

CHAPTER 5

The archaeology of the NE Coastal Zone

5.1 Introduction

The archaeology of NE England was reviewed in Chapter 4 and in this chapter attention focuses on the NERCZA study area, that narrow strip of land and foreshore between LAT and one kilometre inland of MHWS. The archaeological assets of the coastal zone may be subdivided into a number of categories. At the most general level a broad distinction may be made between assets which are part of a land based or terrestrial landscape and those in which the context is specifically coastal or maritime. In the former the position of the coastline at various times is an arbitrary limit which circumscribed or truncated the distribution of assets. In the later case it is the coastline itself that is the unifying element in the distribution. In considering the status of assets in the coastal zone they will be assessed according to whether they are part of a terrestrial or coastal/maritime landscape but working within the broad chronological periods established in chapters 1 and 4. The convention has also been adopted in that when a particularly category of asset is first mentioned in this chapter and in chapters 6 to 9, it is set in **bold** and *italics* thus: ***flint scatter sites***. The intention here is to facilitate cross-reference between chapters and avoid duplication.

5.2 Early Prehistory - The Palaeolithic and Mesolithic Periods

5.2.1 Terrestrial landscapes

The whole of NE coast was engulfed by ice during the maximum stage of the Last Glaciation. This is known as the Dimlington Stadial after a location in Yorkshire and occurred between *circa* 24000 and 11000 cal BC (Jones and Keen 1993, 171). This sheet of ice, mainly moving from north to south, swept the landscape clean of any evidence for human settlement before the Last Glaciation and the story of continuous human settlement on the NE coast is generally taken as having begun with the first groups to arrive after the melting of the ice. At present the earliest dates for such arrivals come from the Mesolithic site at Howick where the initial phase of occupation is dated to *circa* 7800 cal BC (Bayliss *et al* 2007). However, two finds from the coastal zone raise the possibility of a human presence at an earlier time. These consist of finds of putative Lower Palaeolithic hand axes at Blackhall Rocks (Trechmann 1928) and South Gare Breakwater, Redcar (Rowe *pers comm.*). The former is said to have been found in gravel below boulder clay laid down during the Last Glaciation whereas the latter was found on the beach. If genuine, while intrinsically interesting, these isolated finds can nevertheless tell us little about the early human settlement of the NE coast.

The evidence for the early prehistoric settlement of the coastal zone in the immediate aftermath of the Last Glaciation consists mainly of stone tools, of which flint is the most common material used. The discovery of worked flint is a virtually ubiquitous occurrence throughout lowland, and much of upland, England. The coastal zone of the NE is no exception. Fieldwalking programmes in the NE, the Lincolnshire Wolds and Hampshire have demonstrated that any block of plough land can be expected to yield between 1 and 5

items of worked flint (Tolan-Smith, C. 1997, 82) per 1000m². This phenomenon simply reflects the fact that from about ten thousand years ago human activity occurred throughout the landscape. For this reason, isolated finds and low density distributions cannot be regarded as significant in the present context and should be regarded as evidence for incidental landscape use, or as 'background noise'. Accordingly, they have not been recorded in the present study though records can generally be found in HERs. Although human activity was distributed across the entire landscape, in some places this activity was more concentrated giving rise to what are conventionally known as *flint scatter sites*. The density levels required for the identification of a particular location as a flint scatter site are, of necessity, arbitrary but the results of an extensive fieldwalking programme in the Tyne Valley suggested that values of nine or more items per 1000m² should be regarded as significant (Tolan-Smith, M. 1995, 277-8). However, in very few cases in the coastal zone have data been published in a form that is susceptible to this level of analysis and it has been necessary to proceed on the basis that records of flint scatters represent concentrations above that which could be described as 'background noise' or 'incidental landscape use'. On the rare occasions where excavations have occurred, high density flint scatter sites have been found to be associated with other traces of human activity, such as the Howick Mesolithic hut (Waddington *et al* 2007).

Mesolithic activity is well documented along the NE coast but the evidence, with the exception of that from Howick, consists almost exclusively of flint scatter sites. Such are usually taken to represent industrial activity, that is the collection of raw material and the manufacture of implements. There is rarely anything to indicate that this was a specifically coastal activity, as raw material was also available on inland sites.

5.2.2 Coastal/Maritime landscapes

The only evidence for Mesolithic activity specifically focussed on coastal/maritime resources comes from the proximity of sites such as Howick (fig. 8.8) and Low Hauxley to the Mesolithic coastline as reconstructed from RSL data (Chapter 3) and offshore bathymetry, the limited recovery of shellfish remains and the remains marine mammals during excavations at those sites, and the collection of a barbed antler harpoon on the beach at Whitburn (fig. 7.4). Such implements are normally associated with the hunting of marine mammals.

5.3 The Neolithic Period

5.3.1 Terrestrial landscapes

Apart from features associated with flint scatters, generally considered to be domestic in nature, the Neolithic period saw the erection of structures of a more monumental nature. Throughout lowland England a range of monument types are known. The most prominent are earthwork enclosures defined by concentric banks and ditches, some of which may be discontinuous, the so-called *causewayed enclosures*, and *long mounds*, monuments at which one of the principal activities was funerary. The coastal zone includes examples of long mounds, the excavated site at Street Houses, Loftus, being the best known. There has

also been a putative identification of a causewayed enclosure represented by two ditch segments underlying the remains of the Roman fort at South Shields and dated to the 4th millennium cal BC.

5.3.2 Coastal/Maritime Landscapes

While the beaches might offer few opportunities other than for beachcombing, tidal estuaries may be considered to be arenas of abundance from a forager's perspective. A type of site commonly encountered in such situations is the *midden*, an accumulation of food debris from an adjacent settlement, and often consisting mostly of shellfish remains but also including fish and animal bones. A midden of this type has been identified at Cowpen Marsh in the Tees Estuary and the presence of the bones of domesticated animals has been taken to indicate a Neolithic date.

Neolithic material recovered from the Hartlepool submerged forest deposits includes a *fish trap* and burial. The latter has a radiocarbon date of 4680 ± 60 BP (HV 5220) and as it was recovered from a freshwater pool, it has been suggested that this might be a ritually deposited '*bog burial*'.

5.4 The Bronze Age

5.4.1 Terrestrial landscapes

The Bronze Age in England is represented by a range of structures that are monumental in character. The best known are probably the stone circles and standing stones, although *round barrows* or *cairns* are the most numerous and are the principal type of Bronze Age monument found in the coastal zone. They consist of circular mounds of earth and stone and usually cover one or more burials which may be either inhumations or cremations or both. The mounds are usually surrounded by a ditch from which the material has been quarried. Where excavations have occurred, the mounds have been found to overlie concentric rings of post holes which would originally held timber uprights. In the coastal zone the mounds survive either as upstanding earthworks or, where denuded by ploughing, the surrounding ditches may show as cropmarks. They may occur singly or in groups and, if closely spaced, may be described as forming a cemetery. In the NERCZA study area most of the round barrows identified lie in the coastal strip of the North York Moors, several substantial cemeteries having been identified. Elsewhere they are rare. This may reflect regional variability in funerary practices, but it is also likely to be the case that a number of round barrows have been destroyed during the course of urban and industrial development.

The only other type of Bronze Age monument regularly encountered in the coastal zone, especially in the area north of the Tyne, are *cists*, stone-lined graves within which may lie an inhumation or cremation accompanied by grave goods (fig. 8.3). Like round barrows, cists are often found in cemetery groups, sometimes within a barrow. However, cists were also a feature of funerary practices in later periods and caution needs to be exercised in interpreting examples without diagnostic grave goods.

5.5 The Iron Age and Romano-British Periods

5.5.1 Terrestrial landscapes

With the coming of the Iron Age the nature of the archaeological record changes in that the suite of mainly ritual or funerary monuments known from earlier periods is replaced by a range of structures more secular in character. The most prominent of the features attributable to this period are *hillforts* or, more commonly in the coastal zone, *promontory forts*. In the former, areas, often several hectares in extent, are encircled by a system of ditches and ramparts of a defensive aspect, whereas in the latter the circuit is incomplete, being supplemented by natural cliffs. These sites usually had within them groups of round buildings referred to as hut circles and these forts are considered to be centres of settlement, occupied either permanently or in times of unrest. Archaeological investigations of the headland at Tynemouth have suggested that the Anglo-Saxon Monastery and later Medieval Castle and Priory may have been preceded by an Iron Age promontory fort and a similar proposal has been made on the basis of field survey data at Dunstanburgh.

Multivallate forts (fig. 9.3) are also considered to be defensive sites and regarded as small scale versions of hillforts. As the name suggests they usually consist of several concentric circuits of ditches surviving as cropmarks. Originally there were probably ramparts between the ditches but these have usually been levelled. In some cases timber palisades were employed instead of ramparts and some sites might have experienced more than a single phase of development, with palisades being replaced by ramparts.

The most widespread type of site of Iron Age date is the *farmstead enclosure*, usually formed by a bank and ditch and containing one or more hut circles. In the coastal zone, especially in Northumberland, these enclosures are generally rectilinear in plan, in contrast to the more curvilinear examples found in the uplands. Although as a generic type these enclosures are regarded as an Iron Age phenomenon, many remained in use into the Romano-British period and some may have originated then, emphasising the thread of continuity in the rural landscape. Farmstead enclosures rarely survive as upstanding monuments in the coastal zone and have mostly been identified as cropmarks on aerial photographs.

Farmstead enclosures were the centres of mixed farms engaged in arable cultivation and the rearing of livestock. The HERs do not have any records of *ancient field systems* within the coastal zone, though several have been identified in Northumberland by the APTE. Research elsewhere in Northern England has shown that later, Medieval, field systems sometimes respected pre-existing features that can be revealed by retrogressive analysis (Tolan-Smith M. 1995 and 1997). An item specifically indicative of Iron Age and Romano-British Period is the *bee-hive quern*. This was a form of hand mill which consisted of a pair of superimposed stones the upper of which was rotated over the lower through the use of a simple handle. The upper stone was often markedly conical in form, giving rise to the 'bee-hive' description. As mills for grinding corn, bee-hive querns are indicative of arable activity.

Little is known about funerary or ritual practices in the Iron Age, though as indicated above some stone cists may belong to this period and barrow cemeteries of Iron Age date are a feature of the archaeology of East Yorkshire outside the study area.

5.6 The Roman Period

5.6.1 Terrestrial landscapes

The three-and-a-half centuries of the Roman occupation in the NE produced a wide range of monuments and other structures, only few examples of which are to be found in the coastal zone. No Roman town lies within a kilometre of the coast and the fort at South Shields is the only structure of this type within the study area, though a Roman post of some kind is generally supposed to have existed at the terminus of the Devil's Causeway at Tweedmouth. The termination of Hadrian's Wall at Wallsend lay beside the Tyne several kilometres upstream. The absence of major urban and military centres has meant that Roman roads avoid the coast and the period is chiefly represented by the continuation of elements of the rural settlement pattern from the previous Iron Age. For this reason, when discussing rural settlement in the coastal zone, the Iron Age and Romano-British periods have generally been treated together.

5.6.2 Coastal/Maritime landscapes

The fort at South Shields is regarded as one of the main supply depots for the garrison on Hadrian's Wall, provisions and equipment beginning brought to the mouth of the Tyne from elsewhere in the province and further afield in the Empire. An inscription records the presence of river boatmen from the Tigris who presumably crewed lighters that transported commodities upstream and between the shore and seagoing ships in the offing. It follows from this that there must have been port facilities at South Shields, but no trace of these survived the development of the river in the C19. There is, however, a Tyne and Wear HER record of a possible Roman shipwreck in the River Tyne immediately below the fort.

A further aspect of the Roman military presence on the NE coast is provided by the *signal stations* or *fortlets* built along the North Yorkshire coast during the C4, and part of a system that may have extended from Flamborough Head to the Tyne. Sites of this type have been identified at Goldsborough and Huntcliff while an intervening site may have been destroyed by quarrying in the C19. These structures were substantial stone towers and it is believed that their purpose was to provide warning of attack by raiders from the sea. To function effectively they would have needed to communicate both with inland defence forces and naval flotillas strategically positioned along the coast. One such naval base may have lain at the mouth of the Tyne, under the watchful eyes of the fort at South Shields.

Two coastal industries gained an important place during the Roman period, salt production and the cultivation of oysters. Although numerous salterns are known from later periods and Roman examples are known elsewhere on the east coast, none have been identified in the study area. Most of the NE coast is unsuitable for oyster cultivation and oyster beds of this period have not been identified.

5.7 The Early Medieval Period

5.7.1 Terrestrial landscapes

The early Medieval period in the NE is most clearly represented by inhumation *cemeteries* and by the ecclesiastical establishments of the early church, although few of the early structures that survive lie within the coastal zone. Primitive *cells* are known from Coquet Island, Inner Farne and St Ebba's, Beadnell, while the *monastic sites* on Holy Island, Tynemouth, Monkwearmouth (fig. 7.3) and Hartlepool were destroyed by Viking raids in the C9. Elsewhere, early sites are known to have existed from the survival of *sculptural fragments*.

Tradition, documentation and now archaeology has led to the identification of a major secular centre at Bamburgh, largely engulfed by the later medieval castle and its C19 reconstructions.

5.8 The Medieval Period

5.8.1 Terrestrial landscapes

The Medieval period may be defined as beginning with the Norman Conquest and ending with the accession of Henry VIII. The principal structures and monuments of this period are abbeys, castles, *towers* (fig. 8.4), fortified towns, parish churches, villages and field systems. The major *castles* consist of Bamburgh (fig. 9.4), Dunstanburgh and Tynemouth, while the *monasteries* on Holy Island (figs 8.5 and 9.5) and at Tynemouth, although established in the early Medieval period, were rebuilt and thrived during the Middle Ages. The towns of Berwick-upon-Tweed and Hartlepool were provided with *town walls* (fig. 9.6) during the medieval period.

Many *churches* can exhibit evidence of several periods of development, often mirroring the changing fortunes of the communities they served. Those originally built in the medieval period may have experienced modification and even wholesale rebuilding (fig. 8.6)

Many villages in the NE had their origins in the medieval period, either has planned developments by major lay or ecclesiastical landlords or as a result of organic growth around early centres. Those that did not survive or thrive into more recent times can be identified today as *deserted medieval villages (DMVs)*.

As in all previous periods the mainstay of the medieval economy was the land and traces of medieval agriculture, in the form of parcels of *ridge-and-furrow* are widespread in the coastal zone and throughout the region. It is usually possible to identify two types of ridge-and-furrow. One type exhibits a reversed 'S' shape in plan. This is referred to as the aratal curve and is assumed to reflect the use of teams of oxen to pull a plough with a fixed mould board, the curve arising because of the difficulty in turning a large team of oxen at the end of each ridge. This is the classic type of ridge-and-furrow and is considered to be mostly of

Medieval or early post-Medieval date. A second type is similar in size but straighter in plan and reflects the use of horses to pull the plough, which could be used in smaller teams and were more manoeuvrable than oxen. This change was contingent on developments in the form of harness used for draught animals and was occurring in England from the C16 onwards. Accordingly, straight ridge-and-furrow is usually regarded as being post-Medieval in date. However, with the exception of areas brought into cultivation at times of crisis, such as the Napoleonic Wars of the late C18 and early C19, most areas of ridge-and-furrow identified as post-Medieval were probably Medieval in origin and simply reflect a change in ploughing practice. Most of the expansion in medieval arable land had been accomplished by the end of the C13.

Coal mining is known from documentary sources to have been underway during the Medieval period, a C13 coal mine being recorded at Tynemouth.

5.8.2 Coastal/Maritime landscapes

The ancient ports along the NE coast, Whitby, Hartlepool, Blyth and Berwick-upon-Tweed must have provided facilities for visiting shipping in the form of quays, jetties and staiths but the continued use of these facilities in later times has meant that few traces of their early form survive.

The putative remains of a medieval *harbour* have been identified at Dunstanburgh Castle. To the SE of the castle, the head of an inlet known as Nova Scotia has been partly cleared of stone to reveal a sandy beach, one side of which is demarcated by the remains of a stone quay, the other by the rock ledge of Cushat Stiel. The inlet offers an anchorage sheltered from the north and east and vessels could be hauled out on to the beach. An important harbour existed at Hartlepool during the Middle Ages part of which was enclosed within the circuit of the town walls.

Other coastal/maritime activities, of which fishing and ship building were prominent, are also documented during the medieval period but have left no trace.

A major medieval industrial activity on the coast was the production of salt at various *saltworks* and *salterns*. As well as documentary references to this activity, physical traces survive in the form of the various salt mounds, especially on either side of the Tees Estuary.

5.9 The early Post-Medieval period

5.9.1 Terrestrial landscapes

For the purposes of this account the early Post-Medieval period is defined as having begun with the accession of Henry VIII and extended down to the middle of the C18. Many of the structures and monuments of the Middle Ages remained in use during this period although the priory church on Holy Island became a naval store and quarry following Henry VIII's dissolution of the monasteries.

A number of industries that later became prominent in the NE experienced some of the early stages of their development at this time, although physical traces of these early phases only rarely survived later developments.

5.9.2 Coastal/Maritime landscapes

The construction of purpose built *lighthouses* began in the latter part of the C17 and was undertaken by enterprising individuals such as Sir John Clayton who built a lighthouse tower on the Farne Islands. A light had previously been shown in the ruins of the priory church at Tynemouth and when this collapsed in 1659 a purpose built lighthouse was erected on the headland in 1664.

5.10 The Industrial period

5.10.1 Terrestrial landscapes

The NE of England was one of the power houses of the Industrial Revolution and traces of industrial activity during the late C18, C19 and C20 centuries are widespread. This activity may be divided into two broad categories, extractive industries and those with a maritime focus. The latter will be considered below. Among the extractive industries coal *mining* and *quarrying* for ironstone, alum (fig. 6.4), jet and aggregates are all represented within the coastal zone along with the infra-structures associated with them. The processing lime often took place on the coast, to facilitate onward transport by ship and *limekilns* are prominent features at a number of localities. Kilns for lime burning can be sub-divided into 'intermittent' or 'continuous' types. In the former case the kiln was charged with limestone, which was then burned and the resulting lime drawn down in a single episode. In the case of continuous kilns, they were charged and burned for weeks at a time. The simplest type of structure was the *clamp kiln* where firing took place in an excavated hollow or pit. *Flare kilns* were permanent masonry or brick structures with a bottle-shaped or domed superstructure. They were generally fired intermittently and fuel and limestone were held in separate compartments. *Draw kilns* were structurally similar but the fuel and limestone charge were mixed and they were fired continuously. Draw kilns are the commonest surviving type and a number of impressive banks of draw kilns survive along the Northumberland coast (figs 9.1, 9.11 and 9.12).

5.10.2 Coastal/Maritime landscapes

It was with the great expansion of industrial activity from the mid C18 that the development of the coastal/maritime landscape of the NE gathered pace. The need to export the products of the region, coal, iron, lime and alum, led to an exponential growth in the provision of harbour facilities and a comparable growth in shipbuilding.

The term *harbour* covers a wide range of structures from simple quay walls, through formally built *piers* to *docks* some of which with gated access to mitigate the effects of tides (figs 7.6, 7.7, 7.8, 7.9 and 8.12). *Coal staites* were specialist structures developed mainly in the NE to facilitate the loading of colliers. They were usually timber jetties of two or more levels. Coal wagons moved along the upper levels and discharged directly into the holds of

vessels moored alongside.

From the earliest times ships had simply been built at the head of the beach and launched over rollers down to the shoreline, but the increasing size of vessels and the industrialisation of the process led to the provision of purpose built *shipyards*. A vast range of ancillary structures were also to be found in shipyards including sheds for timber storage, iron forges, ropewalks and chain lockers.

From time immemorial *fishing* has been a major industry on the NE coast but with the exception of detailed studies of individual ports or vessel types, such as the coble, the archaeology the NE fisheries is yet to be written. Throughout the length of the coastline fishing followed a similar pattern. In the winter the main quarry was white fish such as cod and haddock. Pots were set for crabs and lobsters while salmon and turbot were netted. But the main stay of the NE fisheries was the herring which arrived off the coast in the summer in vast migratory shoals. In the early C19 every beach and small haven provided a base for cobbles engaged in the herring fishery and shore facilities included net sheds, curing houses and smokeries, with the development of kippering in the 1840s. The remains are widespread and include vessels of which there are several types in addition to the coble, such as 12m to 15m keel boats now lying inverted at Holy Island Harbour (fig. 9.14) and various shore facilities mostly now converted to other uses. The dispersed nature of the herring fishery came to an end in the late C19 with the advent of the steam drifter and the industry became concentrated in a small number of major ports, most of which had been developed to serve other, more terrestrial, industries such as coal mining. Several NE ports including Whitby, North Shields and Berwick-upon-Tweed also supported whaling fleets (fig. 9.13).

A complementary industry to that of fishing was the production of salt in *salterns* and *salt works*. This activity has already been noted in a medieval context but with the growth of the fishing industry, particularly the herring fishery in the late C18 and C19, the demand for salt for curing increased exponentially. The evidence for salt making mostly consists of mounds of debris in the case of 'sleeching' which involved the extraction of salt from salt marsh deposits, and documentary references to the existence of salt pans in which the brine was evaporated.

The growth of shipping in the NE stimulated a growth in aids to navigation such as *seamarks* and lighthouses. The simplest form of seamarks are beacons or wood, metal, brick or stone such as the white stone pyramid at Emmanuel Head on Holy Island. These were designed to mark a hazard or provide a means by which a vessel could fix its position. Rather more sophisticated are *leading marks* (figs 7.15 and 9.15). These were usually erected in pairs and were designed to indicate, when aligned, the direction of a safe passage between hazards. These may be simple structures like the poles surmounted by fishing baskets marking the safe entrance to Cullercoats Harbour, or virtual lighthouses such as the High and Low Lights at North Shields (fig. 7.14) In addition, the late C18 and C19 were the great age of lighthouse building.

Features in the 'safety at sea' category include *Lifeboat Stations* (fig. 6.7) buildings associated with the various *Volunteer Life Brigades* (figs 7.16, 7.14 and 8.15) and *Coastguard Stations* (fig. 6.9).

There are numerous *shipwrecks* lying off the coast of the study area, most of which date from the industrial period. In most cases the locations are not precisely defined and are recorded with a general NGR which usually lies outside the study area below LAT. Some shipwrecks have been located above LAT and these are recorded in the assessment (figs 6.8 and 8.16).

5.11 Military Coastal Defences from the C16 to C19

With the exception of the system of Roman signal stations or fortlets, there was no systematic attempt to defend the NE coast until the C16 and the history of coastal defence in the region begins with the reign of Henry VIII when Tynemouth Castle was converted into an artillery fort and the Spanish Battery was established to command to the mouth of the River Tyne. Lindisfarne Castle (fig. 9.9) also dates from this period, built to protect the anchorage and naval base at Holy Island. These developments continued in the C17 with the establishment of a series of gun batteries on the Headland at Hartlepool during the Civil War, the erection of The Fort on the Heugh on Holy Island in 1675 (fig. 9.10) and Clifford's Fort at North Shields in 1672 while a battery had been erected at Hartley (later Seaton Sluice) by 1670. These *batteries* mounted muzzle loading cannons until breach loading ordinance was introduced in the late C19.

In the late C18 the threat of war with the French and attacks by American privateers such as John Paul Jones led to a renewed interest in coastal defence and in the provision of gun batteries to defend the major ports of the NE coast and the concept began to emerge of 'defended ports'. While Tynemouth Castle, Spanish Battery and Clifford's Fort guarded the mouth of the Tyne, Wearmouth was protected by a series of gun batteries on the south bank of the river and probably by one to the north at Roker. No defences as early as this are known from the Teesmouth but the North Battery on the Headland at Hartlepool was brought back into commission at this time while Whitby Harbour was protected by at least two batteries.

Throughout the C19, as threats waxed and waned, coastal defences were updated or mothballed. Major developments were stimulated either by improvements in weaponry, such as the move from muzzle loading cannons to breach loading guns or by the extension of the various port facilities the batteries were designed to protect. The development of the South Dock at Wearmouth made the C18 gun batteries redundant and led to the establishment of the Wave Basin Battery of Rifled Muzzle Loading (RML) guns at the river mouth. Similarly, the construction of the outer piers at Tynemouth at the end of the C19 made Clifford's Fort obsolete and led to the upgrading of the guns mounted at Tynemouth castle.

5.12 Military Coastal Defences in the Modern Period

5.12.1 World War I

Few WWI features survive and this is probably because many sites and installations were also occupied during WWII. Examples of this situation are provided by the remains of the Royal Flying Corps airfield at Marske, which lie to the NW of the more extensive but built

over remains of the WWII airfield, and the Coulson Battery at Blyth which was manned in both wars and includes the WWI control building alongside its WWII replacement (figs 7.19 and 7.20).

Several C19 gun batteries also saw service during WWI including the Heugh Battery at Hartlepool which gained distinction on 16th December 1914 when it engaged three battle cruisers of the German High Seas Fleet then in the process of bombarding the town. The weaponry deployed at this time usually consisted of 9.2 inch and 6 inch guns mounted on open concrete emplacements and 12 pdr and 6 pdr quick firing guns covering harbour entrances and narrow channels. A development, initiated during the War but remaining uncompleted at the end was the emplacement of two 12 inch battleship gun turrets to the north and south of the mouth of the Tyne, the so called 'Tyne Turrets'.

5.12.2 World War II

Features that can be dated to WWII can be divided into those that were designed for defence against bombardment or to confront an invasion, though the two categories are not mutually exclusive. The following accounts are mainly based on the details to be found in Brown *et al* (1996).

5.12.2.1 Coastal Defence Batteries

Coastal defence batteries were designed to fire on ships and landing craft. In many cases they were facilities recommissioned from WWI and deployed the same calibre ordinance. Structures consisted of the gun emplacements themselves, now usually roofed over to provide protection from aerial attack, a Battery Observation Post (BOP), magazines, generator buildings, searchlight emplacements and accommodation for the gun crews. The whole might lie within a barbed wire perimeter defended by pillboxes and weapons pits (figs 7.19 and 7.20). Following the evacuation of Dunkirk in June 1940 the existing batteries were supplemented by a number of *Emergency Coastal Defence Batteries* equipped with 6 inch, 5.5 inch, 4.7 inch and 4 inch guns naval guns.

5.12.2.2 Heavy Anti-Aircraft Batteries

Once the likelihood of a sea borne or air borne invasion had passed, by the end of 1941 aerial bombardment posed greatest threat. To combat this threat major installations and ports were provided with batteries of heavy anti-aircraft guns.

The standard weapons deployed at these sites were 4.5 inch or the 3.7 inch guns. As initially built, batteries usually consisted of four emplacements arranged in a 'clover-leaf' arc around a battery command post with, occasionally, two additional emplacements set to one side or at either end of the arc. Other facilities included magazines, accommodation for the gun crews and a platform for a gun laying radar unit. The emplacements themselves can be of a variety of shapes and where more than one type is found on a site this might imply developments during the course of the war, the original 4.5 inch guns being replaced from 1943 onwards by improved 3.7 inch weapons (figs 7.21a and 7.21b).

5.12.2.3 Searchlight Emplacements

Typically, searchlight emplacements consisted of a circular earthwork 9m in diameter for a 90cm light, a predictor emplacement, a generator, accommodation for the detachment and at least one light anti-aircraft machine gun pit. Searchlight emplacements generally only survive as crop marks (fig. 9.17).

5.12.2.4 Barrage Balloon Sites

As well as anti-aircraft artillery major centres of population, industry and ports were protected by barrage balloons. These balloons were intended to make enemy aircraft fly higher, thus diminishing the accuracy of their bombing and divert them towards the air-aircraft batteries. From the APTE transcriptions these sites can be seen to consist of a series of concentric rings for the tethering of the balloon itself and for anchoring the lines that extended below it to deter under flying. It is unlikely that any trace will survive to the present day.

5.12.2.5 Bombing Decoys

As an alternative to engaging enemy aircraft or forcing them to fly higher, attempts were made to divert their attention through the use of bombing decoys. These were ground installations configured in such a way as to confuse enemy pilots and encourage them to waste their bomb load on meaningless targets. Two types were regularly deployed. 'QF' sites were established to provide mock fires to give the impression that the area had already been attacked while 'QL' sites attempted to simulate street lighting, marshalling yards and dock facilities. A detailed study of decoys has been made by Dobinson (2000) and his gazetteer of sites will be referred to in addition to the HER and APTE records (fig. 8.17).

5.12.2.6 Radar Stations including 'Chain Home Low' sites

Radar stations usually consisted of four elements, a transmitter (TX) block, a receiver (RX) block, a power supply and bases for the aerials. There would also be accommodation for the operators. The 'Chain Home' system was the backbone of radar provision in WWII, two types being deployed, a 'West Coast' Type and an 'East Coast' Type. It is the latter that is found in the NERCZA study area and the receiver block can be identified by finding the concrete bases for the four towers that surrounded it whereas the transmitter block should have bases for a line of towers at 55m intervals. 'Chain Home Low' (CHL) sites were developed to detect low flying aircraft and from 1942 onwards the receiver and transmitter were housed in a single structure. A particularly well preserved CHL site at Dunstanburgh is described in Chapter 8.

5.12.2.7 Air-raid shelters

As a last resort the civilian population and military personnel could retreat to purpose built air-raid shelters of which several types were built including trench shelters for multiple occupancy and the famous *Anderson* shelters erected semi-sunken in thousands of back gardens.

5.12.2.8 *Beach Defence Batteries*

Once an enemy was on the beach the heavy calibre weapons of the coastal defence batteries were of little use and responsibility fell to beach defence batteries to hold the beach and prevent an incursion inland. The weapons deployed often consisted of a single 3 pdr or 6 pdr anti-tank guns in a concrete pillbox or earthwork emplacement. A good example of this kind of deployment is provided by the Druridge Bay Defence Area discussed in Chapter 8.

5.12.2.9 *Pillboxes and Section Posts*

Concrete pillboxes, and the rather less common section posts are the most familiar defensive structure encountered on the coast. They are the classic example of a protected position from which troops could engage the enemy, and a number of different types can be identified (fig. 8.18). They were either sited tactically to command a particular point of vulnerability or in groups as part of a wider system. Most notable of the latter are the pillboxes on strategically sited Stop-Lines. Hundreds of pillboxes are recorded in the NERCZA study area and many survive to the present day. A comprehensive study of these features lies beyond the scope of the present project and the existence of most pillboxes is simply noted in tabular form. However, in two cases a more detailed study has been undertaken. Chapter 6 includes an account of the section posts forming the Defence Area at Greatham Creek while the arrangements at the Defence Area at Druridge Bay are described in Chapter 8.

5.12.2.10 *Anti-tank Obstacles*

Lines of concrete blocks are the most commonly encountered anti-tank obstacles, though ditches and solid walls pierced with embrasures were also deployed (fig. 9.16). During the war these were supplemented by beach scaffolding and *minefields*. These latter defences were cleared once the threat of invasion had passed, though they can often be identified on wartime aerial photographs.

5.12.2.11 *Anti-glider Obstacles*

Added to the threat of a sea borne invasion the possibility of an enemy arriving by air, either by parachute or the landing of troop carrying gliders, had to be considered. The latter concern was addressed by the construction of anti-glider obstacles at likely landing sites. These consisted of lines of concrete blocks similar to anti-tank obstacles but incorporated within a system of earthwork ditches and banks. The APTE has identified three types of provision. The simplest variety consisted of single or parallel lines of obstacles up to 150m long and 10m wide. When set in groups, they were about 100m apart. Variations on this arrangement include discrete segments and sections with a 'dog-leg' bend in the middle. A more complex variety consisted of an arrangement of intersecting obstacles forming a regular lattice pattern, the lattice being about 150m square. A third system consisted of a combination of simple and lattice arrangements but also incorporated enhanced natural features.

5.13 Conclusion

This completes the review of the principle types of historic asset encountered on the NE coast. The following four chapters review these remains in detail, aerial survey Block by Block, and note the extent to which individual assets and groups of assets should be considered to be under threat from coastal erosion. The approach by which these threats has been assessed was set out in Chapter 2 while Chapter 10 offers some thoughts on the scope for further work.