporting wattling and have been dated to the late Anglo-Saxon period to the 14th/early 15th centuries (Stephenson 2014, 80–87).

Interpretation is unclear but they may have been fish traps or oyster cultivation structures or even, conceivably, boat moorings or structures related to land claim.

However, the shoreline sites provide clear evidence for a phase of stationary fishery dating to around AD 1500–1650, which has not been noted inland and for which there is a historical record in the Selsey peninsula. Page (1907, 270) notes that in 1607 proceedings were instituted against eleven persons in different parts of the peninsula for destroying “spawne and frye and the brood of sea fische” by the use of “weares and other devices”.

In June 2015, substantial lines of posts supporting linear wattle fencing (MBW 3 and 4) were observed close to the new breach.

MBW 3. SZ 83114 94419:

A setting of posts and diagonal braces approximately 10.3m long, supporting linear wattle fencing (including willow/poplar *Salix/Populus* sp) (Fig. 6). A single radiocarbon date (ADS supplement Fig. A3.1) suggests construction in cal AD 1480–1645 (95% probability; SUERC-66909).

MBW 4. SZ 83104 94419:

A setting of posts and diagonal braces approximately 8.9m long with linear wattling, including an alder (*Alnus glutinosa*) vertical post, less well exposed. A single radiocarbon date suggests construction in cal AD 1495–1605 (67% probability; UBA-31689; ADS Supplement Fig A3.1) or cal AD 1615–1665 (28% probability).

MBW 3 and MBW 4 converge in an inland direction, but at a very acute angle. They are 7.9m apart. In addition to these substantial structures, ephemeral fragments of baskets have been exposed, stratified within the intertidal clays.

MBW 15. SZ 83082 94401:

A basket exposed on a surface of clay/silt. The surrounding sediment included shells of *Cerastoderma* and *Littorina*. The structure, as exposed on the eroded surface, was 0.35m x 0.40m and contained a faintly defined inner ring of basketry, 0.12m across (Figs 7 and 8).

The stems used (*Salix/Populus* sp) were about 3mm across and used in bundles of 3–5, woven around uprights. A single radiocarbon date (ADS Supplement Fig. A3.1) suggests construction in cal AD 1460–1635 (95% probability; SUERC-60639).

MBW 15 was lifted and subsequently cleaned by Dr Michael Lobb, partly to obtain a sample for radiocarbon dating. The inner circle of stems (which did not survive cleaning) could imply that it was part of a fish trap, with a conical element inside, perhaps an eel trap.

A second ‘fish basket’ (MBW 11, SZ 829 945 approx.) was photographed by Peter Hughes, a former RSPB warden, but no sample was collected for dating and it had eroded away before CDAS could examine it.

MARITIME FINDS

Unstratified ship-related finds have been noted at Medmerry, perhaps coming from the nearby protected wreck *HMS Hazardous Prize* (AD 1706) in Bracklesham Bay or from another wreck entirely. Hand-made nails are frequent along the shoreline.

A (recently split) curving board from a large vessel, 0.03m thick x 0.36m wide and approximately 3.5m long, with 25mm dowel/trenail holes (MBW 24, SZ 82679 94757; Fig. 9) was recorded.

Part of a curving rib (MBW 33, SZ 82952 94549), 2.2m long, with cross-section 0.25 x 0.20m and showing many dowel holes and trenails, was also



Fig. 6. Post-medieval braced timber structure (MBW 3).



Fig. 7. 'Fish basket' *in situ* and after cleaning (MBW 15).



Fig. 8. 'Fish basket' after cleaning (MBW 15). Photo: Michael Lobb.



Fig. 9. Board from a large vessel (MBW 33).

seen. These timbers are thought to be from vessels of 18th- or 19th-century date.

A wooden peg or trenail was recovered from grey clay/silts approximately 0.10m above burnt flint deposit MBE 003 (SZ 83375 94125). It was elongate, about 0.22m in length, and cut from mature oak. Both ends had been sawn. The surfaces were abraded but cuts had been made with a metal tool.

Generally around 25mm in diameter, it widened to a 'head' around 42mm across. The 'head' had been finished by cutting to form an irregularly octagonal cross section.

A leather slow match pouch (MBW 02; Fig 10), perhaps of 18th-century date, was found by Darren Screech at the edge of the modern breach channel (SZ 83187 94483 approx.). It was stratified at a depth of around two metres in intertidal clays.

Slow match pouches provided a safe means of igniting grenades aboard naval ships: they provided a light for ignition without a naked flame, which might have caused uncontrolled fire.

An example from the wreck of the first HMS *Invincible* is illustrated and described by Bingeman (2015, 149). An account of the Medmerry example and its conservation is given in Nordgren and Middleton (2018).

It comprises a lenticular pouch of two halves of leather, probably formed by wetting, then stretching over a form, with an associated strap. The three components were originally sewn together, but only some thread survived. A gap in the sewing marks the place where the fuse itself could be accessed and withdrawn.

Mr Screech reported that the pouch originally contained "grass", but he discarded this. Whether it really was grass or degraded fuse string cannot now be determined.

The surviving part of the strap (torn at its distal end) is approximately 225mm long, narrowing from a width of 55mm where it was sewn into the pouch, narrowing to 30mm, where it is torn. The pouch itself is about 135 mm in diameter.

It has a scar where some sort of label or insignia on fabric was attached. Crudely scratched on one surface are letters which appear to be D_Y, perhaps the initials of the owner (Fig. 10).

The artefact is unlike the example from HMS *Invincible*, which is made of 'fearnought' cloth, fire-resistant material made of wool cloth which had been severely shrunk to give a very close weave), although it is of similar size and plainly of similar function. The RSPB, as manager of the location, has donated it to the National Museum of the Royal Navy (accessed as MBW 002).

19TH CENTURY FARMING

Medmerry Farm

The loss of Medmerry Farm to erosion is relatively well documented. Indeed, one component of that farm, the 19th-century windmill, still survives within Bunn Leisure Holiday Park.

Bone (1996) records geologist Clement Reid's observation that between 1889 and 1891 about 18m of land was lost. By about 1900 the farm buildings were little more than romantic ruins on the shore and were photographed with a languid, blazered



Fig. 10. Leather slow match pouch (MBW 2).

and capped gentleman sitting before them on a fallen wall (*ibid.*, plate 1).

Thorney Farm

Thorney Farm, not to be confused with Thorney Island, which lies to the west, is more remote and has a less clear history of loss. However, between January and April 2016, the flint and brick walls of part of this farm (MBW 8, SZ 82628 94833) were exposed and then destroyed by erosion, leaving scant time for recording by CDAS (*see* digital image, www.cdass.info/).

By the summer of 2016 only collapsed and displaced rubble survived. No doubt more elements of the farm will be exposed as the shingle ridge withdraws inland.

Although the appearance and then the rapid destruction of the remains of the farm impressed everyone involved in recording, the archaeological evidence is slight.

CDAS recorded and planned a linear wall, extending seawards. It was constructed of flint in the local vernacular style of the 19th century, with brick settings and corners (Fig. 11) and a curving end to ease turning transport.

To the west other walls were planned, making a roughly rectilinear space, but they do not make a comprehensible plan so far. Surprisingly, no Victorian artefacts – ceramics or glass – were seen.

They are usually abundant at sites of this date, which may imply that the small part of the farm seen on the shore was not domestic, but rather was exclusively involved with agricultural activities. The West Sussex Record Office does not list any documents referring to the original construction of the farm.

The land of Thorney is mentioned in two 17th-century documents. The 1657 will of Alexander Wilson, of Hayling, refers to ‘the land of Thorney or East Thorney in East Wittering, Selsey’ (WSRO Add



Fig. 11. Walls of Thorney Farm immediately before loss by erosion (MBW 8).

Mss 15206) and a mortgage dated 1678, of Richard Taylor, of Fittleworth, mentions ‘the land named Thorney’ in relation to the Manor of Earnley (WSRO Add MS 1645).

Whether there were any buildings at the later farm site is unknown. Attempts to locate any documents from local landowners which might relate to farm construction have proved fruitless and so we are drawn towards cartographic evidence.

A map regression from 1842–1966, compiled by James Kenny and based on the 1842 East Wittering tithe award map and Ordnance Survey Maps of the 1st to 4th editions (1875 to 1966) shows the cartographic register of the farm towards its destruction (Kenny, *pers. comm*).

Erosion and landwards migration of the shingle ridge resulted in the farm getting increasingly closer to the shore on a static trajectory towards its loss. On the OS map of 1933, 3rd edition, the farm is not shown; its site then was under the shingle bank.

Mary Heron, born 1922, knew the area well (Heron 2015). She is insistent that the place should be named Thorny, rather than Thorney, but this is not supported by earlier maps or documents. It was a local usage, perhaps, intended to differentiate this site from Thorney Island. Mary recalls that her

grandmother’s family said that by 1914 the “only signs of human habitation were two dilapidated huts inhabited by four or five men who made a hundred tons of wonderful hay, building about ten haystacks. This was transported a wagonload at a time, over the shingle bank and along the beach, to be eaten by the ponies, horses and two cows at Miss Scrimgeour’s barn and stables at Selsey.”

Mary includes a photograph showing the hay wagon and riders coming over the shingle bank onto the beach. Delightfully, she says that it was so remote that when swimming ‘in such isolation, bathing clothes were not then necessary’.

Immediately adjacent to the farm wall the remains of a well, carefully lined with cut radial chalk blocks, with chisel and cut marks, was recorded (MBW 12, SZ 82601 94824; Fig. 12).

It had an internal diameter of 0.80–0.86m. Beneath flowing wet sand, the fill was of dark grey-brown clay/silt. Partial excavation was attempted, but only one hand-made nail was recovered, and further timber inclusions were felt, rather than seen. The wall included a short length of wooden board with a mortice in it, implying reuse of timber.

This well is assumed to be of similar 19th-century date to the farm walls, but it could be earlier.



Fig. 12. Chalk-lined well (MBW 12).



Fig. 13. Timber and brick-lined well (MBW 5).



Fig. 14. Drainage ditch MBW 16, including concrete anti-tank blocks and labradorite boulders from modern sea defences.

It is certainly very similar in construction to a chalk-lined, 18th–19th century well (OA30) recorded in the realignment area by ASE (Stephenson and Krawiec 2018). As the beach level drops, it is likely that it will be possible to investigate its lower levels.

MBW 5 (SZ 83049 94435) was another well, with an internal diameter of 1.7 m. It comprised staves of between 0.22m x 0.03m and 0.17m x 0.02m, with an unmortared internal lining of unfrogged bricks, of 19th-century date. Again, its surface fills were of flowing wet sand, so excavation was impossible, but augering showed greyish-brown sandy silt, down to 2.1m (Fig. 13).

Another circular timber and brick-lined well (MBW 32, SZ 83111 94503) was also recorded. The bricks were frogged wasters, so it was probably of late 19th/20th-century date.

The site of Thorney Farm is of interest in two ways. First, it is probable that other parts of it will be exposed as the shingle ridge moves landwards. They might be more comprehensible as more becomes visible.

Secondly, if it was a suitable site for a farm in the 19th century it might have been the right place for a farm site earlier. This requires attention and monitoring in the future.

Drainage ditches

Marshland drainage ditches of 19th-century date are becoming increasingly well-exposed on the beach (Fig. 14). These will best be planned from aerial photography.

Land claim and drainage dates back to at least the late 17th century. A conveyance of Sir William Morley (1700) on the Manor of Selsey mentions ‘30 acres of land lately fenced in from the sea near Medmerry’ (WSRO Mss 13479). Numerous later documents refer to flooding and new sea defences. None of these structures survive.

At SZ 83164 94469, two lines of laid bricks, roughly parallel to the shore, were recorded (MBW 17; Fig. 15). The bricks were unfrogged and measured 0.105 x 0.06 x 0.23m.



Fig. 15. Base of sluice (MBW 18).



Fig. 16. Collapsed anti-invasion scaffolding, erected in 1940 (MBW 6).

The structure lies across a former channel, continuing the line of a modern channel inland. Most probably it is the base of a sluice.

The West Sussex Record Office has a suite of documents, dated from 1902 to 1913 and originated by William Swales, that provide information on modifications to Medmerry Sluice in response to flooding: additional groynes, new wings on the landward side, and culverts (WSRO LD/1/MC4/1–12). Some were just plans and were never implemented.

20TH CENTURY MILITARY ARCHAEOLOGY

The military archaeology of Medmerry is reviewed by Russell (2014). The main features relate to the Coastal Crust defences of 1940 and the air-to-ground gunnery range of 1943 to around 1954.

Nothing on the beach is *in situ*. Munitions (mainly expended cannon bullets) are concentrated as a strandline left by the tide on the beach.

At low water anti-landing scaffolding of 1940 is visible. In less remote situations it has long since been removed for reuse or recycling, but it does survive here, albeit not in position, mainly around context MBW 6, SZ 82721 94716 (Fig. 16).

Concrete anti-tank blocks that had fallen into some of the 19th-century drainage dykes can be seen (Fig. 14) alongside labradorite boulders coming from recent sea defences. These two elements from 1940 were not recorded in the ASE assessment.

MBW 13. SZ 82590 94865:

This comprises large fragments of what may have been a hexagonal pillbox built of brick on a concrete base, judging from the angle inside these fragmentary pieces of wall. Apart from that, there are concentrations of brick and concrete rubble, pipework and metal debris on the upper shore, presumably bulldozed into place and later partly dispersed by the tides.

CONCLUSIONS

Unlike a conventional archaeological investigation, shoreline monitoring is open-ended. It is not comparable to an excavation or inland survey, both of which have clear end dates.

It is quite likely that more features, perhaps of types previously unsuspected, will be exposed by erosion after this report is published. We are dependent on the elements; we look forward to storms which, although destructive, expose new archaeological features.

However, sufficient work has been completed to show the changing palaeogeography of the area: trees growing on a land surface developed on Tertiary sediments, subsequent transgression, basal estuarine 'peat' formation and then the deposition of intertidal muds, partly within creeks.

Likewise, the work of CDAS has shown how land use changed through time on the site of the modern beach:

- Bronze Age 'burnt mounds', related functionally to the production of hot water, although some argue they were also associated with ritual activity;
- the placing of a man's body on a wooden structure in the Iron Age;
- post-medieval stationary fisheries, dating to around 1500–1650;
- land claim and drainage from at least the late 17th century, if not earlier;
- the casting-up of wreck-related artefacts, probably in the 18th–19th centuries;
- farming, including hay production, in the 19th and early 20th centuries;
- recreational use in the inter-war years of the 20th century;
- military use in during the Second World War and up to 1954;
- re-establishment of a 'natural' coastline as part of the Medmerry Managed Realignment Scheme;
- archaeological investigation in the 20th and 21st centuries.

CDAS will continue to monitor this beach for the indefinite future. This is a community project and the great benefit of volunteer participation is that repeated inspection of the shoreline is possible, sometimes at very short notice after storms.

Surveys commissioned by national organisations inevitably involve visits at a particular time, with no possibility of funding for repeat visits later and funding for recording after storms is hard to arrange as rapidly as is required (Murphy 2014, 146–150).

Volunteer involvement circumvents these problems. Eventually, a stable new coastline will develop at Medmerry, erosion will diminish, and the area will become less productive archaeologically.

Meanwhile new finds will be made. This report presents what is known in July 2019.

The sites have been publicised through walks for the RSPB and an on-site presentation for the Environment Agency. An article on the archaeology of the beach is included in Environment Agency 2016 (33–8), firmly linking archaeological monitoring with those for ecology and coastal change.

A presentation was also given at the CITiZAN conference in Bristol in 2016. Subsequent reports on new finds will follow.

The following supplementary reports can be found on the ADS website at <http://archaeologydataservice.ac.uk/archives/view/sac/>:

Modelling the Chronology of Burnt Mound Activity at Medmerry by Peter Marshall

The Human Remains by Paola Ponce

Medmerry Radiocarbon Dating and Chronological Modelling by Peter Marshall, Irka Hajdas and Sanne W. L. Palstra.

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AUTHOR: Peter Murphy, 162 Reginald Road, Southsea, PO4 9HP. petermurphy73@outlook.com

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