Dover Sewers/A20 Project 1991–3

Assessment Report and Updated Project Design

Canterbury Archaeological Trust, January 2001

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1) General Introduction

1.0 The Importance of Dover

1.0.1 The historic town and Cinque Port of Dover lies on the coast of south-east Kent, at the shortest crossing point of the English Channel to the Continent. As a consequence of its geographical location, Dover has been of prime importance as a port since Roman times and probably earlier. Today, it is the busiest passenger port in the world. The town itself shelters within the steep-sided valley of the little river Dour, at whose mouth the early haven was situated. On the hill, above the eastern side of the town, the great medieval castle provides the clearest statement concerning the crucial strategic position of the place. Less obvious to the casual observer are the even more extensive nineteenth century fortifications on the Western Heights opposite. Archaeological excavations within the valley have revealed the former presence of two successive Roman forts here and it is suggested that an earlier Iron Age hill-fort could lie below the castle, all of which further underlines the key strategic importance of Dover.

1.0.2 Without doubt, the River Dour has been central to Dover's existence from the beginning, once providing both a sheltered haven for shipping at its mouth and a constant supply of fresh water for local inhabitants. The original estuary, however, has long since been choked with silt and shingle and much of medieval and modern Dover was built across deep layers of sediment which in-filled the site of the ancient haven.

1.0.3 The impressive extent and preservation of buried archaeological remains under Dover was amply demonstrated by large-scale excavations conducted by the Kent Archaeological Rescue Unit (KARU) during the 1970s and 1980s (Philp 1981; Philp 1989; Philp, n.d.) and has been reaffirmed by the Canterbury Archaeological Trust's work on the A20 and other sites since 1991 (Parfitt 1992; Parfitt 1993).

1.0.4 Recognising the importance of the town's buried archaeology, Dover District Council (DDC) set up in 1989 the Dover Archaeological Advisory Board, under the chairmanship of Professor B. Cunliffe and in 1990 commissioned from the Oxford Archaeological Unit a general overview and archaeological implication survey for the town (Wilkinson 1990a). This report highlighted the importance of the buried remains preserved under many areas of old Dover. For the purpose of identifying the character and potential of these various areas, the town was sub-divided into 11 separate archaeological zones (lettered Zones A-L, no I). From this study it was apparent that, although certain zones of the town had seen extensive excavation work, others had seen very little, or none at all. At the same time, DDC engaged the Geoarchaeological Service Facility (GSF) of the London Institute of Archaeology to assess the potential of the palaeo-environmental evidence preserved within the Dour valley. That report indicated that the geological sediments contained within the bottom of the valley were likely to be of great significance for future research (Barham and Bates 1990).

1.0.5 *Conclusion*

The above paragraphs make it readily apparent that both the history and the archaeology of Dover are very much concerned with the evolution of the haven/port at the mouth of the Dour, and the defence of that port, with its adjacent coastline, from foreign invaders.

1.1 The Dover Sewers/A20 Project, 1991-1993

1.1.1 The Dover Sewers/A20 project consisted of a major archaeological watching brief and excavation programme conducted across an extensive part of the maritime and water-front areas of this highly important historic town, between the summer of 1991 and the spring of 1993. The work was undertaken by the Canterbury Archaeological Trust (CAT), with the assistance of the Geoarchaeological Service Facility (GSF) of the Institute of Archaeology, University College London, ahead of major road construction and deep sewer trenching.

Overall, the urban section of the new A20 route comprised a construction corridor some 2 kilometres in length and up to half a kilometre in width. The line of the new road and its related sewer works affected much of Dover's seaward flank, cutting through most of the maritime districts of the old town. Collectively, the works affected about 25% of the total area of the historic town, together with several significant localities (DS/L, F, H & G, see below) just beyond.

Excavations and observations were made at 110 individual locations along the route. Twenty-one of these interventions were conducted by CAT staff and eighty-nine by the GSF team. The CAT investigations were concerned with the recording of archaeological remains ranging in date from the prehistoric period to the Second World War. The GSF work was largely concerned with the investigation and interpretation of natural sediments infilling the valley/harbour basin and how these related to the recorded archaeological remains. The palaeo-environmental work included the drilling of several bore-holes to examine deeply buried deposits in the valley bottom (Fig. 3).

1.1.2 Despite the extent of the construction works proposed, no provision for any archaeological investigations had been included in the original environmental impact assessment and the effect that the ground-works might have on buried archaeological deposits had not been brought to the attention of either the Department of Transport or Southern Water Services, the principal developers. Shortly after the contractors had begun preliminary operations, the Canterbury Archaeological Trust (CAT) became aware of the situation and was able to step in and rapidly prepare an archaeological impact assessment of the scheme for English Heritage (Parfitt 1991). English Heritage recognised that the likely impact of the project, as set out in this report, was of sufficient importance to warrant immediate action and readily agreed to grant-aid the field-work, at a cost of £241,522. An additional grant of £11,000 was received from Southern Water Services to cover works specific to the new sewer laying programme.

1.1.3 Since the evolution of the Dour estuary is crucial to the understanding of the development of the port and settlement at Dover (see **1.0** above), and the exposure of ancient estuarine sediments of considerable palaeo-environmental interest seemed certain, the Trust sought to include a substantial element of geoarchaeology in the brief and for this the services

of the Geoarchaeological Service Facility (GSF) of the London Institute of Archaeology were enlisted. The GSF team had previously undertaken work in the Dour valley (see 1.0.4); their original report concluded that 'The combination of high sedimentation rates, fed by geological subsidence... and a concentration of historic and prehistoric occupation around a restricted area suggests stratigraphy beneath the modern town centre is of unique significance in the context of south-east England' (Barham and Bates 1990, 115).

1.1.4 The Department of Transport made all necessary arrangements for the incorporation of an archaeological element in the works programme and a team from the Canterbury Archaeological Trust and the Geoarchaeological Service Facility was rapidly put in place, with a brief to observe all ground-works and to undertake investigations where and whenever this might prove possible. A team of between two and six Canterbury Trust members were employed for than 500 consecutive days in the field. It was recognised from the outset that due to the prevailing circumstances the project could not be treated as a standard archaeological field project.

A highly flexible approach to the field-work was clearly required and it was readily apparent that working conditions would be difficult, to the point where some archaeologists might have considered the entire project as untenable. Nevetherless, it was equally clear that the prospects for the recovery of some very useful archaeological data from were extremely good, especially since much of the area affected by the construction work lay in those areas of the town that had seen very little or no previous archaeological work (see above).

The Trust began field-work in June 1991 and very considerable amount of significant information relating to many aspects of the history of Dover, together with valuable evidence concerning the evolution of the river estuary, was recorded. The field-work may thus be considered to have been highly successful. As predicted, its particular strength was the broad coverage of substantial areas of archaeologically unknown parts of the town.

1.1.5 The road works and sewer trenches affected considerably larger areas of the town than was originally envisaged and culminated in the excavation of a massive underpass at the end of Bench Street, close to the heart of the historic town (Fig. 2). On several occasions, generally in response to unexpected engineering problems, various excavations (usually in the form of 'temporary works') were made in areas well away from anything shown on the original engineer's drawings. Thus, the scope of the field-work being undertaken had to be expanded accordingly. Moreover, the pace of the main building contractor's work was rapid once it had begun. This, together with the delayed demolition of existing buildings along the route, limited the number and extent of the formal excavations that could be undertaken ahead of the construction work, with several potential sites either being obstructed by standing buildings, or upon their demolition, occupied immediately by the contractors. As the construction work progressed, a highly flexible strategy in the field had to be developed which allowed an instant response as new excavations were made by the contractors, quite frequently in unexpected locations and often at some distance from current working areas. With generally between four and eight individual working areas existing on the route at any one time constant archaeological patrols of the road corridor were required on a regular basis (Fig. 1). A close working relationship with the site engineers and workmen was developed and this proved

most useful (to both parties) on numerous occasions. Frequently, unforeseen engineering difficulties held up the contractor's programme and allowed access for archaeological work which could not otherwise have been undertaken.

1.1.6 With such an opportunistic approach to the recording of the archaeological remains at Dover, belonging to many different periods, clearly defined general research themes and objectives needing exploration were required in order to guide the collection of data in the field. This was considered to be absolutely essential since without such a strategy much of the recorded information could never become anything more than a miscellaneous assemblage of unrelated details, without any clear historical value. Nevertheless, much of the construction work was taking place in areas that had seen little or no archaeological work in the past so that the likely nature and quality of the buried remains was often completely unknown. In these uncharted regions even the most basic field observations were of considerable value and they remain particularly useful for assessing future threats to the archaeological resources here (Research Objective 13, see below).

1.1.7 With such a large area (*c.*25%) of the historic town affected by the construction work it became apparent at an early stage that some broad research issues concerning the town as a whole could be considered. This wide-ranging approach was pursued throughout the course of the field-work and is closely reflected in the research objectives set out below. The extensive archaeological work undertaken along the road corridor yielded a considerable amount of significant information relating to many aspects of the story of Dover, particularly in the medieval and post-medieval periods. Of necessity, a significant proportion of the information recovered is fragmentary and of limited value on its own, but the great strength of this data-base is its broad coverage of substantial areas in the maritime quarters, together with a key block of ground about 100 metres square, adjacent to the heart of the medieval town, centred on Bench Street. Given the nature and extent of the field evidence recovered from the A20, a themed approach to the study and interpretation of the data has always seemed generally rather more appropriate than site specific studies.

1.1.8 The investigation of two broad topics, both central to research on the historic town - the evolution of the port at Dover and the defence of that port through time (see above) - were pursued through-out the project. These broad themes were considered in conjunction with the more specific research studies proposed by Wilkinson (1990, 30). A high priority was given to palaeo-environmental work throughout since the silting of the Dour estuary is fundamental to the understanding of the evolution of Dover's port facilities. In turn, the evolution of the harbour has had a strong influence on the location and extent of the contemporary settlement, so that the two subjects are totally inter-linked.

1.1.9 A detailed assessment report on the findings of the Dover Sewers/A20 project, with proposals for a broad range of further analysis work, was submitted to the Highways Agency in June 1995 (Barham *et al* 1995). The ambitious palaeoenvironmental and geoarchaeological proposals contained within this document were felt to lie outside the remit of the project brief, however, and further post-excavation work on the project was thus postponed.

1.1.10 In the autumn of 1998 English Heritage (EH) invited the Canterbury Archaeological Trust to undertake a revision of the original assessment document. This new report was intended to define the most important elements of the data recorded during the Dover Sewers/A20 project and to provide an integrated, more stream-lined, Revised Assessment Report and Updated Project Design. It was hoped that a more focused approach to the analysis of the recorded A20 field evidence, taking account of research undertaken since 1995, would substantially reduce costs and this was a major consideration throughout the reassessment phase (Parfitt and Keeley 1999). This revised report was prepared by Keith Parfitt and Helen Keeley; it was completed by the end of 1999, being submitted to EH in December of that year and was up-dated again in January 2001.

1.2 Developments in Dover since the completion of the A20 field-work

1.2.1 Since the completion of the A20 field-work, now more than seven years ago, there have been significant developments in archaeological research, both nationally and locally. Locally, in the wake of the new A20 highway has come a range of re-development projects adjacent to the road corridor. Many of these have had significant archaeological implications for the historic town. As a consequence, a number of new sites have been investigated and a permanent office of the Canterbury Archaeological Trust has now been established at Dover. Driven by the need for a complete revitalisation of the town, continued re-development of land adjacent to the A20 seems likely and several major new building projects are currently in various stages of planning.

1.2.2 Of particular significance for the archaeology of Dover was the large-scale excavation occasioned by the construction of a new BP filling station on the line of the A20 (Townwall Street) at its junction with Woolcomber Street. Here, a complex, well-preserved sequence of twelfth-thirteenth century chalk-floored timber houses and out-buildings was revealed in 1996. Numerous fish bones and fish-hooks suggest that these structures belonged to fishermen. The buildings occupied plots laid out on either side of old Clarence Street. Many individual property boundaries had hardly changed over many centuries. A few later medieval stone buildings were recorded but there was a marked hiatus in occupation after *c.* A.D. 1275. Several post-medieval structures occurred, including an eighteenth century malting kiln. Some 40,000 pot-sherds mostly ranging in date from the twelfth and thirteenth centuries were recovered. The significant number of imported wares reflect links with the Continent. Large quantities of animal and fish bone were also found, together with over 2000 small-finds. Although resources have not been available for an exhaustive study, a detailed monograph report, concentrating on the medieval buildings and their associated finds, is nearing completion.

1.2.3 When published (proposed date 2007), the Townwall Street report will constitute the first major study of a medieval site within the town of Dover. As a consequence of this, a significant amount of general background material has been included within the volume in order to provide a context for the excavated remains. The detailed pottery study provides a sound basis from which medieval ceramic studies for the town may now be developed. The assemblage has been used to create, for the first time, a Fabric Series for Dover. Our knowledge of the medieval town will thus be greatly advanced.

1.2.4 This increase in knowledge of medieval Dover has a direct affect on the rather more fragmentary field evidence previously recorded during the A20 project, especially in the Bench Street area. In particular, it now seems clear that the chalk floors recorded there in 1991-3 must also represent the remains of timber structures of very similar form to those investigated at the Townwall Street site. Other aspects of settlement around Bench Street, however, stand in contrast to findings at Townwall Street.

Activity at Bench Street began earlier, some time during the later Anglo-Saxon period and has continued more intensively and uninterrupted until the present day. A number of substantial late medieval stone buildings seem to have superseded the original timber structures here, suggesting that this became an important area of medieval Dover. The Townwall Street site seems to have been more peripheral. The refinement of the dating of the pottery recovered from Townwall Street will allow some revision of the dates originally assigned to material from the A20 sites.

1.2.5 Opportunities for the further investigation of the deeply buried sediments within the bottom of the Dour valley, that were examined in some detail during the A20 project, have been limited since, due to the great depth of over-burden, the difficulty of gaining access to the appropriate areas and the general lack of funding. Some limited work has been undertaken along Northampton Quay, immediately to the south-east of the A20, however, and a deep section through the modern river bed was obtained from a pipe trench off Mill Lane. Both these projects revealed deeply buried riverine sediments directly comparable to those recorded around the Bronze Age boat found during the construction of the A20. The sediments associated with the boat have now been investigated in detail as part of the EH funded Dover Bronze Age boat analysis project (Clark forthcoming). Clearly adding to the emerging picture, the most recent observations need to be correlated with the more extensive results of the A20 work, which will continue to provide the main corpus of data available, with seemingly little potential for much future work on this scale. Some further work on the sediments infilling the Paradise Basin below Archcliffe has been undertaken for the Wessex Archaeological Trust (Wessex Archaeology 1999).

A summary of the stratigraphic sequence along the A20 route was provided by Bates and Barham in the original 1995 assessment. However, since then there has been more analysis work in Dover, e.g. on sediments from the site of the Dover Bronze Age boat (Keeley, forthcoming) and the Western Docks (Palmer, Toms, Green and Branch, 1998). The summary has now been updated by Bates (1999a; 1999b) and this is outlined below.

1.2.6 There has been some further work on the historic documents relating to Dover. Dr Mary Dixon has undertaken a considerable amount of work on the sixteenth and seventeenth century records (Dixon 1992) and has noted a number of details of direct relevance to A20 discoveries, in particular relating to the sixteenth century Three Gun Battery. Dr Sheila Sweetinburgh has made a detailed study the medieval documents associated with the Mason Dieu hospital situated on the outskirts of the town. She has also recently undertaken documentary studies for CAT concerning the evidence relating to the construction of the medieval town wall and the medieval fishing industry of the town. Both these studies will be of direct relevance to the A20 work.

The borough records relating to Dover are split between the British Library and the East Kent Archives Centre recently opened at Whitfield, near Dover. The documents held at Whitfield have now been re-catalogued in detail and should allow easier access for research of any A20 related topic.

1.2.7 When the previous Dover Sewers/A20 assessment and UPD were submitted to the Highways Agency in June 1995, it was assumed that the palaeo-environmental analysis would be undertaken by GSF, who at the time held all the samples and associated documentary records which they had collected during the field-work. However, GSF has now ceased to exist and CAT has only recently been able to gain access to the environmental archive. The current proposals thus recognise the need to integrate all the available data in order to reflect the closely inter-linked nature of the evolution of the port and the settlement at Dover.

1.2.8 Field recording and sampling for the palaeo-environmental work on the A20 project and the preparation of assessment reports was carried out under the direction of staff of the Geoarchaeological Service Facility (GSF), University College London. The assessments were carried out soon after the excavations in response to the original palaeo-environmental aims and objectives of the A20 project at that time, which were predominantly focused on a general interpretation of the landscape history of the Dour Valley and its catchment. In producing the revised assessment and updated project design we have formulated more detailed questions, relating specifically to the archaeology of Dover town. Fortunately, the majority of samples selected initially for assessment are relevant to these archaeological questions, although the results have not necessarily been interpreted by the specialists with these questions in mind. Also in some cases, e.g. for the insect remains, only a few, rather small, samples have been assessed.

Recent revision of the assessment reports has allowed the specialists an opportunity to review and recast their data. However, the resources available for this have been extremely limited and there has been no opportunity to re-visit the material and only limited scope to rework the data in the light of the revised project aims and objectives. Thus it has proved difficult, as it did with the Dover Bronze Age boat (Clark and Keeley 1997), to present the results as a conventional MAP2 assessment but we feel that enough information is available on which to base a statement of potential for the analysis programme.

1.2.9 Planning Policy Guidance Note No. 16 is now well established within the local planning procedure. As an aid to planners the preparation of an Urban Archaeological Database for Dover is proposed. The creation of this will be funded by English Heritage and it seems clear that many of the observations made during the course of the A20 road-works will be ideally suited for inclusion into such a database. This will remove the need to produce separate, detailed archive reports on these discoveries, as originally envisaged, and so will consequently reduce the amount of work and the cost of the present project.

1.2.10 The problems of resurrecting such a major project as Dover Sewers/A20 Project after a considerable lapse of time and following the demise of one of the principal agencies concerned with a substantial part of the original field-work, has raised not insignificant difficulties. Large

numbers of soil samples and archive records have had to be located in London, moved to CAT and Dover Museum storage facilities in east Kent and then re-sorted and collated. Nevertheless, the results of the original field-work still provide some highly important evidence and this may now be viewed in a rather more enlightened way, following the recent archaeological work and research within the town (see above). Several recent developments have, or will, allow research originally proposed for the Dover Sewers/A20 project to be funded and undertaken by others, so reducing costs to the present project. A detailed published account of the principal discoveries made along the A20 road corridor, however, remains an important final goal.

2) Aims and Objectives of the Dover Sewers/A20 Project

2.1 Research Aims and Objectives
Prior to the beginning of the Dover Sewers/A20 field-work, a number of research objectives were identified which it was hoped that the investigations could address. They are presented below, together with additional research objectives that emerged during the course of the original assessment.

Since the new road corridor ran across substantial parts of the maritime and water-front areas of the historic town, it provided a good opportunity to undertake investigations concerned with the development of these otherwise little known regions. Indeed, with such a large area of the historic town affected (*c*.25%) some broader research issues concerning the town as a whole could be also considered. This wide-ranging approach was pursued throughout the course of the field-work and is closely reflected in the research objectives set out below.

The extensive archaeological work undertaken along the road corridor yielded a considerable amount of significant information relating to many aspects of the history of the Dover, particularly in the medieval and post-medieval periods. The research of two broad topics, namely the evolution of the port facilities at Dover and the defence of the harbour through time, were pursued throughout the course of the A20 field-work. These were considered in conjunction with the more detailed research studies proposed by Wilkinson (1990, 30). A high priority was given to palaeo-environmental work in the field since the silting of the Dour estuary is fundamental to the understanding of the evolution of Dover's port facilities and the consequent evolution of the town.

2.2 Specific research questions formulated at the start of the Dover Sewers/A20 project:

2.2.1 *How has the topography and environment of Dover changed from prehistoric times to the present? What influence has human activity had on those changes ?*
It is clear that there have been major changes to Dover through the centuries. There are perhaps two principal causes of these changes. Firstly, the town is confined within a narrow, steep-sided valley with limited space to expand. Pressure for building land has meant that old structures have generally been removed or built over, rather than worked around. Secondly, there have been major changes to the nature and position of the river estuary. There seem to have been periods of deposition and coastal erosion, causing significant local shifts in settlement location. Large areas of old Dover were damaged by bombing and shelling during the Second World War. Following some extensive re-development in the 1950s and 1960s, it is now impossible to reconstruct anything of the pre-war town layout on the ground in a number of areas, not least the Pier District and Woolcomber Street area.

The Dover Sewers/A20 project was expected to yield a range of significant data relevant to this broad research question.

2.2.2 *What form did the Roman harbour take ? How did it disappear and why did infilling occur ?*
The existence of a significant Roman settlement at Dover has long been known and excavations in the 1970s and 1980s immediately to the north of the present area revealed the remains of an

almost unique Roman naval fortress, in addition to the long postulated late Roman Shore Fort and numerous other significant structures (Philp 1981 and 1989). The prime importance of Dover as a port in Roman times has always been clear. The remains of the only two known Roman lighthouses in Britain stand on the hills on either side of the valley.

Rather less is known about the arrangement of the actual harbour installations themselves. These were clearly fundamental to the origins and continued survival of the Roman settlement, with the topography and natural infilling of the river estuary being key factors in determining their form and evolution; yet all these matters are still very imperfectly understood. Traces of probable Roman harbour works have been discovered at various times in Dover for more than a century (Rigold 1969). The principal discovery, ill recorded in the extreme, was made in 1855-6 when a huge timber harbour wall or mole was discovered during deep excavations for a large gasometer off Dolphin Lane. A Roman quayside was hastily recorded by Rahtz some distance further to north in the 1950s (Rahtz 1958).

Wilkinson (1990) has listed the study of the Roman harbour as a key research objective for the archaeology of Dover and it was hoped that palaeo-environmental investigations on the Dover Sewers/A20 project would provide some useful new information about the location and extent of the Roman harbour basin.

2.2.3 *Where was the Anglo-Saxon settlement and harbour? What form did it take ?*
The Anglo-Saxon settlement at Dover seems to have been established by the sixth century and by the mid-tenth century Dover possessed a mint, which provides good evidence for the existence of a sizeable community here at this time (Tatton-Brown 1984, 22). The exact position of any Anglo-Saxon harbour is unknown but, at least in the early Saxon period, it probably occupied the surviving Roman installations east of the Shore fort, possibly with some sort of detached 'wic' settlement further to the west. The port at Dover must have continued to form an important facility because by the late Saxon period the town had risen to become the head of the Cinque Ports confederation.

Despite its importance, as indicated by the documentary evidence, details of the archaeology of Anglo-Saxon Dover are scarce. The substantial body of information relating to this period from the excavations of the 1970s and 1980s is not yet available for study and there has been no other recent work, so that the archaeology of the pre-Norman settlement remains unknown in detail.

It was hoped that work on the Dover Sewers/A20 project would provide some useful new information about the location and extent of the Anglo-Saxon settlement and harbour basin. It was anticipated that much of this data would be in the form of negative evidence, so helping to narrow-down the likely location of key areas.

2.2.4 *Where was the medieval harbour and what form did it take ?*
Seafaring was clearly of major importance to Dover throughout the medieval period. Like the Anglo-Saxon haven before it, however, the precise position and size of the town's medieval harbour remains uncertain. The old Roman haven must have been completely silted-up by the Norman period. Medieval French historian William le Breton records that a large fleet assembled by the King off Dover in 1216 had been scattered by a great storm 'to various

harbours, because the coast at Dover had none' (Michel 1840, 168). From this it may be inferred that facilities at Dover were then very limited, perhaps at best only a small haven used by the local boatmen.

Investigations on the Dover Sewers/A20 project could provide some useful information about the location and extent of the medieval harbour basin and might possibly reveal quays and water-front structures.

2.2.5 *What can be learnt about the economy of the town in the Anglo-Saxon and medieval periods ?*
In the absence of any recently published material, there is very little direct archaeological evidence for the Anglo-Saxon and medieval town's economy. Documents indicate that the bulk of the townsfolk were concerned with maritime activities, particularly fishing and the ferrying of passengers and goods across the Channel. Dover was a member of the Cinque Ports confederation; this seems to have originated in late Saxon times as a loose association of maritime towns, scattered along the coast of south-east England, which came together to provide ships and men for the service of the King, in return for certain privileges. These towns all had harbours and seaworthy fishing fleets manned by skilled sailors. The arrangement was continued long after the Conquest, making these towns important and prosperous places.

The location and excavation of some well-stratified deposits on the Dover Sewers/A20 project would hopefully yield useful assemblages of material, including pottery, animal bone, fish bone etc. that could be used to address this question.

2.2.6 *What was the nature of the medieval town ?*
Following the decisive victory at Hastings in 1066, Duke William and his army rapidly marched along the south coast to occupy existing fortifications at Dover. It is recorded that the town was destroyed by fire at this time. The subsequent Norman town seems to have developed on the western side of the valley, mostly across the site of the earlier Roman and Anglo-Saxon settlements.

The overall size of the town in Norman times remains unclear but it does not seem to have been very extensive. The information relating to this period from excavations of the 1970s and 1980s is not yet available for study and there has been no significant other recent work, so that the archaeology of the Norman settlement remains unknown in detail.

The location and excavation of dated structural remains on the Dover Sewers/A20 could provide data that may be used to address this question. It was anticipated that negative evidence would useful in helping to narrow-down the likely location of the main settlement area.

2.2.7 *What was the nature of the medieval town wall and gates?*
Independent of the massive Royal castle, the town of Dover was defended, from the fourteenth century, if not earlier, by its own stone-built curtain wall with towers and gateways. The wall may have enclosed a sub-triangular area of roughly 6.5 hectares on the west side of the River

Dour, with a spur wall on the seaward side that ran eastwards towards the Castle Cliffs, providing additional defence for the suburbs around St James' church.

Today, nothing of Dover's defences survives on the surface other than references to it in a few street names such as Townwall Street, Snargate Street and Cowgate Hill. The exact line of the defences is now generally very difficult to establish. Neither the precise course, nor the construction date of the wall is known in detail. The curtain is likely to include several phases of development. Six or seven gateways are believed to have led through the seaward wall giving access to the shore and harbour installations.

From what was known about the line of the town wall it seemed probable that traces would be exposed during the Dover Sewers/A20 project. The remains of several gates could also be exposed.

2.2.8 *How was Dover provided with pottery during the medieval and post-medieval periods ? Are trading links reflected in its pottery supply?*

In 1991, despite the significant amounts of pottery recovered from earlier excavations, Dover had seen remarkably little modern pottery research. The few small groups previously published suggested the presence of a significant range of imported wares here, such as would be consistent with the town's status as a major cross-Channel port, but the geographical and chronological extent of such imports remained unclear.

Detailed analysis of some major stratified assemblages, ideally from different parts of the town and of different dates, was urgently required to advance ceramic studies. The Dover Sewers/A20 project would hopefully provide some useful groups that could be used to address this research objective.

2.2.9 *What was the nature of the post-medieval harbour works in the Pier District ? How did the Pier District develop ?*

According to the documents, at the end of the fifteenth century a completely new harbour was established on a virgin site almost one kilometre to the west of contemporary town. This new haven was created within a small bay at the foot of Archcliffe Point, at a spot where fresh-water springs flowed from the adjacent chalk cliffs into the sea. Protected by a pier built by Sir John Clark and defended by two stone-built gun towers, this new harbour, referred to officially as "the Wyke", initially functioned very well and quickly earned itself the name "Paradise". Through long-shore drift, shingle soon accumulated on the seaward side of Clark's pier which strengthened it and provided firm land on which to build.

From the sixteenth century onwards houses began to be constructed adjacent to the Paradise harbour in increasing numbers, ultimately giving rise to a major new settlement, which became known as the 'Pier District'. The establishment of these harbour works in the early post-medieval period led to a marked westerly shift in the settlement focus at Dover and effectively created a 'town within a town'. By the mid nineteenth century, however, the entire harbour area had been filled in and built over to become part of one of Dover's most densely populated areas. Today, virtually all traces of this once busy maritime quarter of old Dover have disappeared (Fig. 12). The history of the Pier District is thus known almost entirely from

documentary and cartographic evidence (Biddle and Summerson 1982; Macdonald 1938). There has never been any archaeological investigation of the region.

Archaeological investigation of this important but previously unexplored area of early post-medieval Dover was seen as a key objective of the Dover Sewers/A20 project as some major construction work was to be undertaken in this area.

2.2.10 *What was the nature of development along Snargate Street, linking the Pier District and the old town? When did this take place ?*

Occupying a somewhat isolated position well to the west of the main town, the Pier District seems to have developed between the sixteenth and nineteenth centuries. Snargate Street, running along the beach below the chalk cliffs, provided the only link between these two areas of Dover. In the nineteenth century it formed the town's principal shopping street.

As with the Pier District, some archaeological investigation of this significant but previously unexplored area formed a key objective of the Dover Sewers/A20 project. The establishment of the date of the earliest settlement here was seen as being important.

2.2.11 *What can be learnt about clay tobacco pipe industry of Dover ?*

There has been no detailed study of the town's clay tobacco pipe industry, although some documentary records are available suggesting several manufacturers were established in the Limekiln Street area. A large amount of material comes from earlier KARU excavations in the town but this has never been studied or published and there is no established type sequence of pipes for the town.

Since Limekiln Street fell within the area affected by the Dover Sewers/A20 project it was hoped that some evidence for this post-medieval industry would be revealed.

2.2.12 *What can be learnt about the later military defences of Dover ?*

The defence of the port at Dover has been of key importance since Roman times. Although some significant monuments survive, damage has occurred to many of these and a number of other sites have completely disappeared. The exact nature and form of many of these remains is thus unknown.

Two upstanding monuments, in the form of the South Lines Battery and Archcliffe Fort, lay on the line of the new A20. It was anticipated that archaeological examination of these would add significantly to our knowledge.

2.2.13 *Can information obtained during the A20 study be used as a predictive tool to assist decision making regarding future planning and development strategies within the town ?*

In a detailed study of the surviving archaeological resources of the town, Wilkinson (1990) has identified a series of zones of archaeological potential. The nature and extent of the remains in many of these areas is unknown in detail, since there has been little or no excavation here. The A20 road scheme ran through archaeological Zones E, D, C, F and G. Of these, Zone C was regarded as 'an area of great archaeological potential', whilst the maritime Zones E, D and F

were all expected to contain archaeology but required detailed assessment. Zone G, adjacent to the modern shore-line, was not considered to be 'of a high archaeological priority'.

It was anticipated that the Dover Sewers/A20 project would help considerably in defining the nature and extent of the surviving stratification within zones that had seen little or no previous archaeological investigation.

3) Assessment of the Project

3.1 Factual Data

General information and quantity of records

3.1.1 The A20 road scheme ran from west to east through archaeological Zones E, D, C, F and G as defined by Wilkinson (1990). Of these, Zone C within the heart of the historic town (Fig. 2), was regarded as 'an area of great archaeological potential', whilst Zones E, D and F were all expected to contain some archaeology but required detailed assessment. Zone G adjacent to the modern shore-line was not considered to be 'of a high archaeological priority'.

3.1.2 Archaeological excavations and observations by members of Canterbury Archaeological Trust were made at twenty-one individual locations along the route of the A20 (Fig. 1). Each site was given a CAT identifying code letter (see Fig. 1; Tables 1 and 2). Sites investigated by the GSF team (see above) were generally coded independently, since they tended to become available at very short notice and did not always exactly correspond with the archaeological sites.

The archaeological work by CAT generated a total of some 2490 recorded contexts, illustrated by 228 drawn plans, 167 drawn sections and some 5000 photographs, supplemented by an extensive series of hand-written notes, sketches and descriptions. Of the individual sites investigated (summarised in Table 1), three were examined by means of formal excavation and thirteen by salvage recording as part of a watching brief. At a further five sites formally excavated trenches and small areas were undertaken as control samples, followed by a subsequent watching brief as the road construction work began.

3.1.3 The palaeo-environmental work undertaken produced a total of 89 stratigraphic profile observations, including 22 bore-holes (Fig. 3; Table 3). Some 1073 bulk samples, 45 drill cores and 46 sediment monoliths were recovered in all. The locations of the principal bore-holes are shown on Fig. 3. Details of the observed stratification were recorded with photographs, drawn sections and profiles and an extensive series of hand-written notes, sketches and descriptions (Barham *et al*. 1995). Of the bulk samples, a total of 232 of came from specific medieval deposits in the Bench Street area (DS/C, P & I).

3.1.4 Information concerning individual archaeological sites was generally recorded by means of drawn sections and plans and standard, pre-printed context record sheets. For the area around Bench Street, within the heart of the ancient town, all archaeological information was plotted onto previously prepared plans drawn at a scale of 1:50. These were supplemented by larger plans at 1:20 and drawn sections at 1:10 or 1:20. Elsewhere on the route sections of similar scales were drawn, in conjunction with plans at 1:500, 1:100, 1:50 or 1:20, depending on the detail required.

3.1.5 The archaeological finds recorded to date include 4897 pot-sherds, 539 clay tobacco pipe fragments (including kiln wasters), 1774 pieces of building material and 1388 registered finds. There are also significant amounts of animal bone, fish bone and marine shell. It should be

anticipated, however, that the processing of additional bulk samples (identified below) will produce further groups of material for analysis, most particularly significant quantities of fish bone, also animal bone and pottery.

The pottery assemblage recovered so far is very heterogeneous with all the post-Roman pottery falling between a *c.* A.D. 850 - 1950 timespan. There is no early or mid Saxon pottery present, the earliest pottery being a few sherds of late Saxon Thetford-type ware (*c.*A.D. 850 - 1100 A.D.) and some less diagnostic imports and local wares. Nearly all of this small late Saxon collection occurs as fairly worn sherds and none of the A20 pottery is likely to have been deposited much before *c.*A.D. 950 or 1000. Overall, the pottery assemblage has two chronological strong-points, the early medieval (here *c.*A.D.1075 - 1250), the twelfth century being particularly well represented (especially on the 'Crypt' site DS/C), and the post-medieval period (*c.*A.D. 1550-1850). The intervening medieval/late-medieval period is rather patchily represented.

Table 1: Summary of Investigated Sites along the A20 (to be used in conjunction with Fig. 1)

DS/L (South Lines, Aycliffe)

Lower slopes of the Western Heights overlooking the sea.
Extended watching brief; salvage recording; building recording and
Palaeo-environmental sampling ahead of, and during road-building:
19th century gun battery (South Lines Battery).
19th century fortress moat (South Lines).
20th century artillery/search light emplacements.
Palaeo-environmental evidence (late glacial soils).
Excavated Contexts: 0; Recorded Contexts: 1 (Total: 1)
FINDS: soil samples; small amount of pottery and other finds from the soil dumped over the magazines of the Battery.
No matrix drawn

DS/F (Archcliffe Fort; Scheduled Ancient Monument No.173)

17th-19th century artillery fort.
Extended watching brief; limited excavation; salvage recording;
building recording and palaeo-environmental sampling ahead of, and during,
road-building and sewer trenching:
17th-19th century fort entrance structure.
17th century fort wall.
Prehistoric occupation under north rampart.
Palaeo-environmental evidence
Excavated contexts: 60; Recorded contexts: 32 (Total: 92)
FINDS: pottery and glass from excavated soils dumped over 18th century bridge; struck flints; soil samples.
Matrix drawn

DS/H (Bulwark Hill)

Hill slope below Archcliffe Fort, above Paradise Basin.
Small scale excavation and salvage recording ahead of road building:
17th-19th century walls, including part of a possible outer gatehouse to Archcliffe Fort ?
Excavated contexts: 31; Recorded contexts: 0 (Total: 31)
FINDS: small assemblage of pottery etc.
Matrix drawn

DS/B (Bulwark Street area) Archaeological Zone E

Large area east of Archcliffe Fort representing the site of the filled in Paradise Basin of the old Pier District. Extended watching brief, salvage recording, very small scale excavation and palaeo-environmental sampling during extensive road building:
17th-19th century building remains (domestic).
Post-medieval harbour infilling.
Old cliff line.
Palaeo-environmental evidence
Excavated contexts: 0; Recorded contexts: 346 (Total: 346)
FINDS: post-medieval pottery and other finds including 2 coins; soil samples.
Matrix drawn

DS/K (Limekiln Street) Archaeological Zone E

North side of Limekiln Street at foot of cliffs. Limited watching brief during road building:
Post-medieval cliff retaining wall.
Small, man-made cave dug into the cliff face.
Palaeo-environmental evidence
Contexts: 0
FINDS: none.
No matrix drawn

DS/E (Elizabeth Street) Archaeological Zone E

East side of The Viaduct, adjacent to railway. Limited watching brief during road building and sewer trenching;
palaeo-environmental sampling.
Later post-medieval building remains.
Early 19th century brick culverts relating to old harbour works.
Palaeo-environmental evidence (natural beach deposits).
Excavated contexts: 0; Recorded contexts: 21 (Total: 21)
FINDS: small assemblage of pottery etc.; soil samples.
No matrix drawn.

DS/G ('The Graves')

Lower slopes of Western Heights, above Meggar Instruments works. Site of old burial ground; traditional site of 17th century plague pits. Measured survey of the area ahead of sewer trenching; machine cut test-trench:
19th century brick vaults, fences and paths.
Excavated contexts: 0; Recorded contexts: 11 (Total: 11)
FINDS: 18th-19th century grave-stone salvaged.
No matrix drawn.

DS/R (Railway Bridge) Archaeological Zone E

Bridge over railway at eastern end of Limekiln Street, adjacent to old Strond Street. Extended watching brief and palaeo-environmental sampling ahead of bridge building:
Foundations of 19th century Holy Trinity Church.
Possible e.19th century lime-kilns predating the church.
18th century clay pipe-manufacturing debris found in a pit.
Post-medieval cellar walls and a well.
Palaeo-environmental evidence (natural beach deposits and chalk rubble deposits from an ancient cliff collapse).
Excavated contexts: 0; recorded contexts: 30 (Total: 30)
FINDS: post-medieval pottery, glass and a large sample of clay-pipes.
No matrix drawn.

DS/A (Appledore Works) Archaeological Zone E

Old Appledore Engineering works (formerly The Packet Yard) on eastern side of the railway. Watching brief and building recording ahead of road works:
Large 18th-19th century chalk vaulted cellars with graffiti on the walls.
Contexts: 0
FINDS: None
No matrix drawn.

DS/S (Snargate Street, South of) Archaeological Zone D

Along quay-side, south of Snargate Street. Extended watching brief during sewer trenching: palaeo-environmental sampling
Numerous post-medieval walls (mostly 18th-19th century cellars).
Early road surfaces (under modern street).
Palaeo-environmental evidence (natural beach deposits).
Excavated contexts: 0: Recorded contexts: 145 (Total: 145)
FINDS: soil samples; post-medieval pottery etc.
No matrix drawn.

DS/N (Northampton Quay) Archaeological Zone E

East end of Snargate Street, south of York Street Roundabout (DS/Y).
Watching brief during sewer trenching:

Palaeo-environmental evidence (natural beach deposits).
Contexts: 0.
FINDS: none
No matrix drawn.

DS/Y (York Street Roundabout) Archaeological Zone C*

York Street Roundabout, at east end of Snargate Street. Extended watching brief with some very limited excavation; palaeo-environmental sampling:
Medieval town wall with sea breach.
Other medieval and post-medieval walls and deposits (limited).
Natural wind-blown sands.
Natural beach deposits.
Natural harbour silts.
Excavated contexts: 0; Recorded contexts: 23 (Total: 23)
FINDS: small assemblage of pottery, building materials and soil samples.
No matrix drawn.

DS/C (The Crypt Restaurant Site) Archaeological Zone C*

West side of Bench Street on site of former Shakespeare Hotel.
Formal archaeological excavation on line of sewer trench; palaeo-environmental sampling and building recording:
Excellent sequence of well-stratified deposits, pits and walls representing occupation from late Saxon to post-medieval times.
Surviving medieval undercroft along street frontage.
Low-level river/harbour sediments.
NB: This is the principal excavation of the project.
Recorded contexts: 0; Excavated contexts: 456 (Total: 456)
FINDS: pottery, bone, clay-pipes, building materials, soil samples.
Matrix drawn

DS/J (J.G.'s Amusements, adjacent to) Archaeological Zone C*

Junction of Bench St and Townwall St, west side.
Formal archaeological excavation followed by salvage recording during construction of pedestrian underpass; palaeo-environmental sampling:
North-west corner of Elizabethan gun battery.
Medieval town wall and Boldware Gate remains.
Post-medieval clay dump deposits.
Palaeo-environmental evidence (natural beach deposits).
Recorded contexts: 0; Excavated contexts: 118
FINDS: pottery, bone, building material etc., soil samples.
Matrix drawn.

DS/T (Townwall Street) Archaeological Zone C*

Townwall Street dual carriage-way. Extended watching brief and formal
excavation during road building and underpass construction; palaeo-environmental sampling:
Post-medieval Three Gun Battery and other deposits.
Medieval town wall with Boldware and Butchery gates.
Medieval river-side walls.
Natural beach deposits.
Roman harbour wall.
Bronze Age boat.
Prehistoric river silts.
Recorded contexts: 141; Excavated contexts: 109 (Total: 250)
FINDS: Medieval and post-medieval pottery etc.; water-logged Roman and prehistoric wood, soil samples.
Matrix drawn.

DS/P (Bench Street) Archaeological Zone C*

Carriage-way of Bench Street. Small scale formal excavation; extended watching brief; salvage recording and palaeo-environmental sampling ahead of, and during excavation of sewer trench and pedestrian underpass:
Extensive traces of medieval and post-medieval buildings.
Good sequences of medieval and post-medieval stratified deposits
(representing a continuation of those on DS/C).
River sediments with organics.
Wind-blown sands.
Recorded contexts: 268; Excavated contexts: 259 (Total: 527)
FINDS: Pottery, bone, building material, wood, soil samples.
Matrix drawn.

DS/Q (Queen Street) Archaeological Zone C*

South side of Queen Street. Watching brief and salvage recording during road re-aligning and service trenching:
Traces of Zion Chapel (post-medieval), with 19th century grave.
Traces of post-medieval buildings and deposits.
Traces of medieval stone buildings and soil deposits.
Palaeo-environmental sampling (2 bore-holes)
Recorded contexts: 100; Excavated contexts: 0 (Total: 100)
FINDS: small assemblage of pottery, etc.
NB: This area was more extensively dug by K.A.R.U. in 1980-81.
Matrix drawn.

DS/I (Fishmonger's Lane) Archaeological Zone C*

Carriage-way of Fishmonger's Lane. Extended watching brief and salvage recording during sewer trenching; palaeo-environmental sampling:

Medieval and post-medieval walls and deposits. River sediments with organics.
Recorded contexts: 88; Excavated contexts: 0 (Total: 88)
FINDS: small assemblage of pottery, bone, wood etc; soil samples
Matrix drawn.

DS/M (Mill Lane) Archaeological Zone C*

Carriage-way of Mill Lane and adjacent river bed. Extended watching brief and salvage recording during sewer trenching; survey of river- bed:
Medieval and post-medieval river-side masonry walls.
Medieval and post-medieval deposits.
Recorded contexts: 19; Excavated contexts: 11 (Total: 30)
FINDS: small assemblage of pottery etc.
No matrix drawn.

DS/U (New Bridge) Archaeological Zone E

South end of pedestrian under-pass opposite Bench Street. Extended watching brief and salvage recording during underpass construction:
New Bridge, 1800.
16th century Three Gun Battery.
Natural beach deposits.
FINDS: small assemblage of pottery etc.
No matrix drawn

DS/W (Woolcomber Street) Archaeological Zone F

Junction of Woolcomber Street with Townwall Street below Castle cliffs, in front of presumed line of medieval town wall. Extended watching brief and salvage recording during road re-aligning and service trenching; palaeo-environmental sampling:
Good sequence of medieval deposits with some walls exposed and recorded but not sampled in detail.
Recorded contexts: 88; Excavated contexts: 0 (Total: 88)
FINDS: small assemblage of pottery etc; soil samples.
Townwall Street site subsequently dug by C.A.T., 1996
Matrix drawn.

(* = core area of medieval town)

Table 2: Summary of Recorded Archaeological Information by A20 Site (Fig. 1)

DS/L (2) South Lines, Aycliffe
Contexts, 1
Plans, 6
Sections, 0
Notes, 1 folder
Films, 26

DS/F (1, 2) Archcliffe Fort
Contexts, 92
Plans 8
Sections, 10
Notes, 2 folders
Films, 19

DS/H (1) Bulwark Hill
Contexts, 31
Plans, 2
Sections, 2
Notes, 0.5 folder
Films, 9

DS/B (2) Bulwark Street area
Contexts, 346
Plans, 6
Sections, 17
Notes, 3 folders
Films, 15

DS/K (2) Limekiln Street
Contexts, 0
Plans, 1
Sections, 0
Notes, 0.5 folder
Films, 2

DS/E (2) Elizabeth Street
Contexts, 21
Plans, 2
Sections, 2
Notes, 0.5 folder
Films, 7

DS/G (1, 2) 'The Graves'
Contexts, 11

Plans, 1
Sections, 3
Notes, 0.5 folder
Films, 6

DS/R (2) Railway Bridge (Limekiln St)
Contexts, 30
Plans, 1
Sections, 2
Notes, 0.5folder
Films, 5

DS/A (2) Appledore Works
Contexts, 0
Plans, 1
Sections, 1
Notes, 0.5 folder
Films, 6

DS/S (2) Snargate Street (S. of)
Contexts, 140
Plans, 3
Sections, 6
Notes, 1 folder
Films, 15

DS/N (2) Northampton Quay
Contexts, 0
Plans, 1
Sections, 1
Notes, 0.5 folder
Films, 1

DS/Y (2) York Street Roundabout
Contexts, 23
Plans, 2
Sections, 4
Notes, 0.5 folder
Films, 25

DS/C (1) Crypt Restaurant (Bench St)
Contexts, 456
Plans, 87
Sections, 14
Notes, 3 folders
Films, 34

DS/J (1) Junction of Bench St and Townwall St
Contexts, 118
Plans, 57
Sections, 8
Notes, 2 folders
Films, 17

DS/T (1, 2) Townwall Street (excluding Bronze Age Boat)
Contexts, 250
Plans, 21
Sections, 46
Notes, 3 folders
Films, 30

DS/P (1, 2) Bench Street
Contexts, 527
Plans, 11
Sections, 25
Notes, 3 folders
Films, 36

DS/Q (2) Queen Street
Contexts, 100
Plans, 5
Sections, 4
Notes, 1 folder
Films, 5

DS/I (1) Fishmonger's Lane
Contexts, 88
Plans, 1
Sections, 8
Notes, 1 folder
Films, 5

DS/M (1, 2) Mill Lane
Contexts, 30
Plans, 3
Sections, 2
Notes, 0.5 folder
Films, 5

DS/U (2) Townwall Street underpass (south)
Contexts, 50

Plans, 2
Sections, 2
Notes, 1 folder
Films, 5

DS/W (2) Woolcomber Street
Contexts, 88
Plans, 2
Sections, 7
Notes, 1 folder
Films, 3

Totals
Contexts, 2490
Plans, 228
Sections, 167
Notes, 26 folders
Films, 150

NB: (1) *Formal archaeological survey/excavation*
(2) *Watching brief/salvage recording*

3.2 Summary of the sedimentary sequence

The sedimentological data obtained in the field by GSF must form the basis for any study concerning the evolution of the Dour estuary and the nature of the early harbour basin. A summary of the sedimentary sequence along the route was provided by Bates and Barham in the original 1995 assessment. However, since then there has been more work in Dover e.g. on sediments from the site of the Bronze Age boat (Keeley forthcoming), the Western Docks (Palmer, Toms, Green and Branch 1998) and at Townwall Street (see above). An updated sedimentary sequence is included in the detailed revised assessment report (Bates 1999a; 1999b) and is summarised below.

Five main groups of sedimentary units were recorded along the road corridor. These are:
1. Angular flint gravels
2. Tufa and peat units
3. Fine grained (inorganic) silts
4. Organic sands and silts
5. Sands and rounded flint gravels

The angular flint gravels (1) have no certain associated archaeology and are thought to have been laid down by fluvial processes under periglacial conditions. The fluvial systems may have been dominated by braided channels. A mammoth tooth previously found in a section exposed in these deposits in the Market Square suggests an age in excess of 8000 BC for the deposition of these gravels.

The tufa/peat units (2) are associated with prehistoric artefacts (predominantly ascribed to the mid-later Bronze Age), such as the Dover Bronze Age boat (Clark forthcoming). However, C14 age estimates indicate a range of ages for the peat deposits spanning much of the early Holocene. Deposition is thought to have been in a braided fluvial system, in carbonate rich floodplain or channel margin environments which do not exist in the Dour Valley today.

The fine grained silts (3) are associated with re-deposited Bronze Age to Romano-British pottery and were laid down in a variety of environments, including as colluvium (hillwash) or alluvium (overbank flooding).

The organic silts-sands (4) are associated with artefacts of Roman date and appear to have been deposited in sub-tidal or inter-tidal situations in a brackish or saline environment. C14 age estimates vary from AD 260 ± 70 and AD 455 ± 65.

The sands and rounded flint gravels (5) abut the south wall the late-Roman Saxon Shore fort and are interpreted as forming within a beach or back-beach environment; sands at higher elevations may be wind-blown. Stratified late Saxon deposits have been recorded in the upper levels of the sands during excavations in the Bench Street area (DS/C, P).

The sedimentary units above the angular flint gravels form a wedge-shaped envelope where sediment depths are greatest beneath the modern town centre and thin up-valley towards

Crabble Paper Mill. Contact surfaces between the late-Pleistocene gravels and the overlying Holocene sediments increase in elevation from *c.* -1.0 m O.D. in the Bench Street Underpass to *c.* +12.0 m O.D. at Crabble Paper Mill. Within much of the built-up area of Dover, the Norman and post-Norman sediments/cultural horizons/made ground cap the deposits described above, e.g. at Fishmonger's Lane.

3.3 Summary of results of the sedimentary sequence assessment

A number of key points have emerged from the assessment. All the 22 bore-holes available for study are listed in Table 3 (see Figs. 3 and 4).

Bore-hole Number	**Location**	**Processed Bulk Samples**	**Unprocessed Bulk Samples**	**Total Number Bulk Samples**	**Number U4/U100 Samples**
DBS-1	Bench St.				2
DBS-2	Bench St.	16		16	3
DBS-3	Bench St.	19		19	4
DBS-4	Bench St.				6
QS-1	Queen St.	21	8	29	6
QS-2	Queen St.	12	7	19	3
DSE-1	Dover Stage Hotel	10	14	24	
DSE-2	Dover Stage Hotel		10	10	
DSC-1	Crypt Site		44	44	
DSC-2	Crypt Site	22	17	39	7
DSC-3	Crypt Site		20	20	
DSC-4	Crypt Site		25	25	
DSC-5	Crypt Site	6	8	14	4
TWS-1	Townwall St.	7		7	
TWS-3	Townwall St.		18	18	2
TWS-4	Townwall St.		12	12	1
TWS-5	Townwall St.	17		17	2
TWS-6	Townwall St.	1	8	9	1
TWS-8	Townwall St. (east)	7	9	16	
TWS-9	Townwall St. (east)				
DSI-1	Fishmongers Lane		14	14	4
DSI-2	Fishmongers Lane		13	13	
Total		**138**	**227**	**365**	**45**

Table 3: Bore-holes drilled during the A20 Road scheme listing sample statistics for material recovered from individual bore-holes in Town Centre (Zone III) - see Fig. 3

Good sequences through the basal flint gravels are not available within the Dover A20 data set. Tufa and organic rich sediments, probably dating to the prehistoric period, cluster around the lower Bench Street/Townwall area and are present in bore-holes DSE2, DSC1/2/5 and TWS 3/4/5/6 (Figs. 3 and 4). Additionally, thick sequences of tufa are present in bore-holes QS1 and QS2. Inorganic sediments sealing the tufa/peat sequences are only well sampled and recorded in the Dover Boat trenches. Organic sediments thought to infill the Roman harbour are present in bore-holes DBS-1 to DBS-4 and DSC-1 to DSC-5. Sand and gravel sequences are well sampled and recorded from within Bench Street, Townwall Street and at the Crypt site (e.g. DBS-1-4, QS1/2, DSC 1-5, TWS 1/3/4/5/6/8/9). Organic sediments above the sands and gravels are only well preserved in the Fishmonger's Lane area (DSI 1/2).

3.4 Summary of the archaeological discoveries

3.4.1 *Prehistoric Occupation*

The A20 project produced an interesting range of evidence for prehistoric occupation in the Dour valley and the adjacent downland. Of prime importance were the remains of a well-preserved Bronze Age wooden sewn-plank boat discovered in association with other cultural material below the medieval town wall at the end of Bench Street (**DS/T**) in the heart of the historic town. This internationally important find is the subject of separate reports and it will not be further considered here.

Bore-hole sampling in the same area, however, also produced valuable evidence for the complex sequence of sedimentation within the Dour valley (see above), before, during and after the deposition of the Bronze Age boat and this information is of considerable significance in reconstructing the nature of the early river mouth and its potential as a haven for ancient shipping.

Beyond the estuary, other rather less spectacular remains of prehistoric date were discovered. These finds clearly add to our understanding of prehistoric settlement in the Dover area, questions concerning the nature of which having now been brought so sharply to the fore by the discovery of the Bronze Age boat.

The earliest prehistoric artefact recovered came, curiously enough, from a bore-hole drilled by GSF on the Dover Stage car-park site. Here, within a deeply buried deposit of angular flint river gravel (unit 1, see above), a flint adze, crudely chipped from a water-rounded flint nodule was brought to the surface in a core sample. Typologically, the implement appears to be of Mesolithic date and hints at settlement within the valley at this early stage.

Further evidence of prehistoric settlement comes from the line of the new road west of the town - within the seventeenth century walls of Archcliffe Fort (**DS/F**) a small assemblage of prehistoric struck flints and calcined flints was recovered from an undisturbed deposit over the natural brickearth, exposed in a new sewer trench. This lithic material is clearly indicative of prehistoric settlement on the Archcliffe promontory, probably during the late Neolithic or Bronze Age period.

3.4.2 *The Roman Harbour*

Despite Dover's importance during the Roman period, little direct evidence for Roman activity was revealed during the A20 project, confirming that the main settlement area lay further to the north. One highly significant discovery, however, was made during September 1992. The excavation of a deep pit by contractor's at the southern end of Bench Street (**DS/T**), led to the exposure of part of a massive timber structure, identified as a Roman harbour mole, very similar to one discovered further inland in 1855-6.

Only a 3.40 m. length of the present structure was revealed but from this it would seem that the timbers formed part of a timber box framed harbour wall of typical Roman construction. Most probably this lay at an approximate right angle to the land and possibly ran out from the western bank of the estuary. Two horizontal side timbers (one re-used) aligned roughly east-west formed the southern wall of the structure and horizontal cross-beams braced it laterally. The timbers had been preserved within a construction trench some 0.77 m. deep cut into what must have been the shallow bottom of the estuary. The upper tiers of the mole had been subsequently removed, probably by marine erosion. The surviving top of the timbers lay at +0.559 m. O.D.

It will be possible to consider the significance of this important new discovery in conjunction with the sedimentological evidence recorded from the same area by the GSF team. The data concerning the levels will hopefully contribute to any consideration of the height of Roman sea-level.

3.4.3 *The Anglo-Saxon Settlement and Harbour*

During the A20 project, evidence for late Anglo-Saxon activity/occupation was recorded on two adjoining sites within the town (**DS/C** and **P**). These sites lay underneath (**DS/P**) and on the western side (**DS/C**) of modern Bench Street (south end). Despite earlier theories, prolonged investigation revealed no evidence whatever for any Anglo-Saxon occupation in the area of Snargate Street or the Pier District and it now seems clear that both these areas were not colonised until the later medieval period at the earliest. Collectively the A20 data provides some very useful, if mostly negative, information regarding the topography of Dover in Anglo-Saxon times.

Evidence for Anglo-Saxon occupation in the Bench Street area was confined to a series of thin, ashy occupation layers resting upon the surface of a thick deposit of sand filling the old harbour estuary and heavily disturbed by later, medieval pits. The occupation layers were frequently separated by thin layers of sand, perhaps implying intermittent occupation of the area. Only two or three features were associated with the occupation layers in the form of odd pits and post-holes, all found below modern Bench Street. The Saxon occupation deposits were associated with a small amount of pottery broadly dated *c.* A.D. 875 - 1100 and contained significant amounts of fish remains and animal bones. However, the general absence of rubbish pits and structural features indicates that this region did not lie in the centre of the Anglo-Saxon town. The area actually appears to have been occupied in only a superficial way, perhaps seasonally.

Although seemingly not situated within the main Anglo-Saxon settlement, the southern end of Bench Street also clearly did not lie in the sea. Casually occupied during the later Anglo-Saxon period, this region apparently lay on a coastal sand ridge somewhere between the town and the shore line. Whatever the exact nature and location of the Saxon haven at Dover it was not located here. Environmental evidence from the northern end of Bench Street, however, does indicate the presence of water there, extending eastwards along the line of present day Fishmonger's Lane. Pottery recovered from the associated freshwater/tidal sediment has proved to be of post-Conquest date but it seems fairly certain that this wet area is a remnant of a much more extensive Roman harbour basin, which it would now seem had been blocked by the sands further to the south.

3.4.4 *The Norman Settlement and Harbour*

Extensive work in the area of Fishmonger's Lane (**DS/I**) and Bench Street (**DS/P** and **DS/C**) associated with the construction of a new pedestrian underpass and a major branch sewer provided some valuable information regarding the topography of this part of Dover in Norman times.

Towards the southern end of Bench Street evidence for Norman occupation was represented by numerous rubbish pits cut into the natural sands on the **DS/C** and **DS/P** sites. No certain structural remains were revealed and there was no evidence for the documented fire of 1066. The pits produced pottery datable to the period *c.* A.D. 1075 to 1175 and contained large quantities of well-preserved fish remains. The general absence of structural remains, however, indicates that this region, as in the late Saxon period, was not a settlement area but merely waste land convenient for burying rubbish. The occurrence of rubbish pits under the line of Bench Street itself, together with the general absence of early road metalling here indicates that this street had not yet come into existence. To some extent this is explained by discoveries at the northern end of Bench Street where evidence for the former existence of estuarine deposits was recorded, thus separating south Bench Street from the Market Square area, where the principal Norman occupation areas seem to have lain around the church of St Martin le Grand (erected *c.* A.D. 1070-1110, adjacent to the site of an earlier Anglo-Saxon timber church).

The wet area must have stood just outside the as yet unlocated south-east corner of the late Roman Shore fort and probably represents the last remnants of the fort's associated harbour basin. The organic sediments, of freshwater or tidal origin, filling this area contained pottery dateable to the period *c.* A.D. 1050 - 1175 and yielded considerable quantities of domestic rubbish, particularly fish remains, making it clear that the region was being used for rubbish dumping at the same time as the pits to the south were in use. These water-laid organic silts with their overlying consolidation deposits were traced eastwards down Fishmonger's Lane towards the present river. The dumping of rubbish within the wet area implies that there was occupation immediately adjacent and that attempts were being made to reclaim ground here. This in turn suggests that the area no longer had any usefulness as a harbour basin and may indicate an easterly shift in the site of any harbour basin. The subsequent deposits in this area show clearer evidence for consolidation in the form of extensive layers of laid chalk rubble. Thin occupation layers between these chalk deposits yielded pottery ranging in date from *c.* A.D. 1150 to 1250 and may provide evidence to indicate expansion of the town during this period..

3.4.5 *The Medieval Town Wall and Gates* (Fig. 5)

Significant traces of the Dover's medieval town wall were exposed in the A20 contractor's excavations between the River Dour and York Street round-about (**DS/T** and **Y**). Traces of the Boldware Gate and Butchery Gate (Fig. 6) were discovered (see below). In places, the 2 to 3 metre thick curtain wall survived just below pavement level and still stood to a height of almost 5 metres (Fig. 7). The southern (seaward) face of the wall was constructed from large, neatly shaped greensand blocks. The lower facing stones were water worn, demonstrating that the sea had once washed the foot of the curtain. It seems probable that the wall was constructed on the original medieval fore-shore, below the high water mark. Details of the wall's foundation were recorded east of the Boldware Gate. Here, the southern side of the wall stood upon a line of timber beams supported by closely-spaced elm piles driven into the beach.

Evidence for at least three subsequent breaches of the curtain wall by the sea were recorded. At the Boldware Gate the entrance passage had been greatly enlarged by wave attack. Immediately to the east was a second breach in the curtain wall and another was recorded some 50 metres west of the Boldware Gate. Despite the later damage, it remains clear that the construction of Dover's medieval defences was a major undertaking, with very large quantities of stone being imported from neighbouring Folkestone.

The remains of the Boldware Gate were discovered at the southern end of Bench Street. No illustrations of this structure have survived and its precise form was unknown before work began. The surviving remains were fairly meagre and it was abundantly clear that the major part of the structure had been destroyed by the sea. The ruined site had subsequently been buried under the Three Gun Battery (see below).

The gateway seems to have originally consisted of a square or rectangular tower, projecting northwards (i.e. inland) from the main curtain and pierced by a single entrance passage. Part of the western side of the gate-tower remained, although the masonry had collapsed and when discovered it was leaning at an angle of about 30 degrees from the vertical. On the eastern side of the fallen fragment, cut into a column of large, squared ragstone blocks was a well defined vertical slot, clearly for a portcullis.

With the removal of the 1960s concrete road bridge in 1992, preparatory to the laying of a new branch sewer across the River Dour and the complete reconstruction of the bridge, traces of the former Butcher Gate gate-tower (Fig. 6) and the adjacent curtain wall were somewhat unexpectedly revealed. In the river bed, under a thin layer of modern river gravel, the eastern edge of the original medieval 'Hole' through the town wall was recorded adjacent to part of a massive base of mortared rubble which must represent the foundations of the gate-tower.

The wall remains recorded during the A20 project can be compared with the contemporary documentary evidence recently studied by Sweetinburgh. These records both confirm and add considerably to our understanding of the archaeological evidence.

3.4.6 *Structures within the Medieval Walled Town* (Fig. 5)

Within the walled town extensive contractor's excavations, in conjunction with formal archaeological investigations and watching briefs, allowed the detailed recording of numerous

medieval deposits and structures in and adjacent to Bench Street (**DS/C** and **P**), Queen Street (**DS/Q**), Fishmonger's Lane (**DS/I**) and Mill Lane (**DS/M**).

Situated within Archaeological Zone C (of great potential), these adjoining streets on the west side of the river Dour, are all ancient thoroughfares. Study of the recorded sequence here should enable a picture of the settlement evolution of this part of Dover to be built up, from Roman and early Saxon times, when most of the region was under water, through to the later medieval colonisation of the area (see above) and post-medieval developments.

Some further discoveries were made on the eastern side of the town in the area of Woolcomber Street (**DS/W**). This region (Zone F) appears to form an eastern suburb of the main medieval town and the nature of the settlement here has been in need of detailed assessment for many years. However, the discoveries made during the A20 project were instrumental in bringing about a major excavation here in 1996, when the Townwall Street filling station was rebuilt. These important excavations have gone some considerable way towards resolving the lack of research in this part of Dover.

A summary of the recorded evidence from the individual sites/areas investigated within the medieval walled town is set out below:

3.4.6.1 The Crypt Restaurant Site, west side of Bench Street (**DS/C**)
It was possible to undertake a detailed excavation upon the site of the old Crypt Restaurant on the western side of Bench Street, ahead of the digging of the new sewer pipe trench. This constituted the most extensive piece of controlled archaeological work carried out and a very useful sequence of medieval and post-medieval deposits and ceramic finds was recovered, providing a firm foundation upon which to base much other work undertaken in the area.

The archaeological deposits may be sub-divided into the following broad phases:

Period 0: Natural sands in-filling Roman harbour basin
Period 1: Late Anglo-Saxon occupation
Period 2: Norman cess-pits
Period 3: Twelfth-thirteenth century chalk floored timber buildings
Period 4: Late medieval stone buildings
Period 5: Post-medieval structures

The excavations consisted of a single curved trench following the proposed line of the sewer, running from the old Snargate Street frontage across the site of the demolished Crypt Restaurant building (destroyed by fire in 1977 and formerly the Shakespeare Hotel) and into Bench Street. The trench was some 2.50 m. in width and 40.00 m. in length. At the south-west end a series of rubble-filled nineteenth century cellars, post-medieval pits and tanks were located, relating to buildings which once fronted onto old Snargate Street (north side), and which had been demolished in 1970-71 to make way for road improvements.

As the trench was excavated north-eastwards two post-medieval boundary walls were located marking the northern limit of the Snargate Street properties. On the northern side of these an

impressive series of primary medieval deposits over one metre thick had survived without much later disturbance in an area formerly occupied by the yard of the Shakespeare Hotel. To the east lay the open basement of the Crypt Restaurant, which although actually taking its name from a medieval structure on the other side of Bench Street, does include the remains of a medieval undercroft within its own fabric. The undercroft perhaps formed part of a rich merchant's residence and a detailed study of the heavily restored fabric succeeded in identifying the presence of at least two separate periods of medieval work here.

The main excavation was continued up to the western wall of the open Crypt basement and from this it was clear that the medieval cellars here were once rather more extensive, with several phases of filled-in vaulted chamber being located in the trench. The structural sequence was complex with two previously detached ?garderobe shafts subsequently being cleaned out, floored and connected to the main cellar complex by a linking passage creating a long, tunnel-like, extension to the original cellars. Later, this extension was filled in and the cellars reverted to more or less their original size.

The dating evidence suggests that the cellars are of thirteenth - fourteenth century date and it is clear that these deeply excavated features destroyed a well-stratified sequence of earlier medieval deposits in this area. Where there were no later cellars this fine sequence was examined in more detail. Towards the base of the sequence a series of Norman cess pits cutting through thin late Saxon occupation levels into the underlying natural sands was revealed (see above). These were sealed by a series of chalk consolidation layers interleaved with occupation deposits rich in finds. In the light of the subsequent work at the Townwall Street filling station site, it seems fairly certain that these remains represent the floors of simple wooden houses, the full extent of which were not revealed within the limited confines of the excavated trench. These floor layers were remarkably consistent across the trench but in places had slumped into the underlying cess-pits. A good sequence of palaeo-environmental evidence was recovered from both the pits and the overlying deposits.

Excavation through the basement of the Crypt Restaurant revealed that restoration work in the 1920s had led to the lowering of the existing floor level, removing all significant medieval and post-medieval deposits. A useful sequence of estuarine deposits filling the old Roman harbour were, however, exposed below the modern floor levels and these were extensively sampled for environmental evidence.

3.4.6.2 Bench Street (**DS/P**)

Further medieval structures and deposits were revealed under Bench Street itself, during the contractor's excavations. Almost directly opposite the Crypt Restaurant site was another well-built undercroft relating to a dwelling on the eastern side of the original medieval thoroughfare. The super-structure of the building had been removed and the cellar in-filled during the widening of Bench Street in 1836/37. From various internal architectural features it was clear that the undercroft had belonged to a building of some quality, probably of thirteenth or fourteenth century date. The excavated remains can be readily equated with contemporary records and drawings of a 'Crypt' exposed during the nineteenth century road works (Fig. 8). A sequence of undisturbed stratified medieval and post-medieval soil deposits to the south (i.e. seaward) of this undercroft indicated that there were no more cellared buildings beyond here.

To the north, a small area of stratified medieval soil separated this building from the next - the remains of a massive stone-built tower (see below).

The Bench Street tower survived until 1836 (Fig. 9) and has been the source of much speculation by local historians. Still standing some 12 metres high in the nineteenth century, the structure proved to be fairly difficult to demolish but was eventually removed using gunpowder. Hasted (1800) believed, wrongly, that this tower formed part of the old church of St. Nicholas, yet on the evidence of the nineteenth century drawings and descriptions, the structure was clearly defensive, with a machicolated parapet and an entrance guarded by portcullis on the western side. Since its demolition there has been a considerable amount of confusion about this structure, not least of which has concerned its precise location.

Archaeological excavations during the winter of 1991/92, conducted whilst Bench Street was still in regular use, succeeded in locating the western side of a structure with mortared chalk foundations some 1.86 m. in width and 1.65 m. deep. From their substantial size and general location it seems certain that these foundations represent the base of the tower. Subsequent work revealed the base of the foundations cutting through a well defined series of earlier medieval deposits mostly of twelfth century date. These included a complex succession of rammed chalk floors, seemingly relating to an earlier series of timber buildings, similar to those recorded on the Crypt Restaurant site opposite and at the Townwall Street filling station site in 1996 (Fig. 10). The precise purpose of the tower remains unclear but a detailed study of the excavation records, the information recorded by nineteenth century historians and the architectural details shown on contemporary drawings should help define things more clearly.

Traces of further medieval walls, mainly fragments of undercrofts were recorded to the north of the tower and the general line of the eastern medieval street frontage of Bench Street was clearly defined. Under the line of the ancient road significant areas of stratified deposits including some road metalling was recorded.

3.4.6.3 Queen Street (**DS/Q**)
Re-building of Queen Street on a new alignment was undertaken as part of the present A20 project. Scope for archaeological work was limited but fragmentary traces of medieval and post-medieval floors, walls and other deposits and were recorded, adding to our knowledge of the extent of medieval occupation in this part of Dover.

3.4.6.4 Fishmonger's Lane (**DS/I**)
Above post-Conquest water laid sediments (see above), a series of consolidation layers, in the form of extensive layers of laid chalk rubble, provided clear evidence for the reclamation of this area in the later medieval period. Quite possibly, this reclamation work reflects an expansion in the size of the town during this period.

3.4.6.5 Mill Lane and the Bed of the River Dour (**DS/M**)
Following the removal of a small weir by the contractors and the consequent natural regrading of the bed of the River Dour, observations at the east end of Fishmonger's Lane, adjacent to Mill Lane, led to the recognition, planning and recording of substantial lengths of late medieval and

early post-medieval river-side walling. The latest of these walls related to the nineteenth century Town Mill that formerly occupied this site (The weir was related to it).

Probable medieval work was also noted within the fabric of the Flying Horse Lane bridge, a little to the north. Further river-side walls were revealed in the sewer trench cut along the full width of Mill Lane. Collectively, these observations show that by the later medieval period much of the old river estuary had been reclaimed and that the River Dour had been confined to roughly its present width and course, effectively placed within a walled channel that was in the nineteenth century, if not before, was largely built across. Documents record that somewhere in this area, the head prior of Dover Priory had paid 26s 8d, in 1520, for 60 ft (18.30 m.) of Folkestone stone, previously lent by the town, to build a water mill in Fyshe Market (Haines 1930, 303).

3.4.6.6 Woolcomber Street (**DS/W**)
Traces of significant stratified medieval occupation deposits, together with some masonry of a similar date, were recorded in the area of the Woolcomber Street/Townwall Street junction. Clearly focused on the Norman parish church of St James, the medieval settlement in this region appears to have been somewhat isolated from the main town. The nature of the settlement on this eastern side of the town has more recently been defined in the excavations conducted on the Townwall Street filling station site, largely brought about by the construction of the A20 (see above).

3.4.7 *The Medieval Street System*
The A20 project provided a good opportunity to conduct a study of the origins of part of Dover's street system, as excavations were carried out along the actual line of several modern streets, allowing the build-up of deposits below the modern tarmac to be recorded.

The principal routes examined within the historic town have been Bench Street, Queen Street, Fishmonger's Lane, Mill Lane, parts of Townwall Street and areas of Snargate Street. A series of early maps of the town, beginning in the sixteenth century, also provide important evidence for the extent of the early street pattern. From these maps it would seem that the bulk of Dover's streets were in existence by 1595. The development of the street system is clearly central to any study of the evolution of the town, and the evidence recorded during the course of the A20 field-work has provided some useful information concerning the origin of several streets.

From the recorded field evidence the roads which lie in our main study zone were fairly certainly built across areas that were under water in Roman times, indicating that they must originate in the Saxon or earlier medieval period. Significant areas of pits and stratified soils were recorded below modern Bench Street and Fishmonger's Lane showing that these roads were not laid out until post-Norman times, whilst Townwall Street does not seen to have been in existence before the curtain wall itself was built, probably in the fourteenth century.

At the northern end of Bench Street an apparent east-west causeway was recorded; built of chalk rubble with pebble metalling and heightened several times, it quite possibly represents a continuation of Queen Street, running eastwards roughly on the line of Fishmonger's Lane, into a wet area forming part of the old estuary. Indeed, from historic maps it is apparent that Queen

Street, Fishmonger's Lane and St James's Street effectively joined to form the only routeway to cross the full width of the Dour valley in the area of the ancient town. St James's Street also appears to have formed the principal link with the settlement on the eastern side of the valley adjacent to St James Church, and the castle.

3.4.8 *The Later Medieval Harbour*

The nature and location of Dover's medieval harbour works continues to be uncertain and this will remain a major study theme for research. Nevertheless, the A20 field-work produced some helpful, though mostly negative, information. The position of the Roman harbour area now seems fairly certain but presently there is no precise information concerning the location, nature and extent of the subsequent medieval harbour works until the end of the fifteenth century, by which time they had been moved to Archcliffe, a considerable distance to the west of the Roman site.

With the construction of the stone curtain wall along the seaward side of the town and the culverting of the little River Dour, probably during the fourteenth century, any harbour at Dover must then have been outside the walled town. From the excavated evidence it seems highly likely that the Boldware Gate represents a water gate that gave access from the town to the beach/harbour area. This could imply that the water-front lay immediately outside the gate and in this context a series of substantial vertical timber piles found nearby, just in front of the main curtain, may be significant. These were stout enough to have supported a quay fronting the town wall adjacent to the Gate but they were not regularly laid out. Alternatively, and perhaps more probably, they could represent some sort of sea defence to protect the toe of the wall from marine erosion. A series of dendro-dates currently being undertaken should provide a firm chronological foundation upon which to base further discussion of their function. Documentary records frequently mention a strong wyke or pier, commenced in 1422, running along the shore in front of the town wall between Snar Gate and Butchery Gate (Statham 1899 86; Sweetinburgh MS). These timbers could well represent part of this structure.

3.4.9 *The Pier District and the Post-medieval Town*

The work connected with the A20 represented the first archaeological investigation to be undertaken in the area of the important Pier District. The investigations were concerned principally with the deposits infilling the original Paradise basin (Fig. 13) and the subsequent buildings that were constructed across it. Abundant traces of the later post-medieval dwellings which were once packed into the area were exposed. The majority appeared to be of late eighteenth and nineteenth century date; some could be seventeenth century. Despite the observation of numerous excavations in the general area, no trace of Clark's Pier or its associated gun towers was located, nor has any indication of Anglo-Saxon occupation (suggested by the Wyke place-name) been forth-coming.

The Pier District was linked with the old town by Snargate Street and Limekiln Street running across the former beach below the high chalk cliffs. Deep excavations for the new sewer have allowed some recording of the early beach deposits in several places, together with a significant sample of the later post-medieval buildings constructed here. The bulk of these structures appear to be of late eighteenth-nineteenth century date although a few are probably seventeenth century.

3.4.10 *Artillery Defences*

The great strategic importance of Dover has led to the construction of numerous artillery defence works throughout the late medieval and post-medieval periods. The remains of several of these were encountered during the building of the A20. No evidence for the two gun towers (Fig.11) on Clark's Pier were located in the Pier District. A summary of the recorded evidence from the individual sites which were investigated is set out below:

3.4.10.1 The Three Gun Battery (**DS/J, T** and **U**; Fig. 14)

According to early maps and documents, during the late sixteenth century a gun battery (Three Gun Battery) was erected at the southern end of Bench Street in 1591 to defend the river but no trace of it was visible in 1991. In the early seventeenth century a new Customs House had been erected towards the rear of this battery (Fig. 14). Details of the available documents relating to these structures have now been provided by Dr Dixon. Although the Customs House was demolished in the eighteenth century, the battery itself remained until 1800 when it was used as an abutment for the New Bridge (also recorded ahead of destruction during the A20 project).

The battery structure, although quite well known from the early maps and documents noted above, had remained buried below the ground since it was incorporated into the New Bridge in 1800 and its exact location, size and construction were largely unknown until the present work began. Over a period of 18 months Trust members were able to record various sections of the battery, which was surprisingly well preserved in many places. Eventually it was possible to produce a complete ground plan of the work, allowing its precise position in relation to the modern town and its dimensions to be recorded for the first time. No traces of the later Customs House had survived.

Overlooking the mouth of the River Dour the battery seems to have been primarily designed to protect the harbour facilities here. Something that was never clear from early historians accounts was the battery's precise relationship to the medieval town wall and Boldware Gate which led through it. Excavation, however, has clarified the situation, showing that the old Boldware Gate and the adjacent curtain wall had been largely destroyed by the sea before the battery was constructed.

The battery structure consisted of a rectangular platform effectively projecting from the northern bank of the river. Measuring some 13 metres (E-W) by 21 metres (N-S), its strong outer walls were faced with large, neatly cut blocks of mortared ragstone over one metre thick; the south (seaward) wall survived to a height of more than 4 metres. The middle of the structure was filled with alternate layers of beach shingle and rammed chalk although no traces of the original battery floor had survived and must have stood at a higher level than surviving.

3.4.10.2 Archcliffe Fort (**DS/F**)

This important fort, situated on the western outskirts of the town, above the Pier District, is a Scheduled Ancient Monument, the surviving defences dating from the seventeenth to nineteenth centuries. The construction of the new A20 required the partial demolition of a nineteenth century brick 'barbican'-type structure protecting the main entrance to the fort,

together with the relining of the north-west moat. Preliminary surveys of the threatened entrance structure were undertaken by English Heritage ahead of the road building phase (Brian Kerr pers comm.). A considerable amount of further interesting information was recorded by C.A.T. during the course of the road works. Detailed archaeological examination demonstrated the existence of an entrance structure rather more complicated in development than an initial study indicated. Four phases of development were identified:

Periods I & II dated to the seventeenth century & eighteenth century respectively, related to a simple double-span bridge, first built of stone (and perhaps timber = Period I), then partially rebuilt in brick (Period II). Period III represents a major nineteenth century expansion of the bridge structure into a projecting barbican entrance fronting the main gate into the fort. This new building incorporated a series of rooms, at two levels, together with an enclosure wall equipped with musket loops. Documentary evidence suggests that these Period III additions date to 1809. A plan of 1884 indicates that the Period III rooms included messenger's quarters and a guard-room.

The Period IV remains, consist of subsequent additions to the Period III structure, principally in the form of a square room built towards the northern end of the barbican. The Period IV remains are dateable to the twentieth century and most probably relate to the occupation of the site during World War 2.

Road works adjacent to the North-East Bastion of the fort demonstrated that the bastion was partly built on a series of sand deposits apparently blown by the wind from the in-filling of the adjacent harbour basin.

Outside the main fort to the north, a length of mortared greensand and flint wall with flint galletting, fronting Bulwark Hill, was recorded. This so closely resembled the seventeenth century walls of the Fort opposite, that it may well indicate a related military structure. Indeed, the north wall of the fort is on a broadly similar axis to that of part of the wall and, added to their general proximity, possibly suggest a connection. The wall may have related to some sort of detached out-work of the fort, perhaps an outer gateway. More critical consideration to this notion will be required in due course.

3.4.10.3 The South Lines Battery (**DS/L**)

This extant structure lay above Archcliffe Fort and was a significant element of the nineteenth century fortifications upon the Western Heights overlooking Dover. Examination of the battery during the course of its destruction provided some interesting details about the structural history of the site. Of particular interest was the survival of several metal lighting 'ducts' fixed to the internal walls of the associated magazines. The most significant discovery made, however, was that of four previously unknown gun positions at the western end of the battery complex. Below these emplacements an earlier gun position was revealed, represented by a curved iron rail set into granite blocks.

There were four magazine buildings set between the main gun positions. During demolition it was possible to enter and make plans of these. Examination suggested that they included at least two distinct phases of work. The outer walls were of substantial construction and made of

yellow stock bricks and concrete. The inner walls were built of red brick. The outer faces of the inner walls were neatly pointed as if they had been originally intended to be exposed. This suggests that the original red brick magazines were free standing and that they were subsequently enclosed within new walls of concrete and yellow stocks, then covered with soil.

From the observation of this nineteenth century battery site it has been possible to define a series of development phases using standard archaeological procedures. Although some contemporary military records survive they have yet to be fully analysed; however, it may well be that the field evidence contains otherwise unrecorded information and it should be possible to combine the available information to produce a detailed history of the battery.

3.4.10.4 The South Lines (**DS/L**)
Situated on the Western Heights above Dover, defending the approaches to the town stands a massive moated fortress, constructed between the late eighteenth and late nineteenth centuries. A substantial section of the outer fortress moat (The South Lines), running up from the cliff-edge to the main Citadel, was removed by the new A20, allowing the very solid construction of the nineteenth century moat walls to be recorded. Several adjacent structures of the Second World War were also recorded, providing evidence of the continued use of the fortress for defence into the mid-twentieth century.

3.4.11 *Burial Sites*
The sites of two post-medieval burial areas were examined during the course of the A20 project, although no significant human remains were recovered. In addition, excavation and documentary research demonstrated that the Church of St Nicholas in Bench Street with its reported grave-yard had, in fact, never existed here.

A pipe-trench cut across the lower slopes of the Western Heights went through an area known as 'The Graves', traditionally believed to be site of Dover's plague pits. In the heart of the medieval town re-aligning of Queen Street exposed a brick burial vault. A close watching brief was maintained at both sites, although nothing of great significance was revealed. Summaries of the two sites are given below:

3.4.11.1 'The Graves ', Western Heights (**DS/G**)
On the slopes of the Western Heights, above the Pier District, lies a small area of ground adjacent to the old road to Folkestone, known as 'The Graves'. This isolated spot is the traditional site of Dover's seventeenth century plague cemetery, although documentary evidence suggests that it continued to be used for burials until the nineteenth century. During the winter of 1991/92 a detailed survey of the area, now heavily wooded, was undertaken ahead of the cutting of a trench for a new branch sewer across the site. Two eighteenth - nineteenth century brick-built vaults and a smashed gravestone were discovered. The gravestone records members of the Becker family who died between 1796 and 1842 and this has been salvaged for storage at Dover Museum. The pipe-trench subsequently cut across the cemetery area, under close archaeological supervision, failed to reveal any further significant features or human remains.

3.4.11.2 Zion Chapel, Queen Street (**DS/Q**)

Excavations for the realignment of Queen Street revealed fragmentary traces of the foundations of the nineteenth century Zion Chapel which stood on this site until the 1970s. The top of a single brick-lined vault was recorded in the new road bed. Its contents were not excavated.

3.5 Summary of the results of the archaeological assessment

3.5.1 Analysis of the assessment results of the archaeological investigations (see above) indicates that a considerable amount of significant information has been recovered. The particular strength of the field evidence gathered is its broad coverage of substantial areas of the town that had previously seen very little archaeological work. Data concerning a range of topics relating to the early history of Dover are present within the archive. Coverage, however, is somewhat variable and certain areas have produced rather more detailed evidence than others. The densest concentration of significant discoveries falls in the Bench Street region, within the heart of the historic town and this must form a key area for further research and study.

3.5.2 Apart from the internationally important Bronze Age boat which has been reported elsewhere, evidence for prehistoric activity was limited. A small assemblage of flint artefacts was recovered, principally from the area of Archcliffe Fort.

The sites of two post-medieval burial grounds were briefly examined but no significant human remains were recovered.

3.5.3 Information on the nature of the Roman harbour has been significantly enhanced by the discovery of the timber mole structure discovered at the end of Bench Street, together with the sedimentological evidence recorded here and in adjacent areas. More detailed consideration of this recorded information needs to be undertaken in the light of previously recorded data concerning the Roman settlement and port at Dover.

3.5.4 The important evidence for late Saxon, medieval and early post-medieval settlement in the Bench Street region (i.e. DS/C, P, Q, I, M, T and U) represents the most extensive set of data recovered from the project. Here, some reasonably detailed investigations, across a block of land about 100 metres square, lying between the centre of the historic town and the early water-front, allow a number of key research questions to addressed. These include: the nature of the medieval town wall and its gates; the character of the buildings within the walled town; the origins of settlement and the street system; the status of the inhabitants of the area; the nature of the Three Gun Battery; the extent of post-medieval occupation in the area; and pottery supplies to the area. Analysis of the recorded information will allow a general overview of the evolution of this part of Dover to be attempted and the results of this work will form the main elements of the publications proposed below.

3.5.5 Although significant quantities of information concerning the location and infilling of the Paradise basin were recorded, together with details of the structures and deposits within the area of Snargate Street and the Pier District, no discoveries of major significance were made. Much of the recorded evidence is in the form of negative information. Little of the data recorded relates to the documented early phases of occupation within the Pier District and the scope for detailed analysis of settlement evolution there is fairly limited. Nevertheless, a number of useful observations were made. Of particular interest is the evidence for clay-pipe manufacture off Limekiln Street.

3.5.6 Examination of the post-medieval artillery defences situated on the western side of the town at Archcliffe Fort and the South Lines Battery has provided information concerning the evolution of these structures. Several details do not seem to have been previously recorded. The new data add to our understanding of the works, which formed key elements in the later defences of the town and its harbour.

3.6 The Artefactual Data

Nearly 11,000 artefacts were recovered during the field-work, including prehistoric flints, pottery, clay tobacco pipes, building material, a large sculptured stone fragment, glass and metal objects. The numbers of artefacts of different material categories are listed by site below. With the exception of the pottery, clay pipe assemblage from Limekiln Street and building materials, many of these finds are of post-medieval date and can contribute little towards the principal research objectives of the project.

The medieval finds from the Bench Street area, especially the pottery, however, provide an important collection that can be studied in relation to the larger assemblages of material recently recovered from the Townwall Street filling station site. Collectively, the clay tobacco pipe assemblage offers a good opportunity to examine this industry in Dover and, importantly, contains evidence of kiln technology, with implications outside the local importance of the collection. The building materials, including, brick, slate, tile, architectural stonework and mortar, will enhance the explanation and understanding of the changing use of materials for structures in Dover during the medieval and post-medieval periods.

3.6.1 Flint artefacts

Some 210 flint artefacts were recovered from the project. Initial assessment indicates that the majority of this material is of Neolithic or Bronze date, with one artefact of the Mesolithic period. Whilst this material is of little intrinsic value, it does provide useful comparative material with other flint assemblages from the Dover area (including the Bronze Age boat site) and will contribute to the dating of the stratigraphic sequences recorded.

3.6.2 Pottery

3.6.2.1 The project produced a total of 4980 sherds of pottery (101.56 kg), excluding clay pipe and delft tiles. Apart from one Iron Age and four Roman sherds, all this material is of post-Roman date and essentially reflects the location and historical development of the areas investigated. The condition of the pottery (wear, etc.) is variable. Most is generally fair to good but often quite fragmented with few whole profiles represented. Seventeen of the sites investigated yielded pottery, with the largest groups coming from DS/S, DS/C and DS/P (see table below).

The pottery assemblage is very heterogeneous with all the post-Roman pottery falling between *c*. A.D. 850 and 1950. There is no early or mid Saxon pottery present, the earliest pottery being a few sherds of late Saxon Thetford-type ware (*c*.A.D. 850 -1100) and some less diagnostic imports and local wares. Overall, the assemblage has two chronological strong-points, the early medieval (here *c*.A.D. 1075 - 1250), the twelfth century being particularly well represented (especially on the 'Crypt' site, DS/C), and the post-medieval (*c*.A.D. 1550-1850). The intervening medieval/late-medieval period is rather patchily represented, although some material is present on the 'Crypt' site (DS/C).

The level of imported (Continental) ceramics is high. Preliminary calculations based on the early-medieval sequence at the 'Crypt' site indicate that a third (32%) of pottery in use was imported, mostly from North France/Flanders and to a lesser extent from Normandy and the

Rhineland. For the post-medieval period the sources of pottery are more diverse with the Rhineland and Holland best represented. For the eighteenth century there is an unusually large collection of Chinese porcelain and other exotic wares - most of these derived from a supposed nineteenth century Antique Dealer's or collector's dump of over 200 vessels, which also includes an ancient Greek vase.

Site	Iron Age	Roman	Late Saxon	Medieval	Post-medieval	Total
DS/A	-	-	-	-	-	0
DS/B	-	-	-	-	420	420
DS/C	-	2	23	1337	701	2063
DS/E	-	-	-	-	38	38
DS/F	1	-	-	-	136	137
DS/G	-	-	-	-	-	0
DS/H	-	-	-	-	78	78
DS/I	-	-	-	52	11	63
DS/J	-	-	-	4	179	183
DS/K	-	-	-	-	-	0
DS/L	-	-	-	-	12	12
DS/M	-	-	-	-	66	66
DS/N	-	-	-	-	-	0
DS/P	-	2	6	552	111	671
DS/Q	-	-	-	7	8	15
DS/R	-	-	-	-	76	76
DS/S	-	-	-	-	825	825
DS/T	-	-	-	12	154	166
DS/U	-	-	-	-	83	83
DS/W	-	-	-	50	29	79
DS/Y	-	-	-	5	-	5
Total	**1**	**4**	**29**	**2019**	**2927**	**4980**

Table 4: Distribution of pottery across investigated A20 sites, by period

3.6.2.2. The ceramic material has been fully catalogued in accordance with normal C.A.T. Basic Catalogue procedures (i.e. by context, fabric, sherd numbers, weight and comments). However, in view of the importance of the assemblage and its significance for sites further inland it was felt that a more detailed analysis of fabrics should proceed simultaneously with the cataloguing. The basis of a Dover fabric reference collection was therefore established, particular attention being paid to unfamiliar wares and/or suspected imports. Extensive use of the microscope resulted in a large number of fabric categories and variants. Detailed fabric descriptions have been provided for the majority of fabrics and sketches and notes made of all significant items.

3.6.2.3 While the Dover A20 pottery undoubtedly remains significant, it has, since 1996 been significantly over-shadowed by the much larger medieval and post-medieval assemblage

from Townwall Street (approx. 43,000 sherds; see above) whose study is nearing completion. Many of the original research aims intended for the A20 pottery were, more appropriately, transferred to the study of the Townwall Street assemblage. Consequently, the aims/research objectives suggested for the original A20 pottery assessment may now be scaled down. The emphasis of the proposed A20 pottery study will now concentrate on the ways in which it differs from the Townwall Street site or extends our knowledge of pottery types present on that site and what this means for Dover as whole.

3.6.2.4 It should be noted that the Townwall Street and A20 assemblages do not exactly duplicate each other. At Townwall Street the bulk of the pottery dates *c.*A.D. 1150-1250. However, the report brief and financial considerations meant that the not insignificant amounts of post-medieval pottery from this site could not be discussed in any detail and nothing has been illustrated. This material awaits further work in the future. In contrast to the Townwall Street material, the A20 assemblage definitely includes pottery dating to the tenth-eleventh century as well as later material. The A20 also includes some significant groups of post-medieval pottery. Even allowing for the period of chronological overlap between Townwall Street and the A20, the latter includes some vessel forms and fabric variants not represented at Townwall Street. Both assemblages contain relatively few and poorly preserved ceramics for the period *c.* A.D. 1250-1450. At Townwall Street this appears to be due to a hiatus in activity on the site. On the A20 structures of this general period were exposed in the Bench Street but these were associated with few stratified deposits. The published Dover Castle excavation reports cover the earlier part of this period reasonably well (Rigold 1967; Cook *et al*. 1969). A complete typology of medieval ceramics could not be attempted on the basis of the A20 assemblage alone and is considered to lie well outside the scope of the proposed report.

3.6.3 Registered Finds

Some 1396 registered finds were recovered, of various material categories. The vast bulk of this material is of late or post-medieval date, and of is little potential to address the research objectives. Of more interest, however, are the artefacts recovered from the dated late Saxon, medieval and early post-medieval sequence of deposits in the Bench Street region (DS/C, I, J, M, P and Q etc.). These are associated with a series of deposits derived from a lengthy period of activity in this particular part of the town and their study should help with the study of several research objectives. The few coins recovered will provide some useful additional dating evidence to the more extensive pottery assemblage.

Finds from the medieval levels here include a dozen clench nails from contexts dated *c.* A.D. 1075-1250. These are more or less contemporary with a larger sample of similar objects recovered from the Townwall Street excavations. It is possible that these objects are derived from boat building activities in the area but they are more probably associated with house building.

A few items, such as a large fragment of medieval sculpture (see 3.6.6) are notable discoveries in their own right.

Material category	Number of Finds
Copper Alloy	69
Daub	87
Glass	535
Iron	317
Lead	6
Leather	14
Mortar	8
Silver	3
Flint and Stone	350
Tin	4
Wood	3
Total	1396

Table 5: Quantities of Registered Finds

3.6.4 Building Material

A significant quantity of roofing slate, brick and tile was recovered. Study of this will contribute to our understanding of the nature of medieval and post-medieval buildings in Dover.

Imported West Country slate occurs on sites in the Bench Street area throughout the medieval and early post-medieval deposits. The earliest dated contexts containing such material are of the twelfth century. It has been previously established that Dover was one of the ports to which slates from Cornwall and Devon were transported (Jope and Dunning 1954).

More commonly found was ceramic roofing tile, much of it probably manufactured at Tyler Hill, near Canterbury. This occurred in deposits dating the thirteenth century and later.

In Kent, bricks came into use during the thirteenth century but they do not appear to have been employed extensively in building work in Dover until the seventeenth century. A few bricks come from later medieval contexts in the Bench Street area, however and these may constitute some of the earliest yet found in the town.

Material Category	Number of Finds
Brick	351
Marble	8
Slate	313
Tile	1102
Architectural fragments	12
Purbeck Marble sculpture	1
Total	**1787**

Table 6: Quantities of Building Material

A dozen carved stone architecture fragments were recovered. These consist mostly of Caen stone, greensand, or ragstone with some possible Reigate stone. Identifiable pieces include door and window reveals, vault ribs and corbels. A number of *in situ* pieces were salvaged from the Bench Street undercroft and it is hoped that study of the style of these will assist with the dating of this structure.

Other unusual stone finds include occasional pieces of granite and non-local stone. Similar material was recovered from medieval Townwall Street, where it was suggested that the granite boulders found could have been derived from dumped ship's ballast.

3.6.5 Purbeck Marble Sculpture (Fig. 15)

A substantial fragment of sculptured stone was recovered from rubble on the seaward side of the town wall in the area of the Boldware Gate. Traces of cream-white gritty mortar adhering to its carved surfaces indicate that it had be re-used as a building stone within the upper courses of the curtain wall or the gate tower.

The fragment consists of the lower part of a tomb effigy of a priest, and is of Purbeck Marble from Dorset (Fig. 15). These effigies were mass-produced, mostly in Corfe Castle village, and were sent by water as far as was possible, being difficult to move overland. Effigies of ecclesiastics and knights are reasonably frequent throughout the thirteenth century. The priests are vested as if for mass, wearing alb (linen tunic with sleeves), girdle, stole with fringed ends and chasuble (bell-shaped outer garment). The chasuble falls into folds when the arms are raised.

Alb, stole and chasuble can be seen on the Dover fragment. The feet are missing, together with the dragon which may have been beneath the feet. The upper part of the effigy is also missing.

The probable date of the Dover effigy is *c*.A.D. 1280. There are many Purbeck Marble effigies of bishops, but fewer priests have survived. An example from Cirencester, Gloucestershire is very similar to the Dover example. On the Cirencester example the head is also lost, and the effigy is not in its original position, probably because of the rebuilding of the church.

It seems possible that the Dover effigy comes from a church and this was presumably either St Martin le Grand, St Peter's or St Mary's, all within 300 metres of the find-spot. The implied desecration of an important grave for building material during the construction of the town wall, perhaps no more than a century later, however, is somewhat unexpected. Is it possible that the effigy itself was never used, perhaps being damaged in transit? Presumably it had been shipped by sea direct to Dover from Dorset.

3.6.6 Clay Tobacco Pipes

The *Society For Post-Medieval Archaeology* have identified the systematic collection of pipes and the location of kiln sites as areas of particular importance where more work is needed (Anon 1988, 6). Despite this, only a small number of articles have been written on pipes from

Kent (Atkin 1989) and there is only one short note on pipes from Dover itself (Maynard 1969, 45-46). There is no account of the pipes or pipemakers from the county as a whole.

The A20 project has produced a total of 539 fragments of clay tobacco pipe (409 bowls and 130 stems) from a total of ten different sites:

Site	*Stems*	*Bowls*	*Total*	*Comments*
DS/B -91	15	16	31	
DS/C- 91	30	17	47	
DS/F- 92	11	6	17	
DS/H -91	3	1	4	
DS/J-91	10	1	11	
DS/L-91	3	1	4	
DS/M-91	8	5	13	
DS/P-91	3	1	4	
DS/R-91	29	358	387	Principally a kiln group, *c*.A.D. 1700-50.
DS/S-91	18	3	21	
Total	***130***	***409***	***539***	

Table 7: Distribution of clay pipes on A20 sites

The pipes range from seventeenth to nineteenth century in date. The majority of the fragments (387 pieces) came from **DS/R** where the bulk of the finds were recovered from a pit off Limekiln Street, containing pipe-kiln waste of *c.* A.D. 1700-50. This pit also produced about 20 fragments of kiln muffle from the pipe-kiln. Most of these pipes are marked HN or RN and represent two previously unrecorded Dover pipemakers, probably a father and son. They were making plain, London style bowls and, on some of the moulds, used a fleur-de-lys above the initials.

The other nine sites produced 152 pieces of pipe (51 bowls and 101 stems). Most of these groups are comparatively small and there do not appear to be any other contexts containing particularly significant assemblages of pipes.

The ratio of bowls to stems reflects the strong collection bias in favour of bowls from these sites. This makes it most unlikely that any pipes can be reconstructed to provide data on stem length. It also means that it will not be worthwhile carrying out any detailed statistical analysis of the pipes as a whole.

The majority of the sites have only produced small groups of pipes. These can provide some dating information but the groups are generally too small to be reliable in themselves. The main strength of this material lies in the fact that, collectively, it provides the first substantial sample of the pipes which were made and used in Dover.

The kiln group from Limekiln Street is of particular importance for two reasons. First, it defines the products of two previously unrecorded Dover makers and, secondly, the kiln debris will provide information about the production technology being used. The discovery

helps to confirm the documentary evidence which indicates that several pipe manufacturers were established in the Limekiln Street area.

3.7 The Ecofactual Data

Although it is now general policy to process bulk samples on site during the field-work phase, this was not the procedure adopted on the hectic A20 project. As a consequence, a significant number of samples still await processing. All this material has been carefully stored since the end of the field-work, initially at the Institute of Archaeology London and the Old Park ware-house near Dover. More recently, the material has been moved to Dover Museum's store at Deal and CAT's Kingsmead store at Canterbury.

3.7.1 *Sample collection and processing*

3.7.1.1 The quantities of samples, cores, monoliths and profiles recovered during fieldwork by the GSF team (Bates and Barham, 1993) are shown in Tables 3 and 8. Of these a total of 258 bulk samples (of which 138 came from bore-holes), 2 monoliths and 13 drill cores were processed during the assessment (but not necessarily reported upon). Lists of the samples collected, their locations and descriptions are held in the archive by Canterbury Archaeological Trust. Samples were taken from bore-holes, excavations and trench sections and varied in volume. Bore-hole samples comprised undisturbed U4 core sediments and disturbed (bulk) samples between U4 tubes. Sample processing has been described in detail by Bates and Barham (1993).

3.7.1.2 The on-site sampling strategy for archaeological contexts was selective. Only contexts that could provide useful environmental, economic and cultural data were sampled. These samples contain quantities of pottery, animal bone, fish bone etc. and will provide the basis for specialists analyses and reports on the various sites concerned. The size of the sample base varies from context to context but range generally from 2.5 litres to 20 litres per bag.

There are 142 bulk samples from medieval deposits, mostly pit fills, taken on the Crypt Restaurant site (**DS/C**) (see Table 9), clearly from nearby occupation. These pits stand in stark contrast to Townwall Street excavation which lacked the refuse pits associated with its occupation. Comparisons and contrasts should indicate environmental and economic differences between the two sites. Some early medieval/Saxon occupation material was also sampled. This has not been encountered before and may provide, together with those sampled in Bench Street, data to form the basis for an appraisal of the occupation and economic conditions in this area.

The Bench Street (DS/P) samples (59) vary in nature ranging from early medieval/Saxon occupations interleaved in the windblown sands (see above), occupation layers on chalk floors similar to those recorded on the Townwall Street site, medieval pit fills to river silts (see below).

The Fishmonger's Lane (DS/I) bulk samples (31) are derived from waterlogged deposits and river silts, dated to the period *c.* A.D. 1050-1225 and contain well-preserved flora and faunal assemblages as well as dumped material from the nearby occupation. This area appears to form a muddy backwater to the adjacent River Dour and seems to be used as a dumping ground for domestic refuse.

Geomorphological Zones	Number of profiles	% of total	Bulk samples	Cores	Monoliths
Zone I: Western Heights	21	24	89	0	36
Zone II: Undercliff area	18	20	95	0	2
Zone III: Town centre	50	56	888	45	8
Totals	**89**	**-**	**1073**	**45**	**46**

Table 8: Overall summary of site and sample data for Dover A20 project (see Table 3 for details of bore-holes in Zone III)

Members of the CAT team collected bulk samples from significant archaeological deposits during investigations in the Bench Street area (**DS/C**, **P** and **I**; see above 3.7.1.2). These samples came from specific medieval pit-fills, occupation layers and soil deposits and are detailed in Table 9 below. They are included in the Zone III material noted above (Table 8).

Site	Processed and Assessed	Awaiting processing	Total
DS/C (92 contexts)	28 (20%)	114	142
DS/P (32 contexts)	18 (10%)	41	59
DS/I (8 contexts)	5 (1.5%)	26	31
Total (132 contexts)	**51**	**181**	**232**

Table 9: Summary site and sample data for archaeological deposits in the Bench Street area

With the GSF material, sub-samples of 1-2 kg were taken from bulk samples for sedimentological and water-logged macrofossil investigation. The sediment was disaggregated with water and hydrogen peroxide (H_2O_2) if necessary, decanted into a 0.5 mm mesh sieve and gently washed. Some residues were mixed in a bucket with water to enable the charred plant remains to be floated off and decanted into a 0.5 mm mesh. The residues were then oven-dried at 50 degrees C and bagged. The residues were then sorted under a low power binocular microscope: > 2 mm was completely sorted, while between 2 and 0.5 mm was sorted until about 25% of the total extract had been observed.

All column samples (monoliths) were cleaned, recorded, photographed and, in some cases, sub-sampled for environmental assessment. All the cores were extruded from the U4 tubes, described, photographed and, in some cases, sampled at 1 or 2 cm intervals for assessment. All cores and monoliths have been kept in a cold store.

The following assessments were carried out:

3.7.1.1 Sedimentology (Williamson 1993; Bates 1999a; 1999b), 132 pages with diagrams and tables
3.7.1.2 Pollen (Branch and Lowe 1999), 11 pages, with graphs and tables
3.7.1.3 Diatoms (Cameron 1999), 5 pages, with table
3.7.1.4 Molluscs (Wilkinson 1999), 19 pages, with lists and tables
3.7.1.5 Insects (Cross 1999), 11 pages with tables
3.7.1.6 Plant Macrofossils (Fairbairn 1999), 9 pages, with table
3.7.1.7 Animal bones (Stewart 1999), 52 pages with graphs and tables
3.7.1.8 Fish bones (Irving, 1993, updated by Nicholson 1999), 39 pages with lists and tables

These assessments were initially produced immediately after the fieldwork, in 1993, at a time when the process of producing assessment reports was less well understood by specialists than it is today and before the current archaeological research aims and objectives had been properly formulated.

The limited resources available in 1999 allowed some updating of these original assessment reports but could not cover the costs of studying new material, extensive re-working of previously assessed samples or, in some cases, the data themselves. Accordingly, these detailed but now somewhat dated reports have not been re-submitted here, although they are readily available upon request to CAT. Their contents and conclusions have been summarised and re-assessed below by Keeley and Parfitt, in the light of the revised research objects for the project.

3.7.1.1 Sedimentology
Sedimentological assessment was carried out on core samples from bore-holes DSC-2 and TWS-5, subsamples from monoliths DAF M3 and GSF 21 M1 and on bulk samples from bore-holes TWS-5, DBS-2, and DES-1 and open trenches GSF 2,5,6,18A, 18C, 41 (4103), 43 (4302) and 44 (4401).

DSC-2 cores
Particle size analysis was carried out on 26 samples. Loss on ignition (water, organic matter and calcium carbonate contents), pH and total phosphate determinations were carried out on 30 samples. Magnetic susceptibility was measured on 55 samples and X-Radiography on 4 sections of the bore-hole. Particle size analysis, organic matter content and X-Radiography confirmed the characterisation of the sediments; calcium carbonate content was high and this was reflected in high pH values. Total phosphate and magnetic susceptibility were low, indicating a lack of influence of human activity on the deposits investigated.

TWS-5 cores
Particle size analysis was carried out on 8 samples; loss on ignition, total phosphate and pH determinations were carried out on 9 samples. Particle size analysis did not prove useful in this case but loss on ignition and pH clearly reflected the sediment types present. Total phosphate concentrations were low.

DAF M3 subsamples
Particle size and loss on ignition analysis were carried out on 9 samples. Magnetic susceptibility and X-Radiography were carried out on the whole 0.5 m monolith (the former at 2 cm intervals). Particle size distribution was fairly constant throughout the monolith and organic matter content and magnetic susceptibility were uniformly low.

GSF 21 M1 subsamples
Magnetic susceptibility was very low. X-Radiography showed up fine laminations in the lower part of the monolith.

Bulk samples
Particle size distribution, clast roundness and composition were compared for bulk samples from bore-holes TSW-5, DBS-2 and DSE-1 and samples from open trenches GSF 2, 5, 6, 18A, 18C, 41 (4103), 43 (4302) and 44 (4401). The results confirmed the characterisation of the sediments observed in the field.

3.7.1.2 Pollen
The identification of pollen assemblages may provide both a regional and local picture of vegetation history. Sub-samples for a pollen stratigraphic assessment were obtained from cores from bore-hole DSC-2, taken from the lower Bench Street/Townwall area of Dover. Only 9 samples from the 16 assessed produced pollen of a sufficiently high concentration to be included in the report and these came from the peat (base to 690 cm below present-day ground surface), the overlying fine-grained silts (690-514 cm below present-day ground surface) and the upper organic silts (514-490 cm below present-day ground surface). The peat in this bore-hole has been radiocarbon dated to 2810 ± 65 BC and the organic silt to AD 260 ± 70 (Bates 1999b).

The pollen-stratigraphic record indicated a sequence of vegetation change in the lower Dour Valley from approximately 2800 BC (and possibly earlier) to the Roman period. Low pollen values of Elm and declining values of Lime at the base of the sequence (peat unit) are 'typical' of Middle Holocene pollen diagrams from southern England, including the records from deposits associated with the Dover Bronze Age boat (Lowe *et al*. 1998). Following the period of peat formation, there was a significant change in the environment which may be correlated with pollen evidence for localised human activity, including cereal cultivation, occurring between approximately 2800 BC and AD 300. After this the sedimentary records and pollen data indicate marine inundation of the area.

3.7.1.3 Diatoms
Diatoms are algae which are identifiable to species by their highly ornamented valve structure and are highly sensitive to water quality. Thus they can be useful environmental indicators and are especially sensitive to salinity. A diatom assessment was carried out on 8 samples selected from bore-hole DSC-2 to determine, in particular, the potential of diatom analysis for reconstructing the former salinity conditions in the Dour valley. Diatoms were well preserved in 4 samples, poorly preserved in 1 and absent from 3 samples. It appears that diagenetic processes have resulted in the loss of the diatom record from the basal and upper

sections of the sequence examined. The uppermost diatomaceous sample (4.90-5.35 m, L 8-9 cm, sandy peat) contained a poorly preserved freshwater to brackish assemblage. The other 4 diatomaceous samples contained a mixture of marine-brackish diatoms (with significant freshwater components), i.e. 4.90-5.35 m, L40-41 cm (sandy silt), 5.50-5.95 m, L19-20 cm (laminated silt), 6.10-6.55 m, 35-36 cm (silt/clay) and 6.80-7.25 m, L2-3 cm (tufa/silt). There appears to be a trend in salinity from marine-dominated diatoms at the base to brackish water dominated at the top, indicating a reduced influence of tidal conditions in the later sediments.

3.7.1.4 Molluscs

Molluscs are influenced by their immediate microclimate and are thus most useful for reconstructing local rather than regional site conditions, both on land and in water - including vegetation composition, water quality and water depth. Marine molluscs, particularly larger taxa, also often form part of the human diet and may provide information about the economy of a site.

The Crypt site

Nine samples from separate contexts (pit fills spot dated to various phases between AD 875 and 1175) were examined. Of the few shells recovered from each sample, most were marine species and most of these were fragmentary, suggesting that they may have been re-deposited. The species range was limited to periwinkle (*Littorina littorea*), mussel (*Mytilus edulis*) and oyster (*Ostrea edulis*), suggesting these remains may represent food debris.

Fishmonger's Lane (medieval)

Two samples were examined, context 24 being stratigraphically above context 25 and both associated with horizons of peat and waterfront structures. Neither sample contained many mollusc shells and these were dominated by small fragments of marine bivalves (mainly mussel and oyster), which probably represent re-worked food refuse.

Bench Street (medieval)

Two samples were examined, both of which were from pit fills and contained only marine mollusc shells, preservation of which was reasonably good. It is likely that the shells represent food residues dumped in the pits. Species composition of both samples was similar and dominated by two species of periwinkle (*Littorina littorea and L. saxatilis*), both of which are common in the inter-tidal zone and easily exploited. Oysters were also common in both samples. Other species found included limpet (*Patella vulgata*), dog whelk (*Nucella lapilis*), mussel and cockle (*Cerastoderma edule*). All species are edible and all (except oyster) are commonly found in inter-tidal or shallow salt water environments and could have been collected by hand, rather than by boat.

Bore-holes

Core samples from three different bore-holes were examined:

DST-2

Two samples were assessed. In one (5.5-5.9 m) preservation was very poor but in the other (5.7-6.0 m) a well-preserved and diverse assemblage of largely terrestrial molluscs was

found. No detailed core descriptions are available to explain this difference. However the sample from 5.7-6.0 m contained a large allochthonous (not *in situ*) assemblage, deriving from deposits dating not only from the later prehistoric period but also the Late glacial period, and it is thus difficult to reconstruct the environment at the time of deposition from these data.

DSC-2

Four samples were examined from tufaceous and peat strata: 4.3-4.5 m, 4.7-4.9 m (no descriptions available), 7.4-7.85 m (organic silt) and 8 m (no description available). The two upper samples post-date a C14 date of 260 AD ± 70, obtained on peats at 4.99-5.01 m, while the lower samples pre-date a C14 date of 2810 ± 95 BC at 7.09-7.11 m (Bates 1999b). Mollusc shell preservation was generally poor. The samples from 4.3-4.5 m and 4.7-4.9 m contained a very restricted freshwater assemblage. The samples from 7.40-7.85 and 8.0 m were of completely different species composition to those above, dominated by taxa of terrestrial preference, although marsh elements are also present. Both assemblages were dominated by *Trichia hispida*, a species which can live in most terrestrial environments, but there were also large numbers of *Vallonia costata*, normally interpreted as being of open country preference. However, the latter is known to live in some more shaded environments and the rest of the assemblage was predominantly shade-loving, so it seems deposition occurred in a closed environment - probably not woodland but possibly long grassland. Clearly, therefore, there is a change from a freshwater to a terrestrial environment in the sediment sequence represented by this bore-hole.

TWS-5

Four samples were examined: 6.48-6.60 m (no description available), 6.60-7.05 m (tufa/peat), 7.05-7.13 m and 7.13-7.20 m (no descriptions available). The molluscan assemblages can be dated between 2340 ± 85 BC and 6380 ± 110 BC. Shell preservation was generally poor. The sample from 6.48-6.60 m was dominated by *Pisidium* sp. The assemblage represented an aquatic environment (probably slow-moving or still water with shade) with dry land vegetation nearby, superficially similar to samples examined from the nearby Dover Bronze Age boat trench (Wilkinson 1998). Too few shells were recovered from 6.60-7.05 and 7.05-7.13 m to interpret, except to say the contemporary environment was wet. 7.13-7.20 m suggested an environment similar to 6.48-6.60 m but the presence of the freshwater limpet (*Ancylus fluviatilis*) indicated fast-flowing water with a clean stable surface (e.g. rocks).

3.7.1.5 *Insect remains*

Insect remains are best preserved under waterlogged conditions and, like molluscs, provide evidence of the local rather than regional environment and economy. Six samples were assessed: 2 from Townwall Street (DST-91), 2 from the Crypt site (DSC-91) and 2 from Fishmonger's Lane (DSI-92).

DST-91

GSF 21, Crypt 0.00-0.30 m was a slightly sandy silt which appeared to have been laid down in fresh water. Resting eggs of at least four species of water flea (Cladocera) were abundant, as were Ostracods. 'Outdoor' beetles were predominant and aquatic beetles were well-represented. Waterside and strongly plant-associated taxa were also present. Remains of

dung beetles and species suggestive of turf were present, possibly indicating land grazed by herbivores in the vicinity. The second sample (DSC-2, 4.3-4.5) was sand and produced a flot too small to allow interpretation of the insect remains.

DSC-91

Sample 255 was sandy silt and produced a flot with one fragment of unidentifiable insect cuticle. Sample 331 was organic sandy silt containing abundant charcoal, seeds and other plant material but only one identifiable insect fragment.

DSI-92

Samples 29 and 24 appeared to be part of the same deposit of wet humic silt. Sample 29 produced a small flot in which insects typical of rotting organic matter made up about half the individuals and taxa recorded. The dry decomposer component was fairly large and included a group of insects termed 'house fauna'. The presence of a human flea (*Pulex irritans*) and several human lice (*Pediculus humanus*) suggests that at least some of the insects came from material originating in human dwellings. Fouler decomposer species were represented by six taxa, including single individuals of four species of *Aphodius* dung beetles. Sample 24 produced a small flot containing a beetle assemblage similar in implication to Sample 29, indicating the presence of domestic rubbish in the area.

3.7.1.6 *Plant Macrofossils*

The remains of plants of economic importance (crops, etc.) can provide evidence of agriculture, social organisation and diet, while those from natural or human-influenced ecosystems can point to local vegetation history. 24 samples were assessed from archaeological deposits (10 bulk samples from the Crypt site DS/C and 2 from Bench Street) and from naturally deposited alluvial sediments (1 bulk sample - 24 - from below the excavation trench at DSC, 2 bulk samples from sewer trench Section 57 DS/I, 4 bulk samples from between core sections in bore-holes DS/C-2 and TWS-5 and 5 spot samples from cores from bore-holes DS/C-2, TWS-5 and BH2). The archaeological bulk samples were from a range of features including pit-fills, occupation layers and a garderobe dating from *c.* 900-1400 AD. The Bench Street samples were from two directly associated deposits covering only a very short period (early to mid-twelfth century AD). The alluvial samples from DS/I were from two directly associated deposits spot dated to the late eleventh-early twelfth century AD and contemporary with samples from DS/C and Bench Street (DS/P).

A wide range of plant taxa and types of plant remains were preserved in the samples by charring, water-logging and mineralisation, including seeds, wood, moss and stem fragments. Charcoal fragments were present in most of the archaeological samples, dominated by oak (*Quercus* L. sp.) and beech (*Fagus sylvatica* L.) with smaller quantities of field maple (*Acer campestre* L.), poplar/willow (Salicaceae L. sp), alder (*Alnus glutinosa* L.) and hazel (*Corylus avellana* L.) - all species found widely in Kent and south-east England. Large assemblages of charred seeds of cereals, fruits, nuts and weeds were present in samples from Bench Street and the Crypt. Cereal grains were abundant - oat (*Avena* cf. *sativa* L.) was the most abundant and ubiquitous but bread wheat (*Triticum aestivum* L.), hulled six-row barley (*Hordeum vulgare* L.) and rye (*Secale cereale* L.) were also found. other probably cultivated crops included lentil (*Lens* L. sp.) and possibly pea (*Pisum sativum* L.). Many wild

plant species were also present, including fragments of hazel nut shell, seeds of weeds of crops and a plum stone. Large assemblages of mineralised seeds were recovered from eight contexts in the Crypt and Bench Street, dominated by fruit seeds, including fig (*Ficus carica* L.), strawberry (*Fragaria* sp. L.), grape (*Vitis vinifera* L.), bramble (*Rubus fruticosus* L.) and raspberry (*Rubus idaeus* L.).

Waterlogged seed assemblages were abundant and diverse in many samples, particularly the bore-holes. The most ubiquitous and abundant seeds were those of common arable weeds and plants of disturbed ground, including chickweed (*Stellaria media* L.), fat hen (*Chenopodium album* L.), red shank (*Polygonum persicaria* L.), shepherds purse (*Capsella bursa-pastoralis* L.), corn-cockle (*Agrostemma githago* L.) and cornflower (*Centaurea cyanus* L.). Some samples contained abundant seeds of aquatic, semi-aquatic and river-edge taxa. A few grassland plants and several species typical of scrub, woodland edge and hedge habitats were present. Three taxa of saline environments were noted: seablite (*Suaeda maritima* L.), sea club rush (*Scirpus maritimus* L.) and sea campion (*Silene maritima* With.).

3.7.1.7 *Animal bones* (Stewart 1999)
The A20 project produced a total of weight of animal bone in excess of 74 kilograms. This material was unevenly spread across the investigated sites. Half the sites produced little or no bone at all (Table 10). By far the largest assemblages were recovered from deposits excavated in the Bench Street area (mostly DS/C and P). Well over half the material from this area came from well-stratified medieval layers, including occupation deposits and pits fills. Bulk samples were taken during excavations at the Crypt site (DS/C), Bench Street (DS/P) and Fishmonger's Lane (DS/I) and a significant number of these still await processing, so that more material may be anticipated when these are examined.

The animal bones recovered came from two main sources: bulk samples wet-sieved through a 0.5 mm mesh and hand collected during excavation. They were also collected from the sewer trench and from between the bore-hole cores. The bore-hole bones, however, were of little use for analysis.

The material most likely to shed light on economy and environment comes from the **DS/C** and **DS/P** sites. This medieval and early post-medieval assemblage from the Bench Street area was abundant, although it may include some residual material. The Fishmonger's Lane bones were also of some interest and appeared to be a mixture of residual and primary waste material.

For the eleventh to twelfth centuries in the Bench Street area ovicaprids were the commonest species group being exploited, followed by cattle and then pigs. (A broadly similar situation occurs at the Townwall Street site). Domestic fowl were present and egg shell was found. There is no significant wild element to the diet during this period.

Site	Weight (g)
DS/A	-
DS/B	1180
DS/C	40,217

DS/E	-
DS/F	225
DS/G	-
DS/H	1010
DS/I	550
DS/J	5545
DS/K	-
DS/L	2
DS/M	-
DS/N	-
DS/P	22,036
DS/Q	15
DS/R	225
DS/S	-
DS/T	3175
DS/U	-
DS/W	168
DS/Y	5
Total	**74,353**

Table 10: Distribution of animal bone from the Dover A20 project, by weight (grams)

Processing of the outstanding 181 bulk samples from the Bench Street area (see above; Table 9) may be expected to produce further significant amounts of animal bone for analysis. Collectively, this assemblage will provide useful comparative material for the larger collection of Townwall Street animal bone.

3.7.1.8 *Fish bones* (Ichthyofauna)
Processing of samples recovered from medieval and early post-medieval deposits in the Bench Street area (**DS/C**, **P** and **I**) produced a total in excess of 8000 individual fish bones. The largest groups of material came from stratified medieval deposits on **DS/C** and **DS/P**. These bones were assessed from bulk samples sieved through a 0.5 mm mesh. Species found included cod, haddock, whiting, herring, mackerel, red bream, Salmonidae, eel, thornback ray, spurdog, conger, sardine, sea bass, bream, sand eel and halibut. The remains from medieval deposits in Fishmonger's Lane and Bench Street indicated local processing and consumption of sea fish.

Processing of the outstanding 181 bulk samples identified (see above, Table 9) may be expected to produce further fish bone for analysis. Extrapolating from the material already recovered, it may be anticipated that somewhere between 26,000 and 71,000 more fish bones will be contained within the unprocessed samples, but conceivably there could be more. Such a significant assemblage will provide highly valuable comparative material for the Townwall Street assemblage (see below).

3.8 Storage and Curation

3.8.1 The archaeological field-work generated a total of some 2,490 recorded contexts, illustrated by 228 drawn plans, 167 drawn sections and about 5000 photographs, supplemented by an extensive series of hand-written notes, sketches and descriptions. The finds recovered include 4980 pot-sherds, 539 clay tobacco pipe fragments (including kiln wasters), 1774 pieces of building material and 1396 registered finds. There are also significant amounts of animal bone, fish bone and marine shell, together with four substantial timbers from the Roman harbour structure with several more from under the medieval town wall. In addition, the palaeo-environmental work yielded 1073 bulk samples, 45 cores from bore-holes and 46 monoliths. Details of the observed stratigraphy were recorded with photographs, drawn sections and profiles and an extensive series of hand-written notes, sketches and descriptions (Barham *et al*. 1995). All these field-records have been checked and indexed and security photocopies made.

3.8.2 Due to its geographically and chronologically wide-ranging content, the Dover Sewers/A20 field archive represents a highly important resource for archaeological research within the town. Following completion of the analysis stage, the complete archive (including all field records, photographs, artefacts selected soil samples and material additional generated during the analysis) will be organised, indexed and packaged for deposition with Dover Museum for long-term storage. Copies of the archive will be sent to the County SMR at Maidstone and the NMR.

3.8.3 All material held in Dover Museum will be stored according to the registered guidelines of the Museum and Galleries Commission. The artefactual and processed environmental material will be packaged into suitable containers, clearly labelled and placed in an appropriate storage facility (Western Road, Deal). Following the analysis stage, all artefacts, in particular the post-medieval material, will be subject to retention criteria following National Museums Association guidelines.

3.8.4 *Conservation*
With exception of the Roman timbers currently undergoing PEG treatment in Portsmouth (funded by Dover Museum), all artefact conservation required has already been carried out during the field-work and original assessment phases of the project.

4 Statement of Potential

4.1 Specific Research Themes

4.1.1 *Prehistoric Occupation Evidence* **(Research Objectives 1, 13)**
Prehistoric studies are generally not well developed in east Kent, although sufficient information is available to show that this was a rich area, comparable in physical terms with the Wessex chalklands but apparently significantly different in the nature of its archaeology. In addition to palaeo-environmental studies, Wilkinson (1990) has highlighted the need for study of the prehistoric origins of Dover and its hinterland.

Excluding the Dover boat to be described in a separate report (Clark forthcoming), the prehistoric remains recorded on the A20 do not include any major sites or assemblages worthy of independent study as part of the present post-excavation project.

4.1.2 *The Roman Harbour* **(Research Objectives 1, 2, 13)**
The existence of a significant Roman settlement at Dover has long been known and its prime importance as a port is now abundantly clear. Nevertheless, what remains much less well-known is the arrangement of the actual harbour installations themselves. These were clearly fundamental to the origins and continued survival of the Roman settlement, with the topography and natural infilling of the river estuary being key factors in determining their form and evolution; yet all these matters are still very imperfectly understood. Wilkinson (1990) has listed the study of the Roman harbour installations as a key research objective for the archaeology of Dover and this subject was identified as a research topic at the start of the A20 project.

A considerable quantity of accurately recorded sedimentological information was recorded during the A20 project, together with the remains of a new harbour mole. Taken in conjunction with the limited records of previous discoveries, some attempt at an overall reinterpretation of the nature of the Roman haven at Dover can now be made. For the first time this will be based upon sound geological observations, rather than antiquarian and archaeological speculation about the position and extent of the estuary.

The timbers recovered from the new harbour mole at the end of Bench Street are hopefully sufficiently large to allow their dating by dendrochronology and this work is now in hand. In order to set the new timber mole in context it will clearly be necessary to re-assess the earlier observations and discoveries of harbour structures below the town, attempting to integrate this evidence with the environmental information. Some reconsideration of the function and dating of the Roman light-houses in relation to the harbour works (including the use of Classis Britannica fabric tiles in their construction) is also now possible.

Re-assessment of the nature of the Roman haven at Dover may be considered against of our knowledge of the nature of the adjacent Roman settlement (summarised in Philp 1989). The levels data recorded can hopefully contribute to a consideration of the height of Roman sea-level.

4.1.3 *The Anglo-Saxon Settlement and Harbour* **(Research Objectives 1, 3, 13)**
Despite its importance as indicated by the documentary evidence, details of the archaeology of Anglo-Saxon Dover remain scarce. The substantial body of information from the excavations of the 1970s and 1980s is not available for study. The rather more limited evidence found during work on the A20 does provide some useful information, primarily in a negative form, concerning the nature of the topography and settlement at Dover in the post-Roman period.

Prolonged investigation revealed no evidence for any Anglo-Saxon occupation in the area of Snargate Street or the Pier District and it now seems clear that both these areas were not colonised until much later. There is limited evidence for activity/occupation at the southern end of Bench Street but clearly the main town lay elsewhere. However, it is equally clear that the southern end of Bench Street was dry land and did not lie in the sea. Analysis of the palaeo-environmental information recorded should allow some further attempt at identifying the general position and extent of the post-Roman harbour, whilst study of the material from Bench Street will hopefully provide some information on settlement activity.

4.1.4 *The Norman Settlement and Harbour* **(Research Objectives, 4, 5, 6, 8, 13)**
The evidence for Norman activity recorded in the Bench Street area is worthy of detailed examination, since there has been virtually no previous work in this region, in contrast to extensive work undertaken throughout the nearby city of Canterbury. A detailed study of the ceramic material of this period that was recovered would be also be extremely useful and would provide good comparative material for the Townwall Street assemblage. An examination of the imported wares should help highlight the significance of the town as a port.

The evidence for medieval occupation in the Bench Street region takes on a new significance and importance in the light of the detailed work undertaken on the Townwall Street filling station site. Comparison of the character of these two geographically separate parts of the medieval town has great potential for enhancing our understanding the early history of Dover. Were the two areas directly comparable? If not, what were the differences and what this does mean in terms of the structure of the town?

Much of the field and environmental evidence recorded the A20 project could be presented as a topographical map.

4.1.5 *The Medieval Townwall and Gates* **(Research Objectives 1, 6, 7, 13)**
Of all the Kentish medieval walled towns, perhaps least is known about the now lost defences of Dover, yet it is clear that their construction was a major undertaking involving considerable expense over many years. The function of the wall as a sea defence needs to be considered together with the effect its construction had on the size of the town, the position of the harbour and the wall's military value in relation to the Royal castle on the hill.

The information recorded provides some useful details about the nature of Dover's lost seaward defences, together with evidence for at least two of the town gates. Since nothing has been published on the town wall since the beginning of this century, it is important that the information recorded during the present work is reported in detail. This information will need to be set against the historical evidence now made available by Dr Sweetinburgh.

For the first time some detailed account of at least part of Dover's town defences can be attempted. The form of the walls may be compared and contrasted with the defences of other walled Kentish towns and the Cinque ports as evidence of their relative status.

4.1.6 *Structures within the Walled Town* **(Research Objectives 1, 5, 6, 8, 13)**
The extensive range of information recorded in the Bench Street, Fishmonger's Lane, Mill Lane block, bounded by the town wall with its Boldware and Butchery Gates on the south, provides the ideal opportunity to undertake an in-depth study and to publish an account of this once important quarter of old Dover. Under the sea in Roman times but apparently within the area of the contemporary harbour on the evidence of the new Roman timber mole recorded, the area was reclaimed throughout the early medieval period, ultimately to be occupied by some fairly substantial masonry structures from the thirteenth and fourteenth centuries, implying that the area was then occupied by the wealthier classes. The Bench Street tower represents a highly interesting individual structure which deserves to be fully researched from both a local and a regional view-point. Historical documents record the existence of almshouses and mills between Bench Street and the river; detailed examination of these documents could allow some correlation with the recorded structures to be attempted. The palaeo-environmental evidence must provide the topographical background for the origins of settlement in this area.

The Bench Street study area can be readily extended to adjacent Queen Street where further limited observations were made and to Flying Horse Lane with its probable evidence for a late medieval bridge over the river. Closely bound up with any detailed study would be a consideration of the origin of the street system in this area (see below).

4.1.7 *The Medieval and Post-Medieval Street System* **(Research Objectives 1, 6, 7, 9, 10, 13)**
With documentary and environmental work providing some of the essential background, examination and interpretation of the field records should considerably advance our understanding of Dover's street system. Specifically, excavations along the line of both Bench Street and Fishmonger's Lane were observed, allowing observations of the earlier levels of these streets, which do not seem to become formalised until the later medieval period. The development of the street pattern seems to be closely bound-up with the phases of reclamation of the old estuary and the general evolution of settlement in the Bench Street area.

4.1.8 *The Later Medieval Harbour* **(Research Objectives 1, 4, 9, 13)**
Supplemented by a study of the field evidence from the south end of Bench Street, a study of the available documentary and palaeo-environmental information should be of some help in determining the something of the nature and location of the later medieval harbour at Dover. This work will hopefully provide a clearer understanding of the harbour developments that occurred in the post-medieval period. Timbers recorded in front of the town wall at the end of Bench Street may be associated 'the Wyke', apparently a late medieval sea-defence, to which much attention is paid in the town accounts. It seems possible that this structure might also have formed some sort of quay-side. No other traces of medieval harbour structures were recorded and it is beginning to look as if Dover was not extensively provided with such installations during the medieval period. If this is the case, publication of the data recorded

during the A20 project should be of considerable assistance to future researchers concerned with this key topic.

4.1.9 *The Pier District and Post-Medieval town* **(Research Objectives 1, 9, 10, 12, 13)**
Clearly, documentary evidence provides a considerable amount of information concerning the development of the Pier District and Snargate Street region, although this has never been fully researched. The archaeological and palaeo-environmental discoveries should amplify the written evidence. A detailed, combined study should allow the production of some account of the evolution of this region of Dover.

Analysis of the documentary evidence together with a study of the chronological and spatial distribution of the recorded building remains should allow something of the stages of colonisation of the foreshore area to be at least partly defined. Particular attention will be paid to the evidence for early settlement.

4.1.10 *Medieval and post-medieval pottery supply to the town* **(Research Objective 8)**
Apart from occasional notes, there have been no significant groups of medieval or post-medieval pottery published from Dover for nearly 30 years (then from Dover Castle). Although since 1996, the A20 assemblage has been somewhat over-shadowed by the much larger medieval assemblage from Townwall Street, the A20 pottery assemblage remains significant, as it contains a broader chronological range of material.

Nor do the Townwall Street and A20 medieval assemblages exactly duplicate each other. At Townwall Street the bulk of the pottery dates *c.*A.D. 1150-1250. The A20 assemblage in contrast definitely includes pottery dating to the tenth - eleventh century as well as later material. The A20 also includes some significant groups of post-medieval pottery. Even allowing for the period of chronological overlap between Townwall Street and the A20, the latter includes some vessel forms and fabric variants not represented at Townwall Street. Both assemblages contain relatively few groups of ceramics for the period *c.* A.D. 1250-1450. At Townwall Street this seems to reflect a hiatus in activity on the site which, on the evidence from the present project, does not seem to be represented in the Bench Street area. Comparison of the medieval pottery assemblages from east of the river at Townwall Street and west of the river in the Bench Street area should allow some consideration of the any similarity or differences between pottery supply to these two regions. Any notion of a social distinction between the main medieval town, around Bench Street and the isolated fishing community east of the river, at Townwall Street, will need to viewed against the evidence of the ceramics.

The level of imported (Continental) ceramics in the A20 assemblage is high. Preliminary calculations based on the early-medieval sequence at the Crypt site indicate that a third (32%) of pottery in use was imported, mostly from North France/Flanders and to a lesser extent from Normandy and the Rhineland. For the post-medieval period the sources of pottery are more diverse with the Rhineland and Holland best represented. For the eighteenth century there is an unusually large collection of Chinese porcelain and other exotic wares. As a major importer and redistribution centre for imported wares, and a major consumer (and possibly exporter) of local and regional wares, an understanding of the ceramic sequence at Dover

will doubtless be of relevance to other more inland sites in Kent and possibly further afield. The range of imported wares in particular could provide an important comparative resource for other specialists researching the archaeology of medieval ports.

4.1.11 *Artillery Defences* **(Research Objectives 12, 13)**
The earliest artillery structure, in the form of the Three Gun Battery, is a discovery of some significance. Its history and development may be partially reconstructed through certain historic documents but the size, construction and topographical relationship of the structure to the walled town has been greatly clarified by the field work. The structure forms an important discovery worthy of detailed study and publication.

Archcliffe Fort and the South Lines Battery adjacent, form an important group of later military structures on the lower slopes of the Western Heights, which reflect developments in coastal artillery defences from the seventeenth to twentieth centuries. A detailed study of the available documentary evidence concerning these structures in conjunction with the field evidence should provide a considerable amount of new information, particularly concerning the early history of Archcliffe. Such a detailed study ought to lead to a useful, publishable report. A detailed history of the evolution of Archcliffe Fort has yet to be undertaken. The present work at the Fort could serve as a starting point for an in-depth study of this interesting but little known monument.

4.1.12 *Burial sites* **(Research Objectives 9, 13)**
The limited evidence from the two burial sites investigated provides little new information. The plan produced for 'the Graves' should be a useful reference for any future developments in the area and the work has served to re-focus attention on this little known town burial site. The head-stone recovered here gives some useful history on the Becker family, once well-known in the town.

4.2 Environmental Evidence

4.2.1 Individual categories of palaeo-environmental material

4.2.1.1 *Stratigraphy and Sedimentology* **(Research Objectives 1, 2, 3, 4, 9, 13)**
Initial assessment has demonstrated that detailed examination of gross sediment morphology linked with targeted analyses (e.g. particle size and organic matter determinations) can be used to characterise the deposits encountered along the A20 road and sewer route. Since this work was done, considerable progress has been made on recording and interpreting sediments within the Dover area. A review of the cores taken during the fieldwork should be carried out in the light of these recent developments, including the analytical results from the assessment (loss on ignition, phosphate analysis, magnetic susceptibility and particle size analysis) and radiocarbon dating of selected samples should be carried out. This will allow the production of a sub-surface ground model and a single (composite) master sequence for the sedimentological changes within the impact area, which can be tied into the development of the Urban Archaeological Database for Dover.

An understanding of the depositional environment of the sediments is also needed in order to interpret the included biological remains. Detailed examination of morphology and sediment texture will enhance our understanding of sediment formation. The particle size distribution of a sediment reflects its rate and mode of deposition. For instance a predominance of fine particles (clays and silts) suggests slow deposition in still water (i.e. a low energy environment) whilst coarser materials, such as sands and gravel, indicate rapid deposition and moving water (i.e. a high energy environment). Study of the particle size distribution of mineral sediments using finger texturing will provide information about water flow, sedimentation rates and the effects of increasing human activity within the Dour valley.

4.2.1.2 *Pollen* **(Research Objectives 1, 2, 13)**

Pollen preservation was variable but generally good enough to provide a preliminary interpretation of the vegetation record. The radiocarbon-dated pollen-stratigraphic record from Bore-hole DSC-2 indicated a sequence of vegetation changes in the lower Dour Valley from approximately 2800 BC to the Roman period. Pollen evidence provides both a local and regional picture of the vegetation. Detailed pollen analysis (linked to a programme of radiocarbon dating) of the sedimentary sequence and comparison with results from sediments associated with the Dover Bronze age boat (Lowe *et al* 1998; Keeley, forthcoming) will provide further information on the vegetation history and the nature of human activity in the area during this period.

4.2.1.3 *Diatoms* **(Research Objectives 1, 2, 13)**

Diatom preservation varied in the samples assessed and, because of the predominantly calcareous nature of the sediments, the specialist has recommended that no further work should take place (Cameron, *pers. comm.*). However ostracods, although not assessed as part of the A20 project, were generally well preserved in the tufa/silts surrounding the Dover Bronze Age boat (Robinson 1998) and could be used as indicators of aquatic environment and water quality. Ostracods are a diverse group of small bivalved crustaceans. Their valves preserve well in a wide variety of deposits and assemblages can provide quite specific environmental information. Equally, it may be possible to use foraminifera - marine Sarcodine Protozoa that possess tests (shells) which may be preserved - as indicators of environment and salinity, since there are many species which have narrowly defined niches. Previous work in the Paradise basin (Bates *pers. comm*.) has indicated that forams are preserved in sediments in Dover and these remains can tell a detailed story.

4.2.1.4 *Molluscs* **(Research Objectives 1, 2, 3, 4, 13)**

Mollusc preservation was variable but generally good enough to provide useful information about the local environment. Analysis of molluscs recovered from samples from Dover has demonstrated a complex of depositional environments spanning the period from 11,000 BC to the medieval period. The molluscan data generally supported the scheme of deposition proposed by Bates, with important assemblage differences being noted from aeolian (wind-blown), colluvial (hill-wash), marine and fluvial environments. That these environments can be recognised from the associated molluscan remains (despite variable shell preservation) demonstrates the value of molluscan analysis in the Dover area as a tool for palaeo-

environmental reconstruction. It was recommended, however, that no further work is carried out on archaeological deposits from the medieval period.

4.2.1.5 *Insect remains* **(Research Objectives 1, 2, 3, 4, 6, 13)**

A very limited number of rather small samples was assessed from the A20 project but the results, along with analyses of sediments associated with the Bronze Age boat (Allison 1998), have demonstrated the potential of waterlogged deposits in Dover to preserve insect remains, which may be used in the reconstruction of past local environments and human activities. For analysis much larger samples should be processed and identification made to species level wherever possible.

4.2.1.6 *Plant macrofossils* **(Research objectives 1, 3, 5, 6, 13)**

A wide range of plant remains was recovered from the samples assessed, although the assemblages were of varying quality. Overall the plant remains provided a poor basis for interpreting pre-medieval environments but would be useful for reconstructing the wider environment of the Dour valley in the medieval period. Samples from medieval alluvium and contemporary archaeological deposits preserved a wide range of charred, mineralised and water-logged plant remains, which have the potential for detailed reconstruction of the environment of Dover and its surroundings and plant use in the town from the tenth to fourteenth centuries.

4.2.1.7 *Vertebrate remains* **(Research objectives 1, 5, 6, 13)**

Animal bone was recovered from thirteen separate sites (194 contexts). The bulk of this material (65.5 kg) came from stratified medieval and early post medieval deposits in the Bench Street region (**DS/C, P, I, J** & **T**). Bone preservation here was generally good. The bone material most likely to provide reliable economic and/or environmental evidence came from the Crypt site and Bench Street (**DS/C** and **DS/P**) as these are the largest groups of material recovered (71.5 kg). Processing of the outstanding 181 bulk samples identified may be expected to produce further material for analysis.

Extrapolating from the material already recovered, it may be anticipated that somewhere between 26,000 and 71,000 fish bones will be contained within the unprocessed samples, but conceivably there could be more. Combining this material with that already recovered (more than 8000 bones) will form a very significant assemblage that will provide highly valuable comparative material with the Townwall Street assemblage, where some 80,000 fish bones from well-dated medieval contexts were examined. The bulk of these Townwall Street contexts were of late twelfth-thirteenth century date.

The assemblage of animal and fish bones recovered from the medieval deposits in the Bench Street block provides important groups of material which can be compared with the larger assemblage recovered from medieval Townwall Street (*c.*250 kg). The material collected from the medieval chalk floored buildings in Bench Street is directly comparable, both in terms of dating and deposition, with the Townwall Street assemblage, which should allow an interesting comparison between the two groups to be made.

4.2.2 Integrated Statement of Palaeo-environmental Potential

The original palaeo-environmental assessment (Bates and Barham 1993, Bates 1999b) identified three main areas of interest:

4.2.2.1 The Western Heights late-glacial zone contained extensive molluscan assemblages stratified within fine-grained (loess-like) sediments, which could provide palaeo-environmental evidence and be compared with results from other sites (e.g. Holywell Coombe). However within the context of the lower Dour Valley no provenanced archaeological material has been recovered for this period and thus it is not relevant to the research aims and objectives of the current A20 project.

4.2.2.2 The town centre harbour basin area, contained complex sedimentary units of prehistoric to Anglo-Saxon date with a wide range of biological remains, approximating to the plan of the outer Roman harbour. Considerable stratigraphic data from previous work (Barham and Bates 1990) and from the bore-holes and trench/excavation areas examined in the A20 project can provide the basis for answering all the basic research questions.

The assessments indicate that many of the sediments contain identifiable and countable pollen suitable for the construction of regional pollen diagrams (Branch and Lowe 1999). The occurrence of molluscan remains indicates that local 'snap-shot' environmental reconstruction should be possible for the main sediment units (Wilkinson 1999). Foram and ostracod remains were not assessed but are likely to be present within both freshwater and brackish sediments. Ostracods were analysed in sediments from the Dover boat trench (Keeley, forthcoming) and foraminifera have been extracted and identified from sediments within the Paradise Basin. Both types of remains may indicate local environments and water conditions. Sufficient organic residues are available for radiocarbon dating if required. Plant macrofossils, animal bones and insect remains were not recovered in sufficient abundance for further work to be recommended.

4.2.2.3 The town centre area contained considerable evidence for medieval occupation and economy and these contexts were sampled extensively for biological remains. The assessments (Fairbairn 1999; Irving 1993; Stewart 1999) indicate that animal bones, shell and plant debris are abundant in the samples and predominantly reflect the economic activity of Dover's inhabitants. Furthermore, the nature of the urban habitat is well-represented in the plant and insect remains. All of this information thus combines to provide important detail concerning the nature of the daily lives of the medieval inhabitants of this part of Dover. Whilst the evidence from the present investigations may in some ways be considered as rather limited, its importance has now been greatly enhanced because it provides comparative material for the lager sample of contemporary material recovered from the eastern side of the town on the BP filling station site.

5) Revised Aims and Objectives

5.1 Significant information concerning many specific topics relating to many of the original research objectives was recorded during the course A20 field-work. The publication of most significant aspects of this information, taking into account more recent discoveries and developments, forms the ultimate objective of the proposed analysis. A range of published accounts concerning the principle discoveries made are proposed (see below). In addition, information recorded during the A20 project will provide important raw data for incorporation into the Urban Archaeological Database planned for Dover and to be funded by English Heritage.

5.2 The Original Research Objectives of the Project and Fieldwork Results

5.2.1 *How has the topography and environment of Dover changed from prehistoric times to the present? What influence has human activity had on those changes ?*
Published palaeo-environmental data for east Kent largely refers to the Wantsum Channel and Romney Marsh. These are large, open marshland tracts, very different in character to the deep, narrow Dour valley cut through the chalk downlands and located roughly mid-way between them. With the recovery of significant quantities of sedimentological samples on the Dover A20 project, exciting prospects exist in Dover to study palaeo-environmental records that relate more closely to the chalk downlands (the focus of much prehistoric activity). Additionally, the complex marine sequences present in the Dover samples, considered with the dated archaeological remains, present a unique opportunity to examine the relationship of the sea to human activities, complicated by the major geographical changes in the area over the last three to five thousand years. Such evidence needs to be considered with other archaeological information to produce a comprehensive account of our current state of knowledge. This should provide a sound footing upon which all future work can be based.

5.2.2 *What form did the Roman harbour take? How did it disappear and why did infilling occur ?*
Sedimentological evidence for the Roman harbour basin was recorded and a short section of a previously unknown timber harbour mole was revealed at the end of Bench Street. Study of the palaeo-environmental evidence should allow something of the origins, nature and extent of the Roman harbour estuary to be described. The new timber mole should provide some useful dendrochronological dates. All this new evidence will need to be set against the previously established information regarding the Roman haven and its adjacent forts and settlement. The study should provide a considerable advance in our understanding of the Roman haven at Dover and a detailed publication paper ought to follow from this.

5.2.3 *Where was the Anglo-Saxon settlement and harbour? What form did it take ?*
Evidence for limited late Anglo-Saxon activity was recorded on the sand ridge in the Bench Street area, although nothing earlier than *c.* A.D. 850 seems to have existed here. Stratigraphic evidence, recovered from bore-holes in Bench Street and in open sections at the Crypt site, is available for the earlier Saxon and later Roman periods. This evidence provides a physical link between the Roman and Saxon archaeology, and contains information pertinent to examining changes consequent to the infilling of the harbour basin and the development of the later Saxon landscape. Despite a careful, prolonged search no sign of any

Anglo-Saxon settlement was revealed in the area of the Pier District or Snargate Street and the existence of such a site here now seems to be extremely unlikely.

The Anglo-Saxon deposits located in the Bench Street area, although limited in extent are of some significance. They clearly indicate that the sand ridge deposited in the old Roman harbour, was in existence by the ninth century A.D. This was sufficiently stable to allow some limited activity here but the nature and extent of the deposits recorded indicate that this was not in the centre of the Anglo-Saxon town. Seemingly the Bench Street area occupied a position between the main Anglo-Saxon town and the sea. Beyond Bench Street, the evidence for Anglo-Saxon settlement is negative. The postulated western 'wic' settlement now appears to be a 'geographical impossibility'. Collectively, the recorded information helps to more closely define the extent of Anglo-Saxon settlement at Dover; clearly the main occupation area lay outside that covered by the A20 project. Nevertheless, the Bench Street evidence provides a useful contribution to the study of the origins of the post-Roman town and deserves to be published.

5.2.4 *Where was the medieval harbour and what form did it take ?*
No clear evidence for medieval or Anglo-Saxon harbour works was revealed but within the walled town organic sediment exposed in Bench Street and Fishmonger's Lane appears to represent material that gathered in a wet ground environment representing the final remains of the previously more extensive harbour basin. These deposits were subsequently buried under soil and rubble which seem to represent attempts at reclaiming ground in order to allow expansion of the medieval street system and settlement.

With the construction of the town wall the harbour area must have moved further to the south. There is clear evidence that the sea had washed against the town wall in the area of Bench Street and the discovery of several substantial vertical timbers on the outside of the wall, adjacent to the site of the Boldware Gate could represent part of a quay, or a series or mooring posts, quite possibly forming part of a sea defence described in contemporary documents as 'the Wyke'.

It seems likely that the passageway of the Boldware Gate itself was flooded high tides and its function in relation to the medieval harbour will need to be considered. The place-name 'The Bench' applied to the area adjacent to Boldware Gate may also be connected with the later medieval harbour arrangements. Combined with information about the medieval settlement, the information outlined here makes a very useful contribution to our understanding of how the old Roman harbour basin became infilled and built over during the medieval period. The location and character of the medieval harbour remains less clear.

5.2.5 *What can be learnt about the economy of the town in the Anglo-Saxon and medieval periods*
Samples from the Crypt site, Bench Street and Fishmongers Lane have produced significant quantities of bone refuse, from both animal and fish. Other samples await processing and will no doubt produce further material. Whilst in many cases the assemblages are small and taphonomic problems may exist, this material represents an important data set. The economic data available for this part of Dover should enable diet in the later Saxon and medieval period to be studied. Furthermore, waterlogged material, containing plant

macrofossils and insects, from Fishmonger's Lane (and dated to the Norman period), will provide additional data on economic practices. Work on this material will provide valuable comparative data for information recovered from the Townwall Street excavations of 1996, located in an area thought to be situated on the less prosperous eastern side of the town.

5.2.6 *What was the nature of the medieval town ?*
Traces of medieval occupation were recorded over a considerable area of the town, centred on the Bench Street area. These remains range in date from *c.* A.D. 1050 to 1500 and include extensive traces of later medieval stone buildings, river-side walls, areas of street metalling, together with numerous earlier pits, occupation and consolidation deposits. We are thus in a position to provide some detailed information on the nature, development, layout and structure of this part of the medieval town. The stratigraphic evidence recorded below several old streets should allow the evolution of a significant part of the town's street system to be examined. The quantities of imported pottery will help define Dover's role as a port.

From a combined study of the above it will be possible to produce a fairly detailed topographical, chronological and environmental survey of the development of the south-western quarter of the medieval town, focused on the area around Bench Street. Such a study will form the principal report on the A20 project (see below) and will represent a major contribution to archaeological research in the town.

5.2.7 *What was the nature of the medieval town wall and gates ?*
Substantial lengths of the medieval town wall, together with two of its seaward facing gates, were recorded, off Townwall Street. There was clear evidence for the breaching of this wall by the sea in several places. Documentary evidence shows that damage to the wall by the sea was a common occurrence throughout the later medieval period. The eroded remains of the Boldware Gate were exposed, together with the base of the Butchery gate over the River Dour. Part of a stone tomb effigy was found in rubble adjacent to the Boldware Gate. Probably re-used as building material in the wall, this represents a very interesting find.

A description and study of the excavated remains in relation to the surviving medieval documents recording the construction of the town wall ought to provide some firm evidence about the seaward defences of the town - an under-researched subject be-devilled by antiquarian myth and speculation.

5.2.8 *How was Dover provided with pottery during the medieval and post-medieval periods ? Are its trading links reflected in its pottery supply?*
Whilst the pottery assemblage recovered from the A20 project is too small for any substantive statistical analysis, an important range of fabrics and forms has been identified. The assemblage as a whole now provides a highly important group of comparative material for the ceramics recovered from the Townwall Street excavation of 1996, located in another part of the town. Many of the original research aims intended for the A20 pottery have been, more appropriately, transferred to the study of the Townwall Street assemblage. Consequently the aims/research objectives suggested for the original A20 pottery assessment may be considerably scaled down. The emphasis of the proposed A20 pottery study can now

concentrate on the ways in which it differs from Townwall Street or extends our knowledge of pottery types present on that site and what this means for Dover as whole.

5.2.9 *What was the nature of the post-medieval harbour works in the Pier District ? How did the Pier District develop ?*
A significant body of archaeological data concerning the occupation of the old Pier District was recorded during the road building programme. No definite evidence for buildings earlier than the seventeenth century was revealed and there was certainly nothing of Anglo-Saxon or medieval date here. Clear evidence for the infilling of the original Paradise Harbour, initially with natural silts, followed by deliberately dumped soils, was recorded and sampled for environmental evidence.

The information recorded in the field needs to be set against and correlated with the picture built up from documentary sources to produce a detailed account of the establishment and development of the Pier District and its associated harbour works.

Despite prolonged observation in the relevant area no traces of the structures, particularly the two gun towers, relating to the original Paradise Harbour were revealed. Extensive deposits of sediment infilling the basin were exposed and sampled for environmental evidence. The largely negative evidence recorded does allow the precise position of the Paradise to be mapped. Study of the infilling deposits will allow the phases of silting and deliberate backfilling to be defined. The excavated pottery assemblages will form the basis for dating the recorded remains and deposits.

5.2.10 *What was the nature of development along Snargate Street/Limekiln Street, linking the Pier District and the old town? When did this take place ?*
A significant body of useful archaeological data concerning the occupation of the Snargate Street/Limekiln Street area was recorded during the road building programme. As found in the Pier District, no definite evidence for buildings earlier than the seventeenth century was revealed and again, there was certainly nothing of Anglo-Saxon or medieval date here. All this largely confirms the evidence suggested by historic maps and documents. With the exception of the clay pipe manufacturing evidence (see below), little further detailed archaeological study seems to required for the remains recorded in these areas. Nevertheless, the field-data provides a firm basis upon which future researchers can build. The recorded remains have helped significantly in confirming the chronological range of activity in this region and have much more closely defined its archaeological potential.

A pit yielding a significant number of clay tobacco pipes and associated manufacturing debris, clearly indicates the existence of an eighteenth century production site somewhere in Limekiln Street. Although documentary work suggests the former presence of clay-pipe makers in this largely industrial area, the present discovery represents the first tangible evidence for this and stands out as being a significant find, worthy of detailed publication (see 5.2.11 below).

5.2.11 *What can be learnt about clay tobacco pipe industry of Dover ?*

The A20 provided a significant quantity of clay tobacco pipes, including debris from an eighteenth century kiln. The kiln group is of particular importance for several reasons. It provides evidence of early industrial activity in the Limekiln Street area; it defines the products of two previously unrecorded Dover makers and it the kiln debris recovered will provide information about the production technology being used.

The main strength of the A20 assemblage lies in the fact that, collectively, it provides the first substantial sample of the pipes which were made and used at Dover. In particular, examination of the clay pipes from the Limekiln Street pit, together with the other examples recovered elsewhere on the project, would provide a good basis for a future study of the town's clay pipe making industry, which has never been considered in any detail. Publication of all the available material is thus required as a foundation for future research.

5.2.12 *What can be learnt about the later military defences of Dover ?*
At the end of Bench Street the substantially complete ground-plan of the late sixteenth century Three Gun Battery was recovered by means of excavation and salvage recording. This structure had been previously only known from documents and early maps and excavated evidence provides an important new addition to our knowledge of the early post-medieval artillery defences of the town.

Further to the west, within the nineteenth century defences of the Western Heights fortress was the South Lines Battery. This lay on the route of the new road and was fully investigated and recorded before demolition. A substantial section of the adjacent outer fortress moat (The South Lines), running up from cliff-edge to the main Citadel, and defending the western approaches to the town, was removed by the road, allowing the very solid construction of the moat walls to be recorded.

Work at Archcliffe fort yielded details of the nineteenth century entrance structure that had been added to the original seventeenth century fort. Traces of seventeenth and eighteenth century entrance bridges were also recorded on the same site.

Old army records appear to describe the later defences of Archcliffe Fort in some detail but preliminary examination of the records relating to the South Lines Battery suggests that there are more phases of development represented archaeologically than are detailed in military records so far examined. Earlier phases of Archcliffe Fort are probably less well documented.

A detailed history of Archcliffe Fort has never been written. The recent work has provided some information that could contribute to more a detailed historical and archaeological study of this interesting site.

Any account of Archcliffe Fort would of necessity require the South Lines Battery to be included, as these two sites are frequently described together in nineteenth century records. Representing a somewhat specialized study of an area rather isolated from the main town, it is not envisaged that such an account would form part of the current work and only a brief note on the investigation and its findings is proposed here.

5.2.13 *Can information obtained during the A20 study be used as a predictive tool to assist decision making regarding future planning and development strategies within adjacent parts of the town ?*
The A20 road scheme ran through important areas of the historic town (archaeological Zones C, D, E, F and G). The importance of the archaeological remains in Zone C was amply confirmed. Previously largely unknown, something of the nature of the archaeology within Zones E, D, F and G has also been established.

Data recorded during the A20 work has already provided some valuable information utilised during the preparation of several desk-top surveys undertaken ahead of proposals for further major developments in the town (Parfitt 1995; Parfitt 1997; Parfitt 1998). Copies of the field archive for the project will be made readily available for future researchers, with copies held at the National Monuments Record, the County SMR, Dover Museum and at the C.A.T. main offices in Broad Street, Canterbury. In the longer term, the data recorded can be incorporated into the new Urban Database planned for Dover to be funded by English Heritage. Additionally, the most important information, of particular use in archaeological research, will be set out in the publications proposed below. The data recorded along the line of the A20 overall provides a valuable resource for assessing the nature of the archaeological remains likely to be encountered in future developments in the maritime areas of old Dover.

6) Publication

6.1 Sufficient information relating to a range of the original A20 research aims has been recorded to warrant several detailed publications. These publication reports would seek to consider the more significant results of the A20 field-work in the light of recent research, both within the town and beyond.

6.2 The funding of two separate publications (with the option of a third and fourth, independently funded but as yet with no specific format details or timetable) concerning the wide-ranging work undertaken on the A20 project are here proposed. Detailed ('Level III') archive reports on each of the twenty-one archaeological sites investigated will not be produced. The principal medieval and post-medieval remains recorded will be described in a monograph (see below). Details of minor sites and other information can be placed in the proposed Urban Database for the town.

6.3 The four complementary reports proposed for publication are:

Report 1 (Medieval and post-Medieval Dover, Vol. 2)
Archaeological Investigations along the A20 Corridor, 1991-1993
(C.A.T. Occasional Paper)

Report 2 The Prehistoric And Roman Haven At Dover: Recent Work
(a paper for *Archaeological Journal or Britannia)*

***Report 3 Late Glacial Deposits at Archcliffe, Dover**
author to be decided (an optional paper for a geological journal; independently funded*)

***Report 4 The Holocene Deposits within the Dour Valley, Kent**
by Martin Bates (an optional paper for a geological journal; independently funded*)

6.4 Report 1 will be concerned with the more significant medieval and post-medieval archaeological remains recorded. It will be based upon a detailed analysis and description of the recorded deposits and structures on the various sites selected for study. This information will be amplified by study of the material remains recovered from these sites, especially the ceramics, small finds, animal and fish bone, together with any palaeo-environmental evidence. A very brief outline of the palaeo-environmental/geological background will introduce the report, since this is central to the development of the harbour, upon which the maritime quarters of the town under discussion are focused. Some consideration of the in-filling of the Paradise Basin will also be included, in particular the possible evidence for dumped ship's ballast here, as suggested by the presence of the microfossil *Nummulites variolarius* (Bates and Williamson 1999, 17). The extensive background documentary research originally planned will not now be included, since others are currently working on this material and summary accounts of much of their research are now available.

The bulk of the report will be concerned with discoveries made in the general area of Bench Street, close to the main centre of the medieval town, where a complex sequence of deposits

and structures was investigated across several separate A20 sites (i.e. DS/C, P, Q, I, M, T and U). The discoveries here included a series of late Anglo-Saxon occupation layers cut through by numerous Norman cess pits, that were in turn sealed by successive rammed chalk floors. These can now be seen to represent the remains of timber buildings similar to those excavated on Townwall Street. Subsequently, these timber buildings had been replaced by stone structures. The remains of two late medieval undercrofts and part of a defensive tower, known from nineteenth century records, were recorded, together with substantial portions of the medieval town wall and the remains of its two gates. A number of post-medieval remains were also revealed, most notably the late sixteenth century Three Gun Battery, of which a complete plan was obtained.

The report will form an important volume, on another part of medieval and post-medieval Dover, providing interesting contrasts with the remains recorded at Townwall Street, which have already been identified as being of national importance. Situated closer to the main focus of medieval settlement, the Bench Street area revealed a much longer and more complex sequence of occupation. This should allow some interesting comparisons and contrasts to be made between this area and the more peripheral Townwall Street site, east of the River Dour. Particular interest will attach to any evidence as to the social status of the occupants of these two different areas of the town.

Documentary evidence will additionally be used to set the field evidence in context but this will be limited to reference to the readily available sources. The final conclusions and discussion at the end of the report will include comparisons of the evidence recorded from the various A20 sites with any other relevant information from Dover, particularly the Townwall Street excavations. Topics such as settlement evolution, the development of the street pattern and continuity of property boundaries will be considered. Full details of the proposed layout of the report are given below.

6.5 Report 2 will be concerned with the geological development of the Dour estuary in relation to its use as a harbour and will include the results of the detailed bore-hole and other palaeo-environmental work undertaken during the A20 project. The study will be largely concerned with only the western side of the estuary, where the most detailed evidence was recovered. This will require the interpretation of previously analysed cores and stratigraphic data, together with study of two or three more specific cores containing key data. The resulting stratigraphic sequence will allow the recorded archaeological remains to be set into their proper context. This will include the dendro-dating of the wood samples recovered from the new Roman harbour mole. Description and discussion of the new mole in the light of previous evidence for Roman harbour installations at Dover should provide a much greater understanding of the character and development of the haven at this time. Collectively, the remains represent some of the most detailed information available concerning the nature and structure of any Roman port in Britain, with the exception of London.

Study of the prehistoric haven will include some further consideration of the local environment, before and after the deposition of the Bronze Age boat and will hopefully suggest, amongst other things, a context for the Mesolithic adze recovered from one of the deep cores. Such a study should for the first time allow the evolution of the Dour estuary to

be placed on a firm geological footing. The Archaeological Journal has previously carried two important papers on the theme of the Roman harbour at Dover (Amos and Wheeler 1929; Rigold 1969) - a third would continue this tradition. The extension of the paper to consider the prehistoric origins of the estuary would not be hampered by the period-specific nature of the journal (unlike *Britannia*, the most likely alternative). The proposed layout of the report is given below.

6.6 Report 3 would be concerned with the late glacial deposits exposed at the foot of the Western Heights in the area of Archcliffe. No archaeological remains were associated with these layers but they constitute a site of some geological interest and publication in an appropriate geological journal ought to be sought. Funding from an independent geological source is envisaged and the preparation of this report would not form part of the present project. The author(s) of such a paper have yet to be identified and there is presently no time-table for commencement of this project.

6.7 Report 4 would be optional and consist of a more technical paper for a geological journal, concerned with specific geological aspects of the work and with the field methodologies employed. Its principal author would be Dr Martin Bates who conducted the original field-work. Funding from an independent source is envisaged and again the preparation of this report would not form part of the present project.

6.8 Details of proposed funded publications (Reports 1 and 2):

REPORT 1

(Medieval and post-Medieval Dover, Vol. 2)

Archaeological Investigations along the A20 Corridor, 1991-1993

c) Settlement Development

Bibliography

List of Figures

Chapter 1: Introduction

a) Introduction and Summary -Summary of historic Dover and work on the A20 project *(500 words)*

b) Dover: Historical Background - Brief outline with special reference to the importance of the medieval town and the development of the western Pier District in the early post-medieval period.
(2-3000 words)

c) Background to the Project, Description of the A20 Route Corridor and Field Methods
General introductory comments. The local topography. Problems of field-work. Comment on results.
(2-3000 words)

d) Research Objectives and Previous Work in Dover *(1-2000 words)*
Brief over-view of previous work within the town (especially Townwall Street Filling Station site) and current research objectives.

e) Summary Overview of Archaeological Discoveries along the A20 Corridor *(2-3000 words)*
Brief survey of all remains exposed along the line of the urban section of the A20. Twenty-one sites, each with an identifying code letter. (Details of minor sites will only appear in this section; significant remains will be covered in more detail in subsequent sections). Reference to site archives.

f) Acknowledgements - List of individuals, companies and specialists etc. *(800 words*)*

(all word counts approximate)*

Chapter 2: Investigations within the Medieval Town

a) Introduction *(700 words)*
General comments on the medieval town. Description of the study area - a single block of land from the east bank of the River Dour to the western side of Bench Street

b) Summary of the evolution of the Dour Estuary *by Martin Bates, with Keith Parfitt*
(2-4000 words)
Summary over-view of the formation and silting of the Dour estuary based upon a more detailed palaeo-environmental report. A brief description of the prehistoric and Roman harbour that partially underlies the medieval town, will be followed by a consideration of the silting of the Roman harbour. The wind-blown sands in-filling the western side of the Roman harbour and their affect upon any Anglo-Saxon haven will be considered. The possible position and character of the medieval harbour prior to its re-location to Archcliffe will be discussed.

c) Anglo-Saxon Occupation (Bench Street, DS/C & P) *(800-1500 words)*

Very brief historical outline of Anglo-Saxon Dover. Description of the thin 'occupation' layers found in the top of the wind-blown deposit in the Bench Street area, followed by a consideration of their finds content, interpretation and significance.

d) The Town Wall and Gates *(4-6000 words)*
Historical outline of the medieval town wall (Dr S. Sweetinburgh) and its known archaeology. Description of the remains located on the A20: curtain wall at, York Street Roundabout; Bench Street/Townwall Street junction; Townwall Street, west (timber piles under foundation); Townwall Street, east. Description of the gates: new Snar Gate (no evidence); old Snar Gate (possible remains); Boldware Gate (sea damaged remains); Butchery Gate (base of tower and the 'Hole in the Wall' in river bed). The monk's effigy.

e) The Crypt Restaurant Site *(4-6000 words)*
Formally excavated trench along the line of the new sewer. Description of the excavated remains: numerous Norman cess-pits cut into the natural wind-blown sand; evidence for rammed chalk floors sealing these - now seems clear these are the remains of timber buildings, probably of the twelfth and thirteenth century; the later medieval undercrofted structure and its associated garderobe shafts; brief description of the (limited) post-medieval remains. Brief discussion and conclusions; the nature of the undercrofted structure; continuity of property boundaries.

f) Bench Street, Queen Street, Fishmonger's Lane, Mill Lane and the Bed of the River Dour
Observations during the course of deep excavations for the new sewer and A20 underpass. *(3-600 words)*

Bench Street: Description of the medieval and early post-medieval street frontage along the eastern side of Bench Street; details of the Crypt (undercroft opposite Restaurant); details of the Bench Street tower (part of ?defended merchants house). Evidence for earlier chalk floored timber buildings - their date and extent. Evidence for the line of the early road. *(5-6000 words)*

Fishmongers Lane: Description of the remains and deposits exposed in the sewer trench. Evidence for early metallings; the infilling of the old harbour basin - organic sediments and their dating (Norman). *(1000 words)*

Mill Lane and the Bed of the River Dour: Brief description of surviving remains under the road; walls exposed in the bed of the river leading up to Butchery Gate. Note on the Town Mill and its documented history. Flying Horse Lane bridge - ?late medieval work in fabric. *(1000 words)*

Brief discussion and conclusions - surviving remains; the course of the river; evidence for early streets; the infilling of the estuary. Discussion of the medieval undercrofts and their date. Consideration of the Bench Street tower (Derek Renn). *(3500 words)*

g) The Three Gun Battery and New Bridge *(2-3000 words*)*
Historical outline. Description of the excavated remains of the Three Gun Battery. Consideration of the dating, development and its location; comparable military structures in

Dover and beyond. The remains of Pattenden's House (seventeenth century). Brief description of the remains of the New Bridge and its significance.

(all word counts approximate)*

Chapter 3 Investigations in Snargate Street and the Pier District
a) Introduction - brief historical outline. Comment on the A20 discoveries (much negative evidence) *(800 words)*

b) Snargate Street and Limekiln Street *(2-3000 words)*
Description of the remains discovered along the line of the A20. Building remains - eighteenth century vaults under the Appledore Works, foundations of a seventeenth century Dutch gabled house. Statement on the dating of the various building remains and a consideration of the date of colonisation of the shore line here. The collapsed cliff recorded near the railway crossing. The pit producing clay pipe kiln waste. General conclusions - no evidence for an Anglo-Saxon *wic* settlement.

c) The Paradise Basin and Pier District *(3-4000 words*)*
Old cliff line below Archcliffe Fort. The Paradise Basin and its infilling (no evidence for Clarkes' Pier); palaeo-environmental evidence (dumped ship's ballast ?). Recorded building remains and their date. Overall consideration of the dating evidence from the Pier District in the light of the documented history. General conclusions - no evidence for an Anglo-Saxon *wic* settlement.

(all word counts approximate)*

Chapter 4 The Finds and Palaeo-Environmental Evidence
a) Introduction
b) The Coins
c) The Pottery
d) The Small Finds
Dress and Personal Possessions
Household Equipment
Transport Equipment
Structural Fittings
Occupations, Industry and Crafts
Diversions
Miscellaneous
e) Fish Remains
f) Animal Bones
g) Clay Tobacco Pipes

Chapter 5: Discussion

a) The Development of the Street Pattern *(2-3000 words)*
General consideration of the street pattern of the town. Consideration of the evidence from the Bench Street area - date of the streets here, early metallings, purpose. Ribbon

development along Snargate Street, date. The development of the Pier District street system - directly related to coastal morphology. Conclusions.

b) Burgage Plots, Property Boundaries *(1-2000 words)*
General consideration of the evolution of property boundaries within the Bench Street area. Comparison with the evidence from the Townwall Street Filling Station site. Conclusions.

c) Settlement Development *(2-3000 words*)*
General consideration of the evolution of settlement within the area of the A20. Comparison of the evidence of the Townwall street Filling Station site with the Bench Area (Anglo-Saxon occupation absent at Filling Station site; later medieval stone buildings rare). The development of Pier District, date based on archaeological evidence. Conclusions.
(all word counts approximate)*

(REPORT 2)

The Prehistoric and Roman Haven at Dover: Recent Work
(a paper for *Arch. Journ*. or *Britannia*)

Introduction - some general comments on ports and Dover *(500-1000 words)*

The Setting - coastal position of Dover and its geographical importance *(500 words)*
- general topography; origins of the valley *(800 words)*
- gap in chalk cliffs; fresh water *(200 words)*

The Prehistoric Haven - Ice Age gravels, mammoths teeth; Mesolithic adze
- tufa and peat formation; local environment- pollen
- the Bronze Age boat and its associated sediments
- post boat deposits; marine transgression
(8-12,000 words)

The Roman Harbour
a) ***Previous Discoveries*** - place-name evidence *(100 words)*
- outline history of research, Stukely, Amos and Wheeler, Rigold and Philp *(1000 words)*
- the nature of Roman Dover *(500 words)*
- harbour installations *(500 words)*
- sedimentological evidence relating to the Roman haven *(8000 words)*

b) ***Discoveries on the A20*** - the new timber harbour mole found in Townwall Street; site description,
detailed description of the timbers. Dendro dating. *(3-5000 words)*

The Saxon and Medieval Harbour
- documentary evidence)
- the Domesday water mill
- archaeological evidence
-*wic* settlement
- sedimentological evidence *(2-3000 words)*

Discussion
a) Prehistoric - use by prehistoric man
- origin of sediment deposits
- local environment *(1-3000 words)*

b) Roman - re-assessment of earlier discoveries
- the dating and function of the light-houses
- development and changes through time (late Roman fort sits across reclaimed ground).
- evidence of sea-level changes.
Roman sea-level
- the nature and extent of the Roman port - use by the CLBR
  - relations with other Roman ports (London, Richborough, Lympne and Boulogne
  - *(3500 words)*

c) Saxon and Medieval - was there a harbour here? *(1000 words*)*

(all word counts approximate)*

Provisional List of Figures

Fig. 1 Location map of Dover in relation to Roman roads, North France and other sites

Fig. 2 Outline map of prehistoric Dover (early)

Fig. 3 Outline map of prehistoric Dover (late)

Fig. 4 Sections through prehistoric deposits

Fig. 5 Outline map of Roman Dover

Fig. 6 Site plan of the new Roman mole

Fig. 7 Elevation of the new mole

Fig. 8 Section of deposits around mole

Fig. 9 Timber drawings

Fig. 10 Timber drawings

Fig. 11 Dendro dating graph (?)

Fig. 12 Sea level graph (?)

Fig. 13 Distribution map of Roman port sites (?)

7) Method Statement for the Preparation of Reports 1 and 2

The funding and publication of two separate reports (Reports 1 and 2, see above) concerning the principal results of the Dover Sewers/A20 work is proposed here. Other interesting (geological data) data could be published in reports funded by outside bodies (Reports 3 and 4). Only Reports 1 and 2 are considered here.

7.1. Task Breakdown for the Preparation of Reports 1 and 2

7.1.1 Project meeting

(Research Objectives; **1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13**)
(Task 1) An initial project meeting will be held to discuss the project with the principal specialists prior to their analyses. Senior project staff will attend this meeting:
KP, BC, PC, AR, PR, EA, HK, MB
All Senior Staff, 1 day each
Costs: travel & accommodation

7.1.2 Palaeoeconomic studies (Research Objectives **1, 5, 6**)

Well over one thousand samples were taken during the A20 scheme (see above **3.1.3**; Tables 8 and 9). All 181 bulk samples specifically taken from archaeological deposits in the Bench street area have been identified as requiring processing for finds and biological remains (Table 9). The on-site sampling strategy for archaeological contexts was very selective. Only contexts that could provide useful environmental, economic and cultural data were sampled. These samples contain quantities of pottery, animal bone, fish bone, etc. and will provide the basis for specialist analyses and reports on the various sites. The size of the sample base varies from context to context but range generally from 2.5 to 20 litres per bag.

The bulk samples (142) taken from the Crypt Restaurant contexts largely comprise medieval cesspit fill material, clearly from nearby occupation. These pits stand in stark contrast to the Townwall Street excavation, which lacked the refuse pits associated with its occupation. Comparisons and contrasts will indicate environmental and economic differences between the two sites. Some early medieval/Saxon occupation material was also sampled, which has not been encountered before and may provide, together with those sampled from Bench Street, data to form the basis for an appraisal of the occupation and economic conditions in the area.

The Bench Street samples (59) vary in nature, ranging from early medieval/Saxon occupation layers interleaved in the windblown sands, occupation layers on chalk floors similar to those recorded on the Townwall Street site, medieval pit fills to river silts.

The Fishmonger's Lane bulk samples (31) are derived from waterlogged deposits and river silts and contain well-preserved floral and faunal assemblages, as well as dumped material from the nearby occupation. This area appears to form a muddy backwater to the adjacent River Dour and seems to have been used as a dumping ground for domestic refuse.

7.1.2.1 (Task 2) Sample location and transportation.
The samples will need to be located in the storage at Deal, loaded and transported to Canterbury headquarters for processing and sorting.
BC, 1 day
EA, 1 day
KP, 1 day

7.1.2.2 (Task 3) Sample selection and processing.
All material not required for specialist analysis of biological material will be treated as follows: Bucket flotation will be carried out to produce a washover onto 0.5 mm mesh. Sediment remaining after the flotation process will be wet sieved to 1 mm. Mesh sizes may be increased to 2 mm or 4 mm depending on inclusions within the samples. Residues and washovers will be dried unless they contain significant quantities of organic material preserved by waterlogging, in which case they will be stored wet and kept in cold, dark conditions until they can be examined.
EA, 12 days

7.1.2.3 (Task 4) Sample sorting.
Residues will be examined for biological remains which will be removed and stored either wet or dry as appropriate. The mineral component of the residues will be discarded. Washovers will be examined to assess their contents. Biological remains recovered will he passed on to the appropriate specialists. Any pottery, small finds, slag or hammerscale, etc. recovered from the samples will be passed to the Finds Department at Canterbury Archaeological Trust.

(personnel to be decided; 2 people, 35 days each)

7.1.3 Site report preparation

7.1.3.1 Archaeological report on prehistoric and Roman harbour
(Research Objective: **1**, **2**, 3, 13)
(Task 5) A primary archaeological narrative will be prepared on prehistoric remains and the Roman harbour structures. Relevant previous discoveries in the town will be outlined.
KP, 10 days (writing main text).
BC, 1 day (collation of relevant field-work data).

(Task 6) Selected plans and sections will be prepared for publication. Illustrations will be hand-drawn, using standard pen and ink techniques, following broad conventions previously established for publications on Dover.
BC, 7 days

7.1.3.2 Archaeological site report on principal medieval and post-medieval sites
(Research Objectives**; 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13**)
(Task 7) A primary stratigraphic narrative will be prepared on the medieval and post-medieval sites selected for publication. Correlations between sites will be made where possible and a discussion of the important individual stratigraphic units and structures will be set-out by area and period.

KP, 75 days (writing main text).
BC, 15 days (collation of relevant field-work data).

(Task 8) Selected plans and sections will be prepared for publication. Illustrations will be hand-drawn, using standard pen and ink techniques, following broad conventions previously established for publications on Dover (as above).
BC, 60 days

7.1.4 Specialist finds analyses

7.1.4.1 Clay Pipe report
(Research Objectives; 9, 10, **11**)
(Task 9) An archive catalogue of all fragments recovered will be prepared. This will, so far as is possible, identify and date each piece. It will list all the marked and decorated pieces and present the information in such a way that the collection can be easily accessed for reference and further research. A context summary will be prepared. This will identify the number of pieces from each context and assess their overall date range. An estimate of the likely date of deposition will also be given if this is different from the overall date range.
DH, 7 days

(Task 10) A detailed analysis of the kiln group will be carried out and a report prepared. This will identify the range and number of different mould types represented and compare these with similar kiln groups. The style and particular workshop techniques employed will be described and set in regional context. The muffle will be examined and discussed in detail. The kiln technology represented will be described and set in national context.
DH, 7 days

(Task 11) Illustrations for publication at 1:1 will be prepared of all the different bowl types from the kiln group and of any of the muffle fragments or others that may be required for the report.
DH, 6 days

7.1.4.2 Medieval and post-medieval pottery analysis
(Research Objectives; 3, 5, 6, **8**, 9, 10, 13)
Study of the pottery will be targeted on a small assemblage of stratified groups from specific contexts. The primary aim will be to identify and describe new forms and fabrics found in Dover and to prepare an overview of the pottery. Comparisons with the material recovered from the 1996 Townwall Street site will be made.

7.1.4.2.1 (Task 12) Preparatory and Archival Work
a) Computerisation of basic pottery catalogue (currently *c.*2500 records) checking and printing out. PR, 5 days

b) Collection and archiving of material and records

Material to be collected from stores. Processed material to be boxed for storage at Dover Museum. A paper archive of all catalogues and records relating to the A20 pottery to be prepared for deposition in Dover Museum.
PR, 1 day

c) Consultation with excavator and familiarisation with site stratigraphy
PR, 2 days

7.1.4.2.2 (Task 13) Provision of a fabric list, including fabric descriptions and references where necessary. The current number of fabrics listed is *c.*180 but after recoding based upon subsequent research this should reduce to *c.*80. A quantified table will give the totals (sherds and weight) for each fabric.
PR, 10 days

7.1.4.2.3 (Task 14) Stratified Groups (SGs). Analysis of the following SGs or assemblages including additional quantification by EVEs. Processing of notes and data relative to these. Reassembly of vessels. Preparation of a report.

SG 1 DS/C pottery from the fillings of 21 early medieval pits, *c.*350 sherds (J.C., 4 days).

SG 2 DS/T (84) A sixteenth century group associated with the Elizabethan Three Gun Battery,
88 sherds (J.C., 1.5 days).

SG 3 DS/J (94, 98, 111) A small sixteenth century group immediately pre-dating the Elizabethan
Three Gun Battery, 26 sherds (J.C., 0.5 days).

SG 4 DS/C-176 *c.* A.D. 1650-75 dump of apothecary's wares, 141 sherds (J.C., 2 days).

SG 5 DS/C-70 early eighteenth century group, 50 sherds (J.C., 2 days).

SG 6 DS/C-64 early eighteenth century group, 45 sherds (J.C., 1.5 days).

SG 7 DS/R-3 *c.* A.D. 1740-50 group associated with clay pipe kiln debris, 55 sherds (J.C., 2 days).

SG 8 DS/B-156 *c.* A.D. 1820-30 small group includes local coarse-wares, 26 sherds (J.C., 1 day).

7.1.4.2.4 Processing of notes and data. PR, 1 day

J.C. Total, 15.5 days

7.1.4.2.5 (Task 15) General Research Questions and Comparisons. Mostly library research, interrogation of ceramic archive and one visit to E.H. stores at Dover Castle to examine material from earlier Castle excavations. Detailed below:

a) Geographic sources of pottery (PR, 2 days).

b) Comparison with Dover assemblages (PR, 2 days).

c) Comparisons with other ports etc. (PR, 1 day).

d) Ceramic evidence for late Saxon occupation (PR, 1 day).

e) Evidence for trades (PR, 1 day)

7.1.4.2.6 (Task 16) Specific Ceramic Research Questions

a) Imported wares
Visit Southampton Reference Collections (PR 1 day; Duncan Brown, 1 day). Visit MoLSS (London) reference collection (PR, 1 day; L. Blackmore, 1 day). PR, 2 days

7.1.4.2.7 (Task 17) Report Writing.
Production of final report
PR, 10 days

7.1.4.2.8 (Task 18) Selection of illustrations
Selection of items and providing notes for illustrator
PR, 1.5 days

7.1.4.2.9 (Task 19) Illustration Catalogue
Brief description of each illustrated vessel, including context, fabric code, common name, form, any other relevant comments.
At *c.*15 minutes per catalogue entry, approx. 175 items
PR, 5.5 days

7.1.4.2.10 (Task 20) Pottery Illustration
Approximately 175 items at *c.*3.5 items per day (*c.*123 from SGs)
WF, 50 days

7.1.4.2.11 (Task 21) Checking Illustrations
Checking at pencil stage and on completion
PR, 2 days

7.1.4.2.12 (Task 22) Maps and diagrams
Simplified plans and sections of stratified Group 1
BC, 2 days

7.1.4.2.13 (Task 23) Mock-ups of pottery illustrations
Preparation of mock-ups of pottery illustrations in proposed publication order. Includes reductions, cutting, ordering, pasting, numbering and provision of typed captions (NB: as a guide for final mounting-up stage)
PR, 3 days

7.1.4.2.14 Miscellaneous
a) (Task 24) Checking type script
PR, 1 day

b) Travelling costs
Standard return train fare Canterbury to Dover, £5.00
Standard return train fare Canterbury to London, £31.50
Standard return train fare Canterbury to Southampton, £59.60

7.1.4.3 Artefact Analysis
(Research Objectives; 3, 5, **6**, 9, 10)
(Task 25) A summary discussion of the artefact assemblage will be required, together with short catalogue entries for selected pieces.
AR, 8 days

Artefact Illustration
(Task 26) An estimated total of 20 objects will require illustration, rated at 3 illustrations per day,
including drawing, inking and mounting.
WF, 8 days

7.1.4.4 Building Material
(Research Objectives; **6**, **7**, 12)
(Task 27) A summary discussion of the building materials (tile, brick slate etc) recovered from the most significant contexts will be prepared.

Building Materials Specialist (to be appointed), 5 days

7.1.4.5 Dendrochronological Analysis
(Research Objectives; **2**, **7**)
(Task 28) Dendrochronological analysis and dating of the large timbers recovered from the Roman harbour wall and the wooden piles associated with the medieval town wall will be undertaken.

In progress (no charge)

7.1.4.6 Timber Illustration
(Research Objectives; **2**)
(Task 29) Detailed illustration of the Roman constructional timbers will be prepared for publication.

CC, 5 days

7.1.5 Stratigraphy/Sedimentology **(Research Objects 1, 2, 3, 4,** 9**, 13)**

7.1.5.1 A sub-surface stratigraphic model will be constructed for the town centre area against which archaeological and palaeo-environmental data may be compared.

7.1.5.1.1 (Task 30) This will require re-logging and description of bore-hole core samples, facies ascription of sediment types. The reason for doing this is that the stratigraphic data used to produce the framework stratigraphy was based primarily on field logs and original core descriptions. These are lithostratigraphic descriptions and no facies assignment was made of the units at the time of recording in 1993. Since then sedimentology has moved on and it is now imperative to assign facies to sediments (particularly when considering sediments that are likely to be time transgressive). This cannot be done without seeing the cores again, re-cleaning and re-describing them with this objective in mind. Finger texturing of sediments will be carried out to provide an estimate of particle size distribution at this time.
MB, 11 days

7.1.5.1.2 (Task 31) Integration of bore-hole and section data within an electronic framework to produce a sub-surface ground model. A survey of past publication records for integration with the electronic database will also be required as part of this task. A software package called Rockworks 98 will be used, which allows all stratigraphic data to be archived in electronic form, contour maps to be produced of key identified stratigraphic horizons (e.g. gravel surface topography), cross-sections and fence diagrams to be easily and rapidly constructed and sediment distribution maps created.
MB, 7 days

7.1.6 Integrated Palaeo-environmental Studies **(Research Objectives 1, 2, 3, 4, 9, 13)**

A lower Dour palaeo-environmental master record will be produced of landscape change from the early Holocene until the early medieval period, including integration of data from pollen and ostracod/foram studies. Following on from this will be the production of snap-shot palaeo-environmental pictures of key points within the Holocene history of the lower Dour valley, using pollen, foram/ostracod and molluscan data. These will include the late Prehistoric, late Roman and late Saxon periods for which extensive archaeological material has previously been gathered within the area.

The detailed palaeo-environmental records will be constructed from a combination of samples taken from the following bore-holes:

TWS-5
DCS-2
DBS3/4
QS1/2

The details of the individual cores are listed below:

TWS-5	6.0-6.45m, 6.6-7.05m, 7.2-7.5m
DSC-2	3.2-3.65m, 4.9-5.35m, 5.5-5.95m, 6.1-6.55m, 6.8-7.25m, 7.4-7.85m
DBS3	4.7-5.15m, 5.25-5.7m, 5.85-6.3m, 6.45-6.9m
DBS4	2.8-3.25m, 3.4-3.85m, 4.3-4.75m, 4.9-5.35m, 5.5-5.95m, 6.1-6.55m
QS1	4.55-5m,5.15-5.6m, 5.75-6.2m, 6.35-6.8m, 6.95-7.4m, 9.5-9.55m
QS2	4.35-4.8m, 4.9-5.35m, 5.5-5.95m

A combination of bore-holes is required in order to fully sample all sediment units within the basin area, as no single location contains all sedimentary units.

7.1.6.1 *Sedimentology* (Research Objectives 1, 2, 3, 4, 9, 13)

7.1.6.1.1 (Task 32) A review of past sedimentological data compiled for the assessment will also be carried out to extract the maximum returns on the data previously collected. The results will be reviewed in the light of the re-description of the borehole cores (Tasks 30 and 31).
MB, 10 days

7.1.6.1.2 (Task 33) A summary report will be written on all aspects of the sedimentological analyses and involves preparation of illustrations (either manually or electronically) and synthesising the results in a report.
MB, 10 days

7.1.6.2 *Radiocarbon dating* (Task 34) (Research Objectives 1, 2, 3, 4, 13)
The location of samples for dating can only be fully determined after re-investigating the core samples and assessing their state. It is likely that at least two samples will be needed from the base of the Roman harbour in either DBS3 or DBS4 to date the onset of the harbour in-filling. AMS dates will be required from the sediments recording the transition from freshwater to brackish water in TWS5 (it may be necessary to go to some of the Boat Trench samples for this material) - 3 or 4 dates are likely to be needed to calibrate this sequence. Also additional conventional samples will be needed from the freshwater sediments capping the initial harbour fill (in DBS3/4) to assess the pattern and speed of in-filling of the harbour basin. A total of 4 conventional C14 dates and 6 AMS dates (including C12/C13 ratios) is anticipated.

7.1.6.3 *Pollen analysis* (Research Objectives 1, 2, 3, 4, 5, 13)

7.1.6.3.1 (Task 35) Detailed pollen stratigraphic analysis
Samples will be selected from the bore-holes listed above after completion of the sedimentological work. A maximum sequence thickness of 8 m. of sediment will be investigated with initial sampling intervals of 10cm (to a maximum of 80 samples). Spot sampling of key stratigraphic horizons will be targeted following the production of the

framework biostratigraphy and integration of the extant and proposed additional radiometric age estimates.

The cores will be sub-sampled under 'sterile' laboratory conditions following quality control standards established within the Royal Holloway Geography Department. The core samples will be systematically cleaned using a scalpel blade and distilled water. Sub-samples will be removed from the core using a clean scalpel blade and spatula, and stored in labelled, clean glass vials.

The extraction of sub-fossil pollen grains and spores will follow a modified standard procedure developed by the Royal Holloway Geography Department. The method is highly suitable for the extraction of microfossils from fine and coarse detrital peat deposits and highly calcareous mineral-rich sediments. Samples will be selected in random batches to test for systematic laboratory effects during extraction, thereby maintaining the highest possible control on the quality of the results. The extraction procedure for each sample may be summarised as follows:

deflocculation of standard volume in 1% Sodium pyrophosphate
sieving through 125 micron and 5 micron apertures
removal of coarse organic detritus using acetolysis
mounting of pollen grains in glycerol jelly
The extracted pollen grains and spores will be recorded using an Olympus transmitted-light microscope with phase contrast and interference contrast facilities.

The analysis will provide high resolution pollen-stratigraphic information for a maximum of 80 samples. Pollen counts of more than 300 Total Land Pollen grains (Trees, Shrubs, Dwarf Shrubs and Herbs) will be attempted, with additional counts of pollen grains and spores of Aquatics and Pteridophytes (Ferns). This information will be presented as both pollen percentage and concentration diagrams. In addition a systematic, but subjective, assessment will be made of the levels of pollen deterioration. Since the primary consideration in this analysis will be to establish the local vegetation history and environment, differentiation of difficult taxonomic groups will be attempted throughout to provide maximum information. Two operators from the Palynology team will be responsible for the analysis to allow for cross-checking of results, thereby maintaining the highest possible control on the quality. The data will be tabulated and plotted using the *Tilia* and *Tilia*-Graph pollen programmes.
JL & NB, 13 days each

7.1.6.3.2 (Task 36) Detailed interpretation and discussion of the results
The reporting of the pollen stratigraphic results will focus on establishing the timing, nature and rate of local and, perhaps, regional changes in the vegetation. In addition, evidence of vegetation changes and human activities will be discussed with reference to previously published detailed pollen analyses from south-eastern and south-central England.
JL, 2 days; NB, 1 day

7.1.6.4 (Task 37) *Foram/ostracod analysis* (Research Objectives 1, 2, 3, 4, 9, 13)

Ostracods are small shrimp-like crustaceans with a bivalved, calcareous shell (carapace). They can be useful environmental indicators and are particularly sensitive to salinity. Ostracods were studied during the analysis of the sediments from the Dover Bronze Age boat (Robinson 1998). Foraminifera are Protozoans that produce four basic shell types - calcareous, agglutinated, porcelaneous and organic walled - of which all but the last fossilise readily, making them suitable for palaeo-environmental analysis. Forams are almost exclusively restricted to marine habitats and assemblages associated with specific water marks can be used as indicators of sea-level, e.g. high salt marsh or low intertidal mud flats.

Samples will be selected from the bore-holes listed above after completion of the sedimentological work, following a similar sampling strategy to that described for pollen analysis but samples will be targeted at the brackish/marine sediments from approximately 4 metres of stratigraphy at a sampling interval of 10 cm (total 40 samples).

500g samples of sediment will be wet-washed through a 125 micron sieve. If the sample does not break down easily it will be soaked in '10 volume' hydrogen peroxide solution for 24 hours. The retained residue is dried, the ostracods and forams are sorted from the residue using a low-power binocular microscope and then identified.

Initial investigation will target alternative samples (20 cm spacings) to allow refinement of sampling intervals around areas of key interest after the initial investigation. A framework biostratigraphy will be produced after the initial investigation. Spot sampling of key stratigraphic horizons will be targeted following the production of the framework biostratigraphy and the integration of the extant and proposed additional radiometric age estimates.

A report will be produced which will form the basis of the integrated environmental report. JW, 30 days

7.1.6.5 *Mollusc analysis* (Research Objectives 1, 2, 3, 4, 13)

7.1.6.5.1 (Task 38) Sample selection and processing.

The assessment has demonstrated that mollusc shell survives in several strata from the bore-holes. The majority of these assemblages indicate that a complex of freshwater and terrestrial environments existed during sediment accretion. Detailed analysis of shells from these sequences would:
a) Enable reconstruction of the local freshwater and terrestrial environments and how these varied through time
b) Provide information on when and by what mechanism woodland clearance, colluviation and other human induced environmental change occurred
c) Indicate sediment derivation (certain of the assessment samples contained shells from solifluction or loessic sediments).
d) Provide a link with contemporary depositional environments investigated in the boat trench and thereby providing information on the extent of the Dour floodplain in the prehistoric period.

On this basis 10 samples will be selected from the bore-holes listed above, following the production of the framework biostratigraphy and the integration of the radiometric age estimates. Mollusc samples will be taken as 0.10m blocks from selected U4/100 bore-hole cores. The collected sediment is then air dried and disagregated with hydrogen peroxide, before being passed through a 0.5 mm mesh and the residue dried.
KW, 2 days

7.1.6.5.2 (Task 39) The residue is examined and sorted under a low power binocular microscope and shell apices are extracted. Identification is carried out using reference guides and a modern comparative reference collection.
KW, 5 days

7.1.6.5.3 (Task 40) Frequency data are collected and used to plot percentage histograms on which interpretation is based.
KW, 1 day

7.1.6.5.4 (Task 41) A report will be prepared for publication.
KW, 2 days

7.1.6.6 *Integration of specialist palaeo-environmental data* (Research Objects 1, 2, 3, 4, 5, 9, 13)

7.1.6.6.1 (Task 42) Meeting of palaeo-environmental project team following completion of analyses but prior to specialist report production, in order to discuss results and preparation of individual and integrated reports.
KP, HK, MB, NB, 1 day each

7.1.6.6.2 (Task 43) Write integrated environmental report, and circulate to project team.
MB, 10 days

7.1.7 ***Plant Macrofossil analysis*** (Research Objectives 1, 3, 4, 5, 6, 13)

The assessment indicated that there is limited scope for using plant remains from the A20 samples for pre-medieval environmental reconstruction and no further work was recommended. However, medieval alluvium and contemporary archaeological deposits preserved a wide range of charred, waterlogged and mineralised plant remains, which have the potential to provide detailed reconstruction of the town and surrounding environments and plant use from the tenth to fourteenth centuries A.D.

Analysis of charred, waterlogged and mineralised plant remains from the following samples (total 13) is recommended. However, this may be reviewed once all the sample processing has been done if samples with higher potential emerge.
a) Waterlogged remains: Sample 21 from the Crypt, Samples 24 and 25 from Section 57, Samples 4.3-4.5, 4.7-4.9 and 7.4-7.65 from DSC-2 and Sample 7.13-7.2 from TWS-5.
b) Mineralised remains: Sample 340 from Bench Street and Samples 331 and 333 from the Crypt.

c) Charred remains: Samples 255, 221, 222 and 170 from the Crypt.

7.1.7.1 (Task 44) Identification, recording and tabulation of seeds, fruits and vegetative plant remains from the 13 pre-processed samples listed above.
AF, 19.5 days

7.1.7.2 (Task 45) Charcoal analysis of 4 samples.
AF, 8 days

7.1.7.3 (Task 46) Production of a report on all the plant remains.
AF, 8 days

7.1.8 ***Fish bones*** (Research Objectives 1, 3, 5, 6, 13)

Identification, recording, interpretation and report production.
Significant quantities of fish remains still await recovery from the unprocessed samples. Decision as to exactly which samples to study in detail will be made after all the material has been processed (see above, Task 3 and 4.

(Task 47) The fish remains from each of approximately 150 prioritised samples from Bench Street (DS/P), Fishmonger's Lane (DS/I) and the Crypt site (DS/C) will be identified and recorded on a computer database. Recording will be based on methods detailed in Wheeler and Jones (1989). It is anticipated that relatively few bones suitable for biometrical analysis will be present.
RN, 28 days

(Task 48) The remains will be interpreted in terms of a) the fishing industry of medieval Dover, b) the fishing industry in southern England (including East Anglia) during the early medieval period, c) a comparison of the economic status, with regard to fishing, of the inhabitants of the sea-front localities on the east and west of the River Dour and d) the taphonomy of the assemblages.
RN, 5 days

(Task 49) Preparation of report. Comparisons will be made with larger fish assemblage from Townwall Street excavations.
RN, 5 days

7.1.9 ***Animal bones*** (Research Objectives 1, 3, 5, 6, 13)

7.1.9.1 The assessment has shown (Stewart 1999) that the largest and most useful groups of animal bone come the Bench Street region, particularly the DS/C and DS/P sites (Table 10). It is anticipated that more material will be recovered from the as yet unprocessed bulk samples from these areas.

(Task 50) The bone material will be rapidly assessed and a decision as to exactly which groups to study in detail will be made after all the material has been processed (see above).

RB, 1 day
KP, 1 day
BC, 1 day

7.1.9.2 Identification, recording, interpretation and report production.
(Task 51) Material from the selected contexts, including those still awaiting processing, will be recorded and catalogued on a database. Identification of the bones will be facilitated with a comparative osteological reference collection and by reference to a number of manuals. Biometrical data will be recorded following von den Driesch (1976).
RB, 16 days

(Task 52) The remains will be interpreted with regard to the evidence they provide for the local environment and economy, particularly in the Anglo-Saxon and medieval period.
RB, 4 days

(Task 53) Preparation of report. Comparisons will be made with larger animal bone assemblage from Townwall Street excavations.
RB, 3 days

7.1.10 ***Insects*** (Research Objectives 1, 2, 3, 4, 5, 6)
The assessment has indicated that well-preserved insect remains survive in water-logged deposits, particularly those from Fishmonger's Lane. Further work on these deposits is proposed. Particular interest will attach to the evidence provided for the nature of the adjacent human habitation and the estuarine environment.

(Task 54) One kilogram sub-samples will be taken from selected samples and sieved to a minimum mesh size of 0.3 mm. The residue will be boiled in washing soda to disaggregate any remaining sediment and then rinsed onto the 0.3 mm mesh. Paraffin flotation to extract insect remains will then be carried out following the methods of Kenward *et al*. (1980; 1986). The flots will be stored in jars of industrial methylated spirits, and the residues will be bagged wet.
EA, 5 days

(Task 55) The flots will be scanned briefly under a low power binocular microscope to assess whether insect remains are present, their state of preservation, and whether they are present in sufficient quantity to provide interpretable data. Suitable assemblages will be examined on damp filter paper using a low power microscope, identified using modern reference material and keys, and quantified.
EA, 5 days

(Task 56) A report on the findings will be prepared.
EA, 5 days

7.2 ***Publication*** (Research Objectives 1-13)

7.2.1. Final draft text of Report No.2 (Prehistoric and Roman harbour)

7.2.1.1 (Task 57) Final project meeting to discuss integrated palaeo-environmental report, summarising and concluding the project results, prior to preparation of final texts and editing.
KP, HK, MB, 1 day each

7.2.1.2 (Task 58) (Research Objectives 1, 2) Preparation of discussion narrative about the character of the prehistoric and Roman harbour, combining all palaeo-environmental and archaeological data.
GM, 9 days;
KP, 3 days

7.2.1.3 (Task 59) Prepare illustrations for prehistoric and Roman harbour report.
BC, 15 days

7.2.1.4 (Task 60) Edit final prehistoric and Roman harbour report.
KP, MB, 3 days each,
GM, 1 day

7.2.2 Final draft text on Report No. 1 (medieval and post-medieval town)

7.2.2.1 Report Integration (Research Objectives 3-12)
(Task 61) Integration of specialist reports with main texts for medieval and post-medieval report.
KP, 7 days
AR, 3 days

7.2.3 Completion of Reports 1 and 2

7.2.3.1 *Photographic Processing*
(Research Objectives; 5, 6, 7, **8**, 9, 10, 11)
(Task 62) Approximately 25-30 photographs will be required for publication. These will need to be identified, located, processed and printed.
AS, 5 days

7.2.3.2 *Final Editing and Editorial Typing*
(Research Objectives; 1-12)
(Task 63) All reports will be word processed and formatted, and all text copy edited prior to submission to the printer or appropriate academic journal.
JE, 30 days

7.2.3.4
(Research Objectives; 1-2)
(Task 64) The completed text of Report 2 will be submitted to the academic journal selected; any amendments required by journal editor will be made.
KP, 3 days

7.2.4 *Preparation of Archive*
(Research Objectives; 1-**13**)
(Task 65) All material will be prepared for long-term storage at Dover Museum. This will involve placing all records into storage facilities, such as plan stores, storage cupboards, etc.; producing lists and indices both to the project records and the artefacts; and physical delivery of the archive to Dover.
BC, 5 days
KP, 5 days
LH, 5 days
MB, 5 days

7.3 ***Project Management***
Keith Parfitt, the project co-ordinator, will be responsible for facilitating consultation and data exchange between different strands of the project, and monitoring the progress of the palaeo-environmental team. This will be achieved not only by regular monitoring visits, but also by editing and disseminating the interim results. He will be assisted in this task on technical matters by a management assistant, Dr Helen Keeley. The wide range of technical specialists involved in the palaeo-environmental studies will involve close management and co-ordination to ensure integration of work.
KP, 20 Days
HK, 20 Days
PC, 10 days (quality control)

8) Resources and Programming

8.1 ***Project Management Structure and Responsibilities***

The project will be managed by Keith Parfitt of CAT. Helen Keeley of Environmental Archaeology Consultancy Services will act as assistant Project Manager, dealing specifically with the environmental contributions. Andrew Richardson of C.A.T. will serve as Finds Specialist Co-ordinator and Peter Clark as Quality Control officer.

8.2 ***Project team***

The publication reports proposed will require (with some overlap) separate groups of specialists, working under the project managers.

8.2.1 The preparation of the Townwall Street volume has brought together a specialist team, now quite familiar with the archaeology of medieval and early post-medieval Dover. It is proposed to use this same team again in the production of the A20 medieval/post-medieval volume (Report 1). Report 2 primarily concerned with the prehistoric and Roman haven will, will require input from a different group of specialists, mostly palaeo-environmental scientists. The publication team may be listed as follows:

Management
Keith Parfitt (CAT) Project Manager
Peter Clark (CAT) Quality control
Helen Keeley (External) Assistant Project Manger

*Canterbury Archaeological Trust**
KP, Keith Parfitt Stratigraphic sequence/site narrative
BC, Barry Corke Records collation/Draughtsman (site drawings)
AR, Andrew Richardson Finds Specialist Co-ordinator
PR, Post-Roman pottery analysis
WF, Will Foster Pottery and finds illustration
EA, Dr. Enid Allison Insect remains
LH, Louise Harrison Finds cataloguing
JE, Jane Elder Editing of final texts
AS, Andrew Savage Artefact photography

External Specialists
Pottery Research
LB, Ms L. Blackmore, Museum of London
DB, D. Brown, Southampton Museums

Clay Tobacco Pipes
DH, David Higgins

Timber Illustration
CC, Caroline Caldwell

Roman Harbour consultant
GM, Gus Milne

Stratigraphy/Environmental overview/Sedimentology
MB, Dr. Martin Bates, Bryn Awelon, Dihewyd Road, Ciliau Aeron, Ceredigion SA48 7SE. Work tel: 01570 422351 ext. 408; home tel: 01570 471015.

Molluscan analysis
KW, Dr. Keith Wilkinson, King Alfred's University College, Winchester, Hants SO22 4NR. Tel: 01962 827444.

Pollen analysis
JL, Professor John Lowe & NB, Dr. Nick Branch, Archaeoscape Consulting, Dept. of Geography,
Royal Holloway, University of London, Egham, Surrey, TW20 0EX. Tel: 01784 443645/443565. Fax: 01784 472836.

Animal Bones
RB, Robin Bendrey, 4 Roper Road, Teynham, Kent ME9 9DX. Tel: 01795 521353.

Fish Bones
RN, Dr Rebecca Nicholson, Dept. of Archaeological Sciences, University of Bradford, West Yorks,
BD7 1DP. Tel: 01274 233531/2. Fax: 01274 235190.

Plant macrofossils
AF, Dr Andy Fairbairn, 45 Riverside Avenue, Guideport, Choppington, Northumberland NE62 5PP.
Tel: 01670 829375.

Foraminifera/Ostracods
JW, Dr. John Whittaker, Natural History Museum, South Kensington, London SW7.

8.3 Accommodation and Facilities
Analysis of the A20 material and preparation of the reports will be undertaken in several places. The main site texts and illustrations will be prepared at the C.A.T. Dover office (rented from Dover Harbour Board). In-house finds studies, illustration and editorial work will be undertaken at the main C.A.T. building at Broad Street, Canterbury. Outside specialists used will provide their own accommodation.

8.4 Health and Safety Statement
All work will be carried out according to the guidelines specified by the Canterbury Archaeological Trust Health and Safety Policy Document (copy available upon request). It is the intention of C.A.T. to ensure that its work will be carried out in accordance with the relevant statuary provisions.

Management and supervisory staff have a responsibility for implementing this Policy. All employees and sub-contractors are expected to adhere to the Policy to ensure that their own work is carried out without risk to themselves or others.

8.5 Timetable and Gantt Chart

It is proposed that the project will last a minimum of 38 weeks. The Gantt Chart shows the earliest possible start dates and some tasks may need to be extended to take account of external factors and other commitments of various team members.

8.6 Costs

C.A.T. Staff rates:
KP £x/day
BC £x/day
AR £x/day
PC £x/day
PR £x/day
WF £x/day
EA £x/day
LH £x/day
JE £x/day
AS £x/day

Specialists Day rates:
HK £x/day
MB £x/day
JL, NB £x/day
JW £x/day
KW £x/day
RN £x/day
RB £x/day
AF £x/day
CC £x/day
DH £x/day
GM £x/day
LB £x/day
DB £x/day

Other costs

a) Travelling and Accommodation

b) Materials and Transport

c) Publication printing costs

d) *Project Management*

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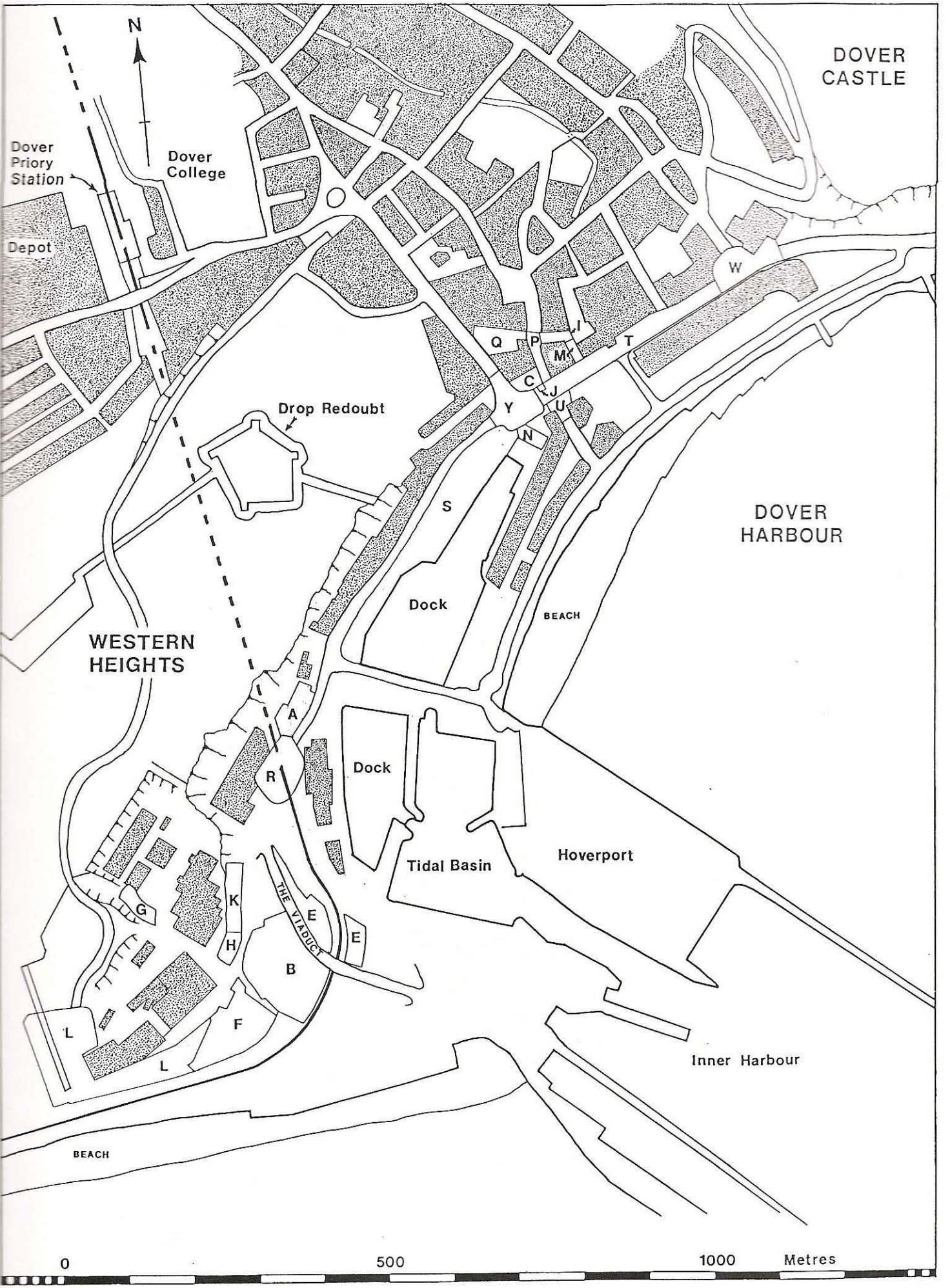

Fig. 1 Map of Dover showing investigated A20 sites.

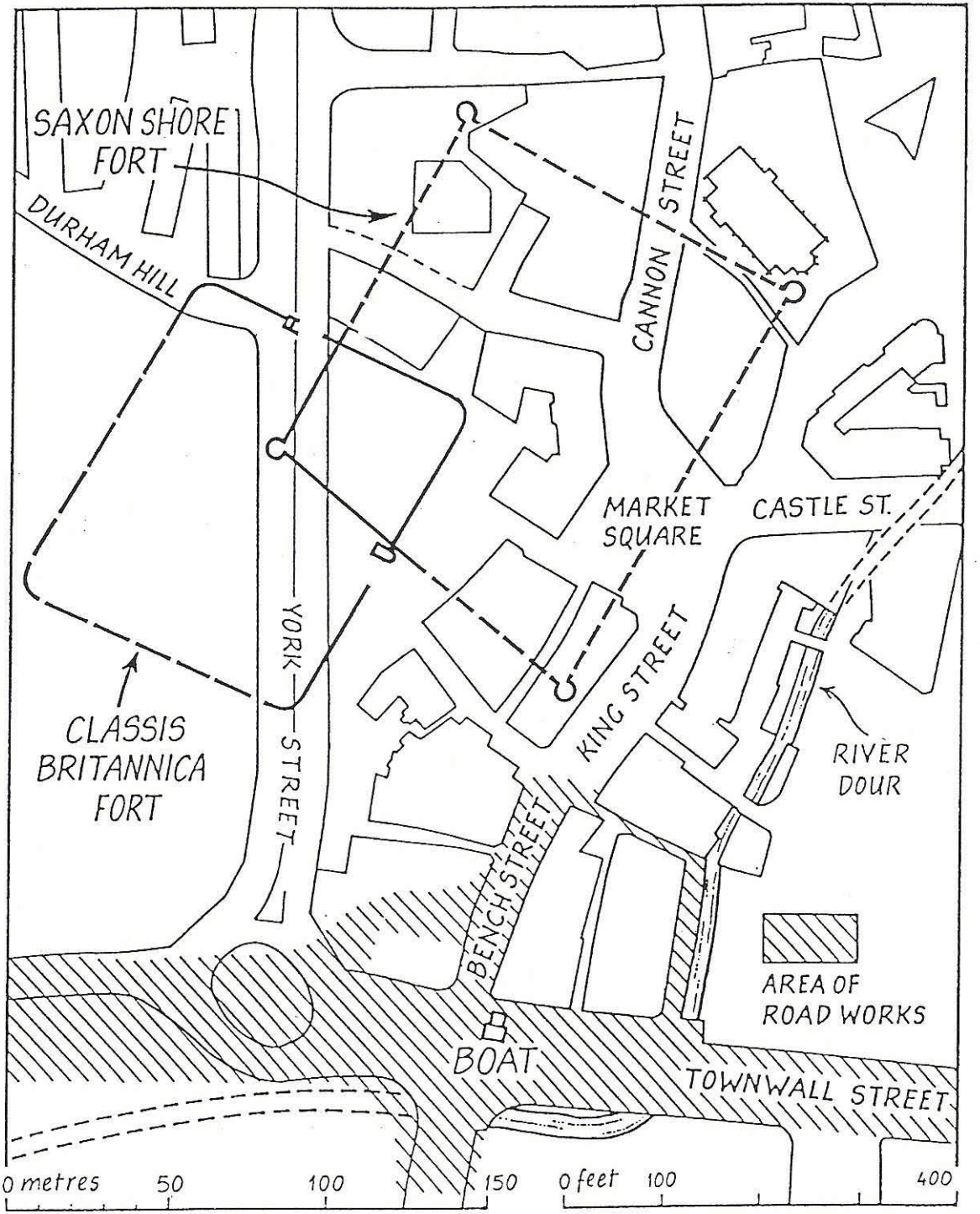

Fig. 2 Detailed map of the Bench Street region showing areas affected by road building and sewer trenching.

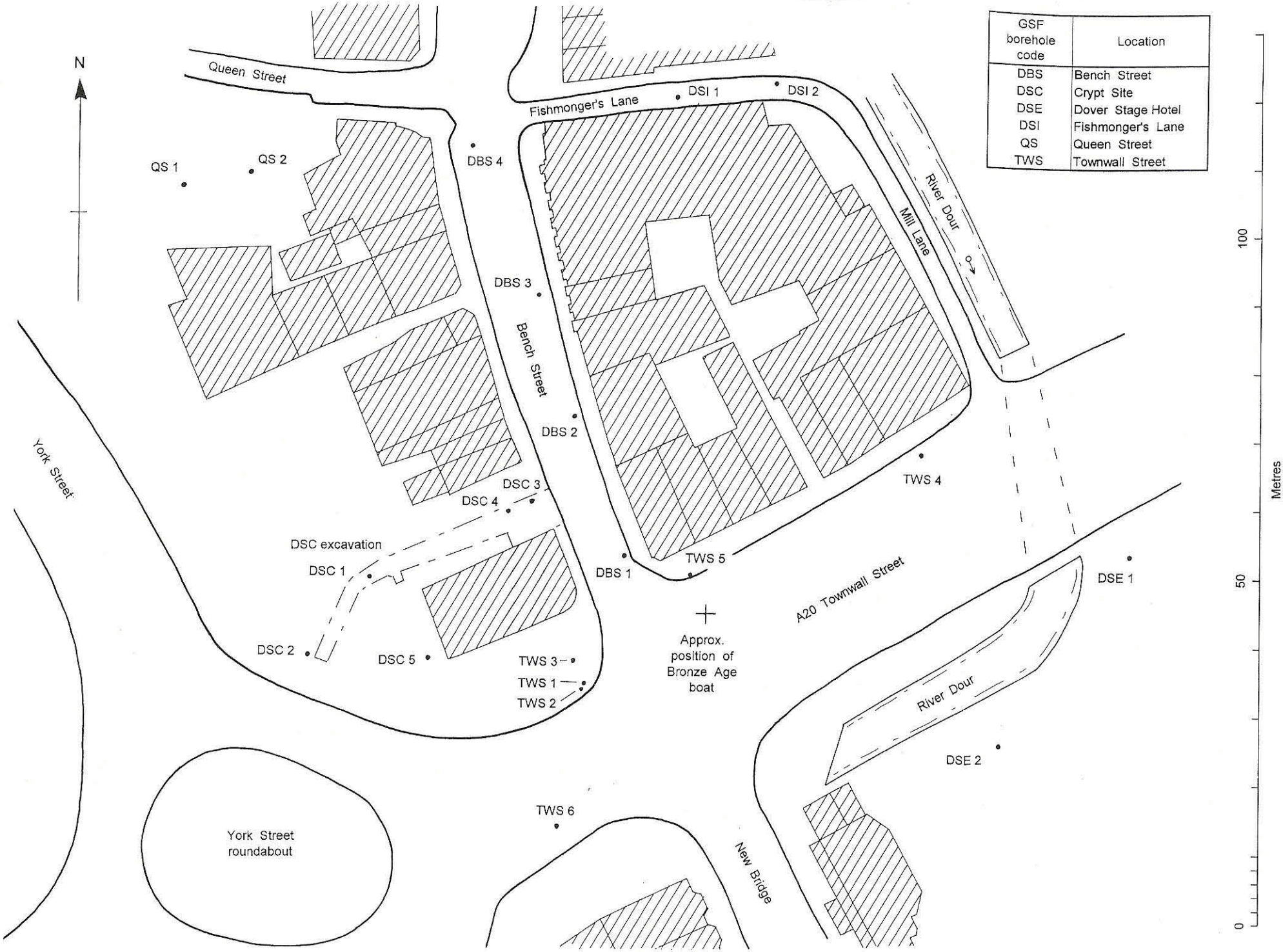

Fig. 3 Map showing position of bore-holes drilled during the A20 project.

Fig. 4 Taking core samples at the end Bench Street.

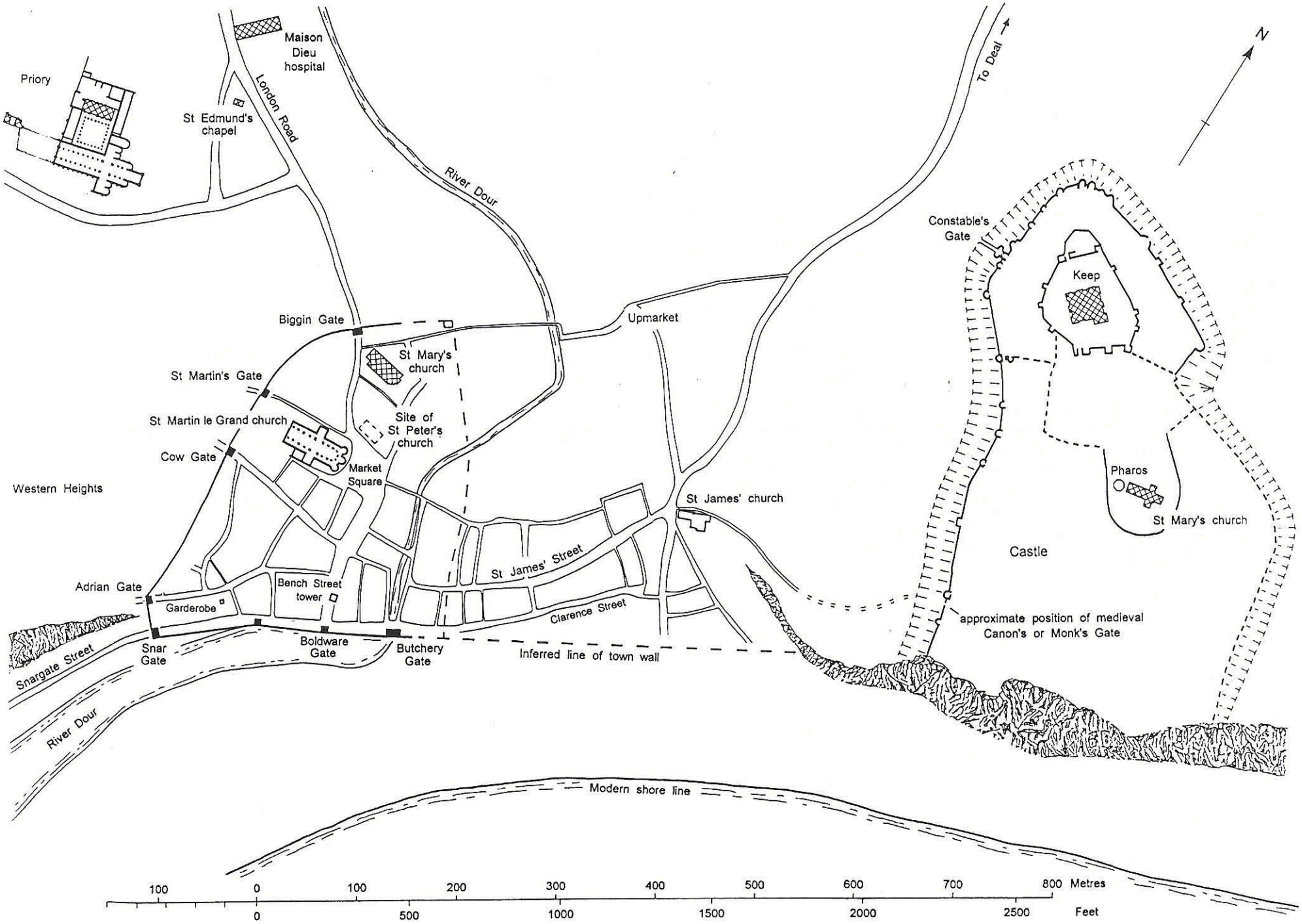

Fig. 5 Map of medieval Dover.

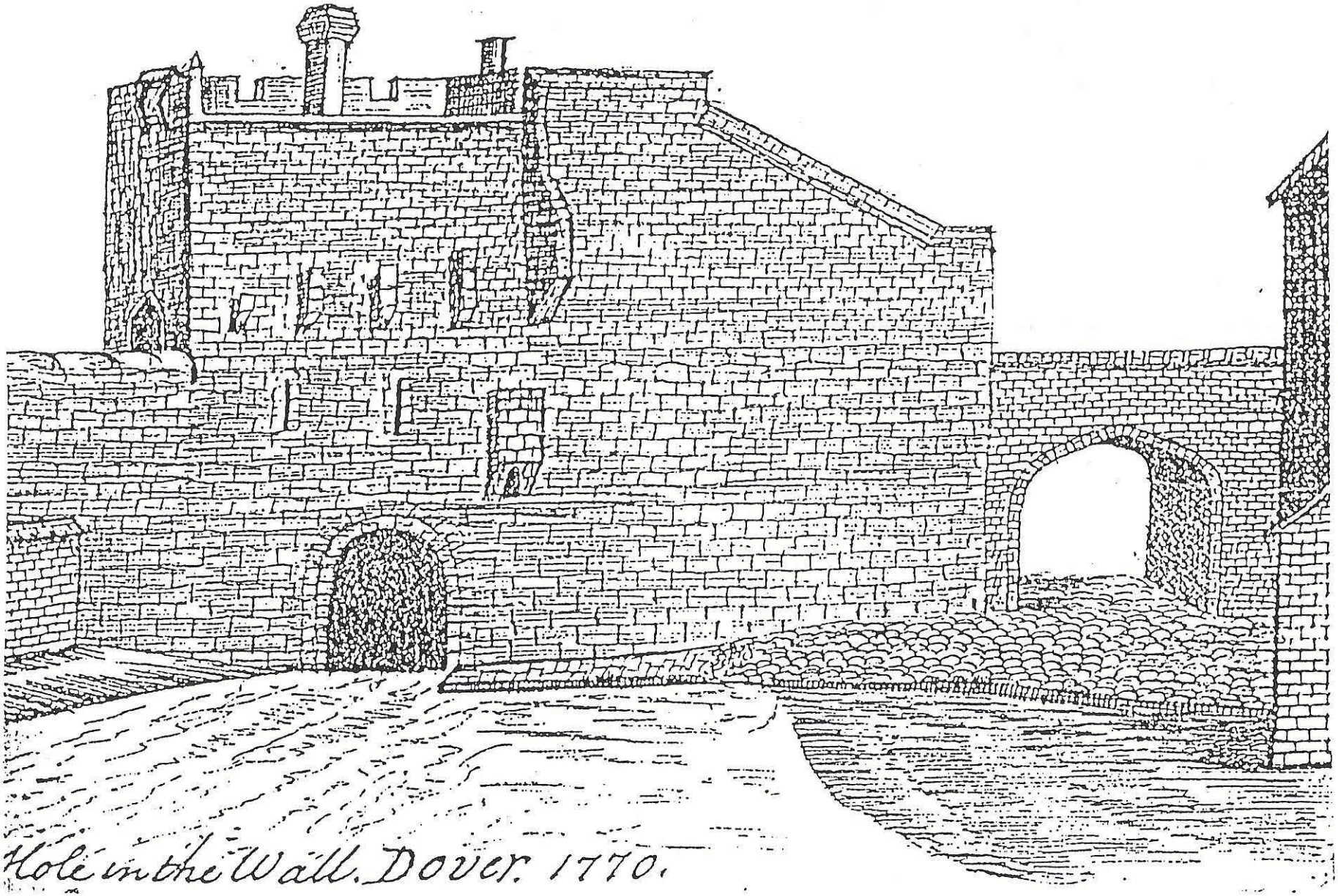

Fig. 6 The Butchery Gate (Hole in the Wall) in 1770; DS/T (from Pattenden's Diary, Dover Museum).

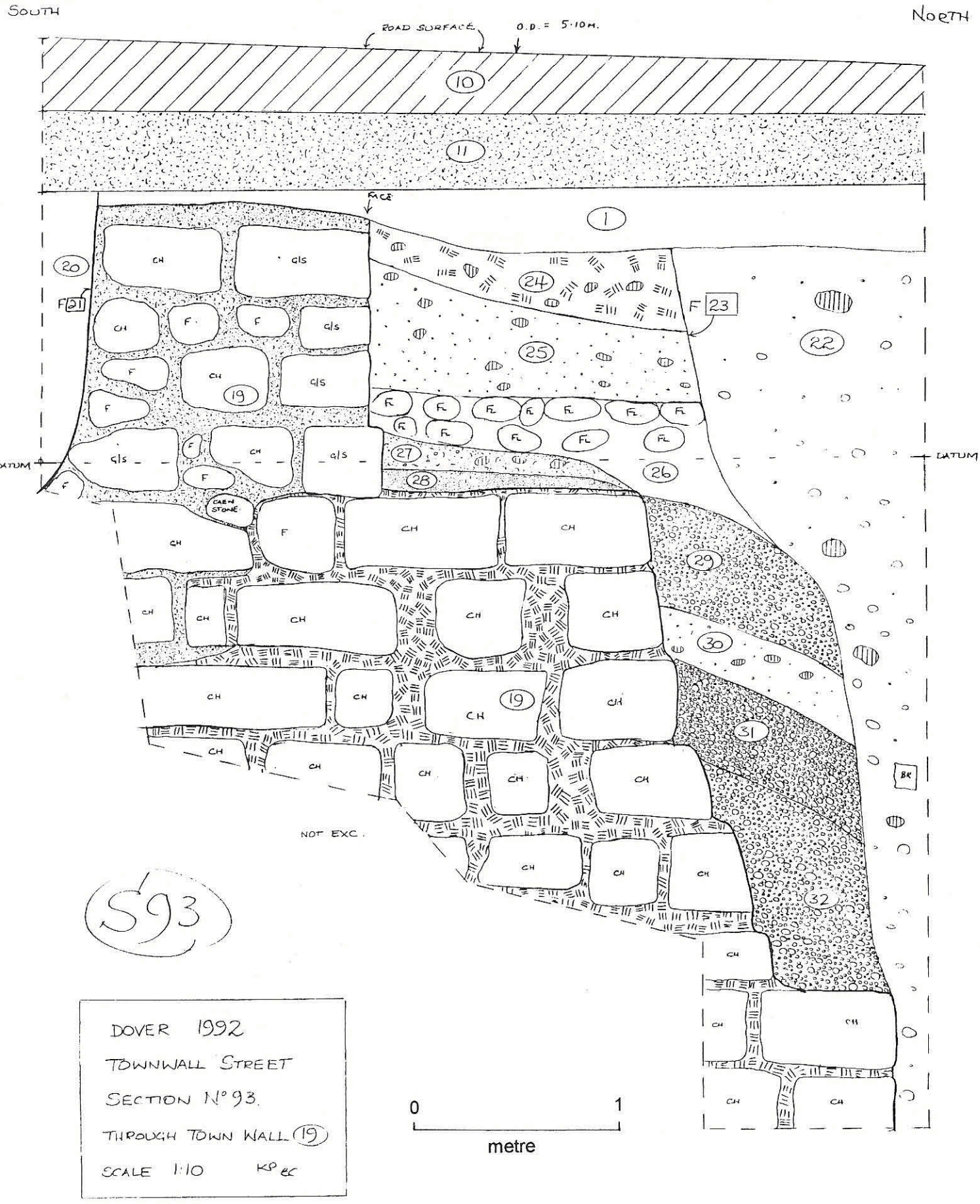

Fig. 7 Section (1992) through town wall, west of River Dour (DS/T; CAT Field Section No.93).

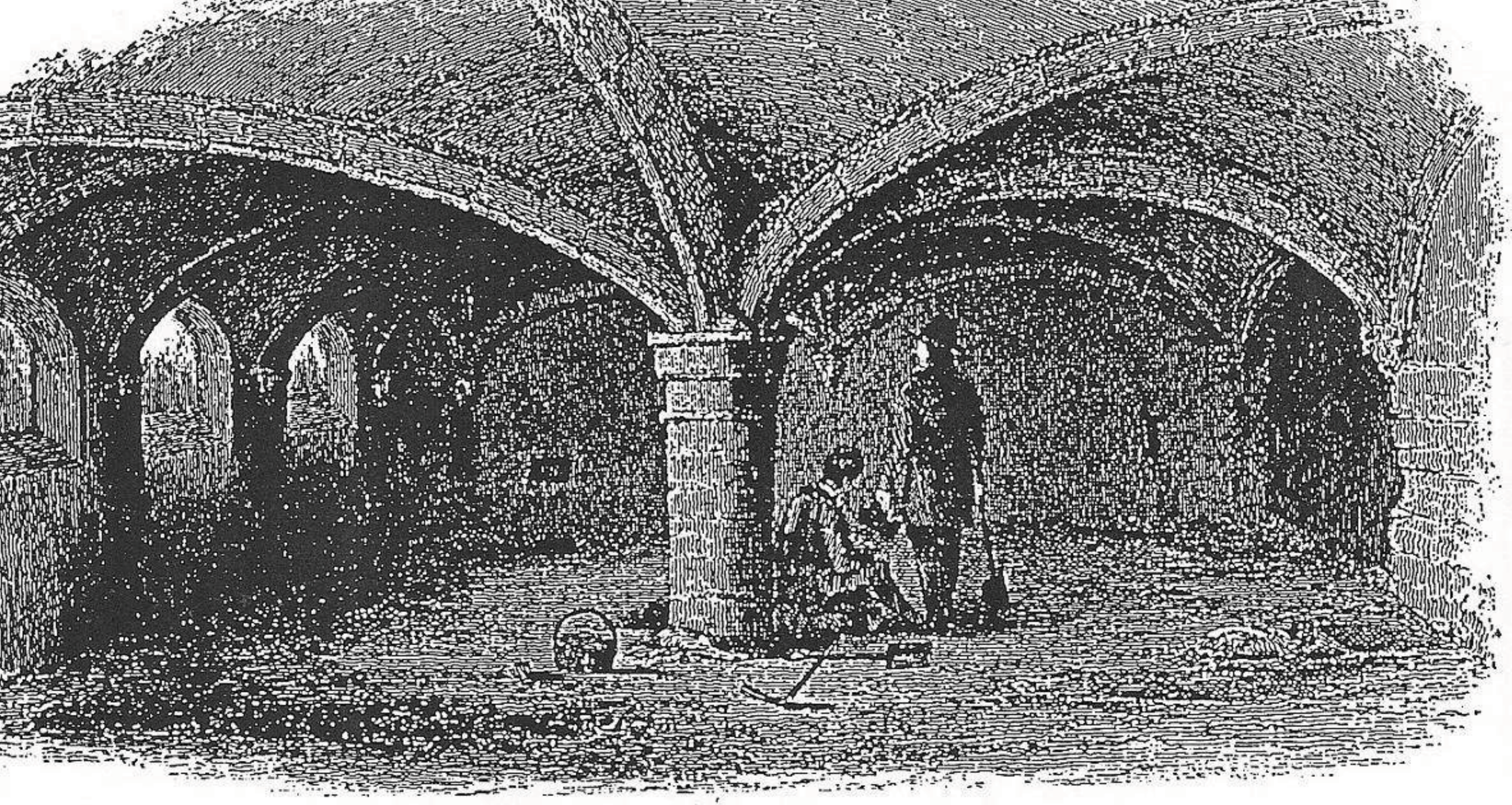

Fig. 8 Medieval cellar revealed in Bench Street in 1836; DS/P (Dover Museum Collection).

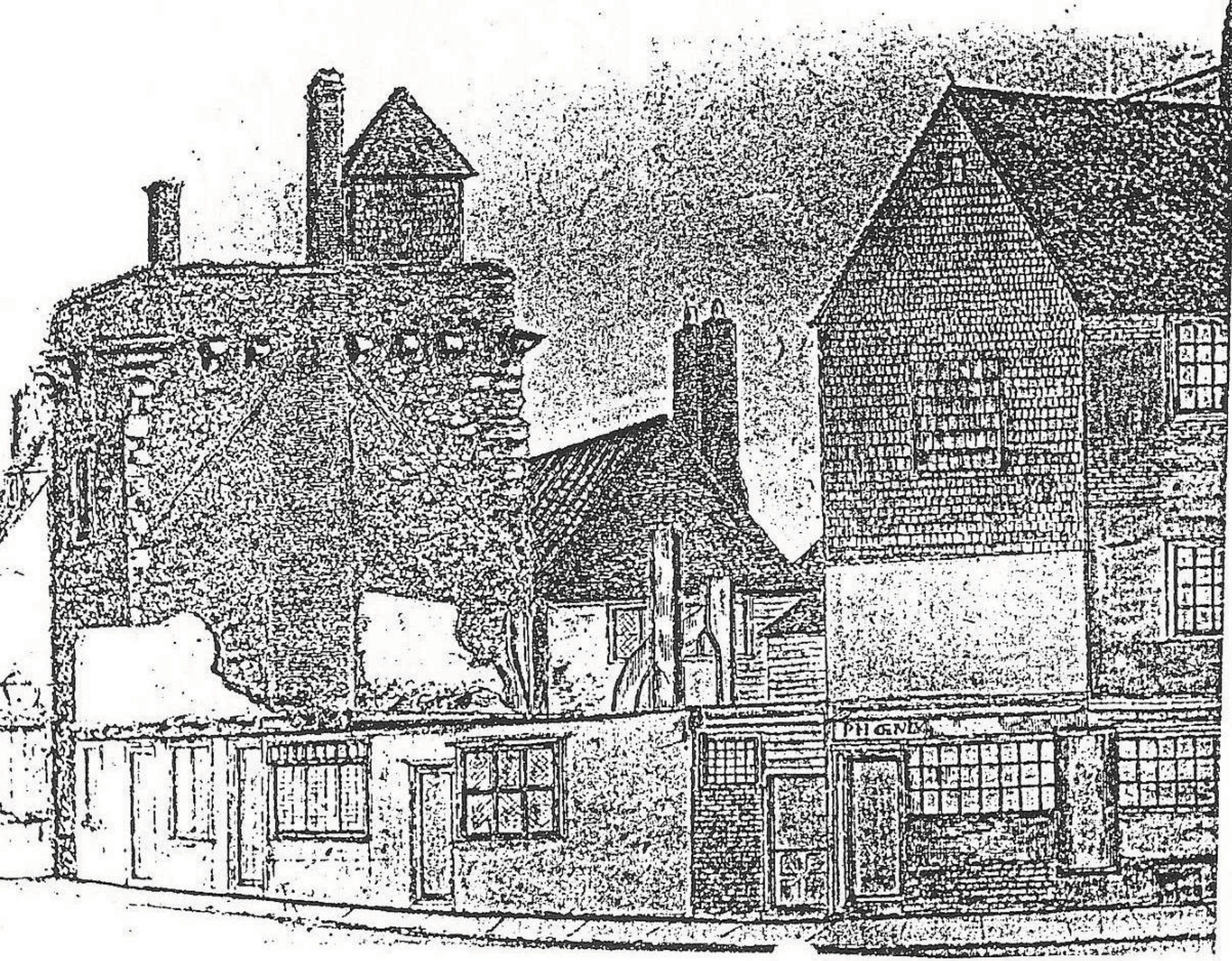

Fig. 9 Medieval defensive tower in Bench Street, 1836; DS/P (Dover Museum Collection).