Dublin's waterfront at Wood Quay: 900-1317

P F Wallace

Excavations have been conducted by the National Museum of Ireland in the old city of Dublin since 1962 (NM1 1973; Ó Ríordáin 1973). While the previous excavations have shed considerable light on the dwelling places and the industrial sectors into which the early medieval town may have been divided as well as revealing considerable information on contemporary crafts and art, the current waterfront excavations at the 1.6ha Wood Quay site (Fig 106) have provided new data on the development of the port, the earliest defences, and the date of the earliest stone wall, in addition to detailed topographical information. The excavations also uncovered evidence for early shipping, shipbuilding, and carpentry in addition to the quays. Unevenly documented details, such as the impact of Norman trade before the AD 1169 Anglo-Norman invasion, the differences between the material cultures of the Vikings and the Anglo-Normans, the Influence of native Celtic material culture on that of the Vikings, and the continuity of urban property boundaries from the 10th to the 13th centuries have all been assisted by the recent discoveries.

Nine stages (Fig 107) by which Dublin's medieval waterfront was advanced into the tidal estuary of the river Liffey between the 10th and 14th centuries have been uncovered since 1974. Earthen banks of the 10th and 11th centuries, a stone wall of about AD 1100, a series of wooden quay revetments of the 13th, and an early 14th century(?) stone quay wall have been unearthed (Wallace 1976; Wallace 1979; Wallace, forthcoming). The site is bisected roughly from east to west by a stone wall, built around AD 1100, which delimits the pre-Norman town. Since 1977 the excavation programme has concentrated on the pre-Norman (10th–12th centuries) area south of this wall, while the 1974–76 programme dealt with the area north of the wall which was reclaimed during the expansion of the port in the 13th century, when Ireland and especially Dublin shared in the great expansion of European trade and commerce.

The massive extent of the gradual encroachment on the Liffey in the Middle Ages becomes obvious if the hypothetical line of the original shore is compared with that of the late medieval quays. An indication of the line of the ancient shore is provided by the number of borings and observations made by the Geological Survey of Ireland between 1903 and 1915 (Camplugh *et al* 1903, 88–91; Haughton 1945, 55), when a wide spread of river alluvium was found to overlie a large area of the Boulder Clay on which Dublin is built. This indicated that the Liffey was originally much broader than it is now. Recent excavations have confirmed the position of the alluvium along Wood Quay and the importance of the medieval high-water line in relation to the siting of flood banks and the earliest defensive embankment.

Whilst the Liffey was wide and tidal, it was also fairly shallow; the shallowness seems to be the main reason for 13th century attempts to increase the draught of water for the increased size of contemporary ships. This problem was to continue even after the 17th century when the active port and docks area had moved eastwards in search of deeper water in the direction of the mouth of the river. The river was also fast-flowing and subject to flash floods

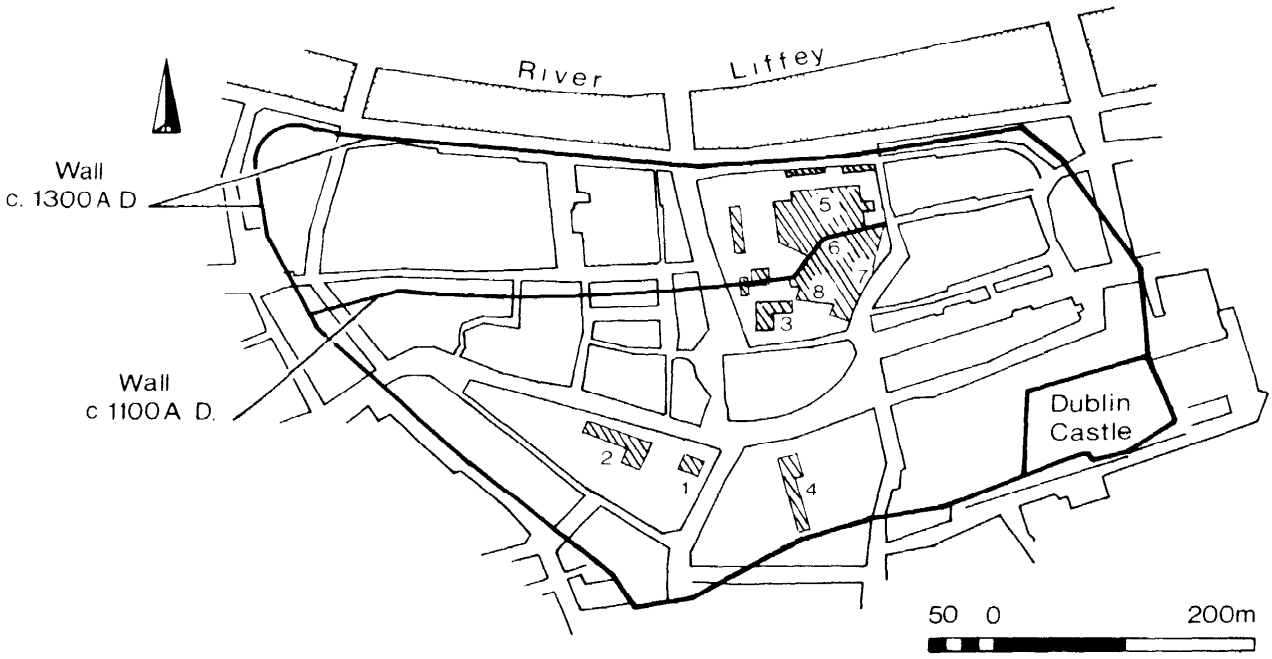

Fig 106 *Old City of Dublin showing line of stone walls, extent of original littoral, and sites of excavations.* 1 *High Street I, 1962-3;* 2 *High Street II, 1967-72;* 3 *Winetavern Street, 1969-73;* 4 *Christchurch Place, 1972-5;* 6 *Fishamble Street I, 1975-6 (all directed by B ò Riordan);* 5 *Wood Quay, 1974-6;* 7 *Fishamble Street II, 1975-;* 8 *St John's Lane, 1978-(all directed by P F Wallace)*

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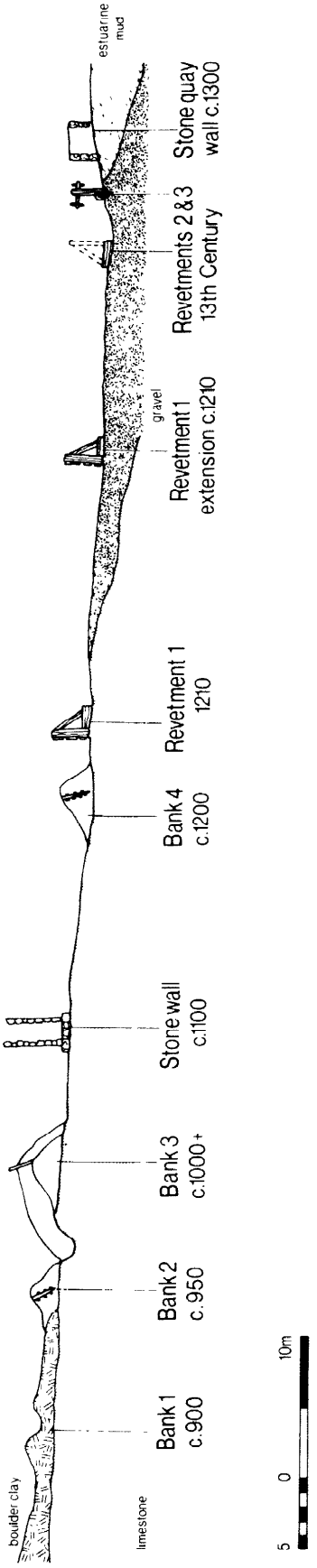

Fig 107 Dublin's medieval waterfront at Wood Quay: schematic cross-section to show positions of waterfronts from 10th to early 14th century

(Semple 1776), as is suggested by its original name in Irish, *Ruirteach* (Little 1952; Clarke H B 1977, 32) which means 'tempestuous', *Laoife* or Liffey (Byrne 1973, 150) then being applied to the plain west of Dublin through which the river flowed to the sea.

History records the earliest Viking foundation at Dublin as the AD 841 *longphort* or ship fortress, but no definite trace of this has come to light in the course of the excavations. It was built on the high spur of ground overlooking the river where the city was to develop and expand in the 10th and 11th centuries. The *longphort* was probably built at the confluence of the Liffey and its southern tributary, the Poddle, just east of the present Wood Quay site. While there is as yet no archaeological evidence for a pre-Viking township at Dublin, scholars have recently looked afresh at historical references (Little 1952) and topographical indications (Clarke HB 1977) which seem to suggest the existence of a monastic foundation of quasi-urban character. Even if such monastic establishments are accepted as proto-towns (Delaney 1977, 48-9), it is generally agreed that the Vikings were responsible for the establishment of the first real Irish towns (Butlin 1977, 11 -27) as Ireland was brought firmly into the mainstream of a north European commerce based largely on trade routes pioneered by the Scandinavians.

The earliest waterfront, AD 900- 1169

Bank 1

Recent work at Wood Quay has shown that low flood bank(s) were scarped out of boulder clay above the high-water line, probably in the early 10th century. These were not more than lm high and do not appear to have been topped with palisades. It is not clear yet if there is more than one of these banks or if they are concentric. It seems that they were primarily intended to keep the Viking properties on the slope above the foreshore dry. TWO skeletons, one male and one female and both orientated east-west, were found buried in the Boulder Clay at this level.

Bank 2

Sometime later, probably about AD 950, an extensive embankment was erected along the high-water line of the shore. Although conceived as a unit, it seems to have been built in a number of sections. This bank was partially built on top of dumped organic refuse including animal bones, discarded carcases, layers of sewage and moss, and was stabilized at its core by a post-and-wattle boundary fence against which was heaped the earth and gravel of which the bank was built. It appears to have been bonded in estuarine mud and was placed on the rising ground of the river bank, making its external aspect much higher than its internal. It would seem that the bank was started at the east of the site towards Fishamble Street and in the direction of the original *longphort*, where it was protected from the erosive action of the tidal river by a post-and-wattle breakwater secured in a channel cut into the rocky foreshore. A cobbled stone pathway may have existed just inside and parallel to the bank along this eastern section. A deep ditch *c* 1.60m in depth and *c* 2m in width was cut into the natural limestone bedrock immediately outside the central section of this bank. This can hardly have been defensive and may

Fig 108 Wood Quay, Dublin: mortised boards which originallyfronted the 10th century Bank 2 reused in the 11th century Bank 3

have been intended to retain water at low tides to facilitate docking ships. A boarded slipway(?) comprised of wide ashen boards set edge-to-edge on the outer slope of part of this bank, to which they were originally pegged through square mortises in their broad faces, may have facilitated the beaching or launching of boats (Fig 108). The most western part of this embankment was constructed on the higher-rising Boulder Clay well above the water line. The total extent of this structure is not known, as it extends beyond the confines of the excavation. The fact that the bank appears to follow higher ground at the west of the site where it appears to turn south-westwards suggests that this feature may not have been solely connected with the waterfront but may have encircled the early township, fulfilling an enclosing defensive function as well as the docking facility it seems to afford along part of the shore. The bank was built from east to west, encompassing exposed bedrock, natural sands and gravels, and Boulder Clay as it progressed westwards across the site.

Bank 3

Probably about AD 1000, a more substantial embankment built in at least four different stages was erected outside or farther out in the bed of the Liffey than that just described. The breakwater basketry of the early bank was partly used to retain the later bank, which was also protected by a post-and-wattle breakwater. Gravel, stones, and earth were used in the construction of this bank, which was reinforced by discarded post-and-wattle screens and by bundles of brushwood. Some of the boards which faced the outer slope of Bank 2 were turned over and used to stabilize the redeposited estuarine mud which forms part of Bank 3, showing the shortness of the time which elapsed between the final use of one bank and the erection of its replacement. This bank also had a series of long poles laid at right-angles to its long axis. These were either for reinforcing and bonding the loose ingredients of which it was comprised or, more likely, used to support palisades or fences. A post-and-

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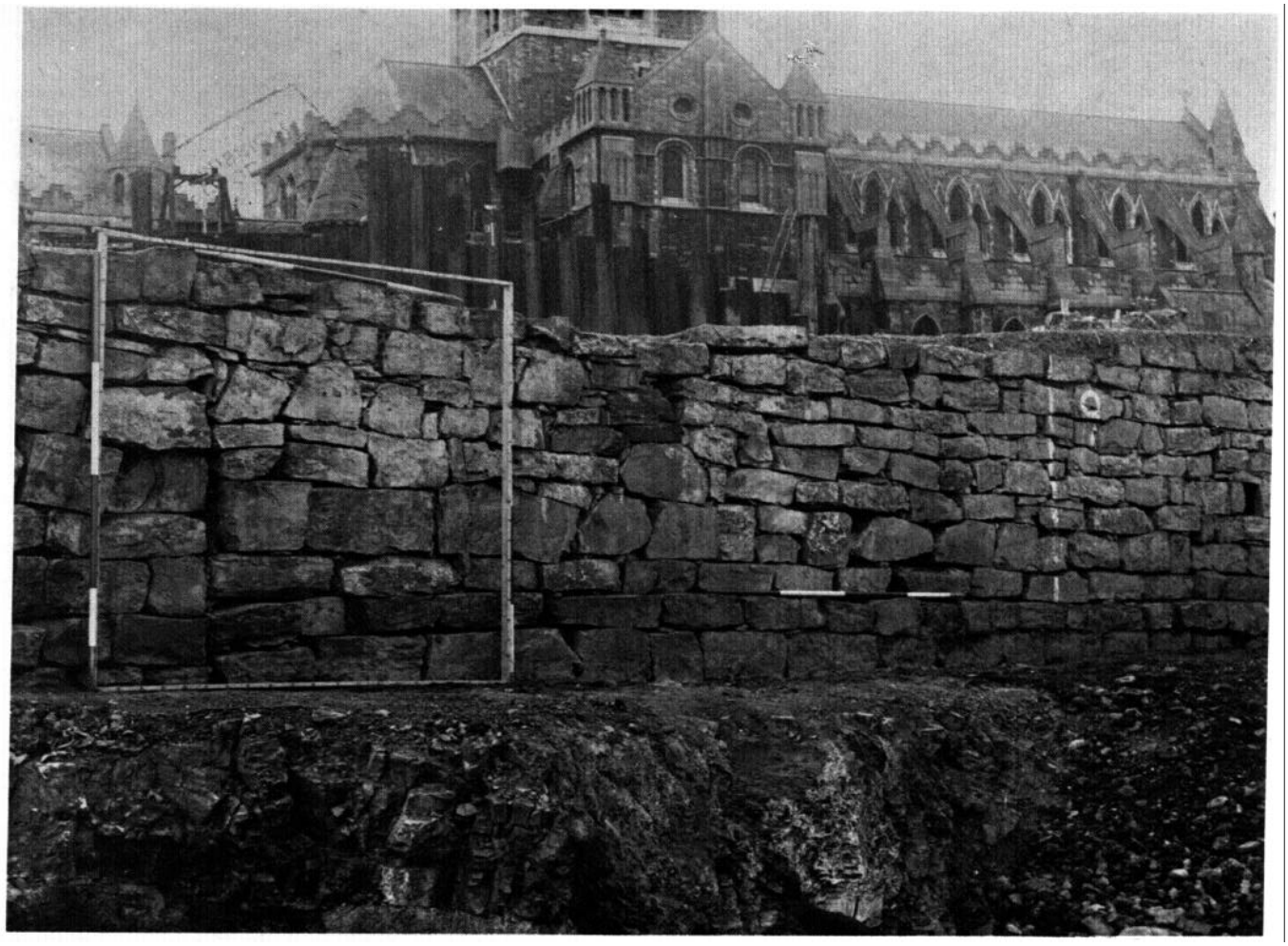

Fig 109 *Wood Quay, Dublin: stone wall c 1100, with Christchurch Cathedral to north*

wattle fence which crowned it was found, as was a later stave palisade which was anchored or tied from the inside. The bank was revetted on the riverward side by boards driven into the ground and, in another place, by a post-and-wattle revetment. A wattle revetment connected with one of its structural phases was bedded in a channel cut into bedrock, the stones of which had been backfilled and tamped around the upright posts. In its final phase this bank was covered over with estuarine mud brought from the bed of the river. This dried out and formed a hard and firm surface. Like Bank 2 which it replaced and in its final stages incorporated, Bank 3 extended beyond the limits of excavation and seems not to be confined to the waterfront, but may once have encircled the town, as was suggested in the case of its predecessor. It may have been more substantial at the landward side of the *enceinte.*

Whilst Scandinavian fortifications in Britain and Ireland have been discussed recently (Talbot 1974, 37-45; Dyer 1972, 222-36), there would appear to be few excavated parallels for the waterfront embankments at Wood Quay. Although there is a general similarity between the Viking fortifications at Dublin and the more massive structures at the great Scandinavian trading centres of Birka and Haithabu (Almgren 1966, 32-64), and an even closer relationship in structural detail between the vertical boards on the slope of the 10th century embankment at Wood Quay and the pinned horizontal planks on the inner faces of the Kanehave Canal (Wilson 1978, fig 4), the banks at Dublin appear to be far more closely paralleled at Hungate, York, where Anglo-Danish ramparts of roughly similar height and construction have been discovered (Richardson 1959, 5l-114). The erection of a bank 'to complement the natural defences' seems to mirror the experience at Dublin, though whether the earliest of the banks at York and Dublin were to prevent flooding (Hall 1978, 33) or to act as a military defence must remain unanswered. There is little doubt that the earthen bank with its timber palisade near the 'Anglian Tower' *(Medieval Archaeol,* **16,** 165-7) is defensive and similar to Bank 3 at Wood Quay.

An English rather than a Scandinavian inspiration for these banks is more acceptable, as it coincides in Ireland with a new wave of Viking colonization in the early 10th century which came not from Scandinavia but from Britain (Sawyer 1970, 89). The fact that the early 10th century was also a period of intense contact between Dublin and York

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(Smyth 1975) adds further weight to York as the probable source of this influence. That the height and composition of the banks at Wood Quay resembles that of the average Irish rath and monastic enclosure may mean that the Dublin banks were a foreign idea executed at a local scale to meet the demands of local warfare. This also made it possible for the Irish to take Dublin about ten times in the period 840- 1169 (Smyth 1977, 185)!

Earliest wall, c AD 1100

The next advance into the Liffey is represented by a stone wall *c* 1.50m wide and possibly about 3.50m in original height (though its present surviving height averages *c* 2m) (Fig 109). It runs roughly parallel to and about 5-10m north of Bank 3. It runs east-west for 61 m from the east margin of the site at Fishamble Street, turns sharply north-east/south-west for 22m, resumes its east-west line for another 23m, and extends beyond the west margin of the site at Winetavern Street. The change in orientation may reflect the change from the limestone outcrop to less stable gravel, or the existence of a pool in the Liffey estuary at its confluence with its northern tributary (the Bradogue) or a desire on the part of the builders to follow the line of the earthen banks, the positions of which may themselves have been determined by a combination of similar natural conditions. The wall comprised a rubble till within mortared stone facings, although the mortar on the outer face was probably eroded by the tidal estuarine waters. It was partly built on a dry stone plinth or base, to the south of which have been found mortar platforms where the mortar for the upper courses was mixed. There are a number of divisions in the wall on its inner face, indicating that the outer face was built first and the wall completed on the inside. There is also evidence that the wall was repaired in the 13th century. Organic refuse was dumped inside the wall to stabilize it from the pressure of the river and a deposit of estuarine mud was placed on top to reinforce this layer. This suggests that the ground surface behind the wall was much higher than that to the north (like the earlier embankments), and so if the wall was not free-standing it may have been a revetment or a quay wall. However, the surviving maximum height of the wall at the west of the site suggests that it was a defensive structure. It was built *c* AD 1100 and, like the earlier banks, was extended right around the city. It has been suggested that the reasons why the Normans were so desirous of capturing the Viking towns was that they were walled fortresses and seaports from which they could maintain contacts with their home bases (de Paor 1976, 36).

South of the wall and the embankments work has concentrated on 11th and 12th century houses and on the boundary fences between which they were situated. As is known from the earlier National Museum excavations in Dublin, the houses tend to be of rectangular plan and to average *c* 7m x 4m. They have hearths at the centre and a bedding of brushwood along the side walls. In *c* 3m of layered organic habitation remains which survive, boundary fences replaced one another in exactly similar positions, showing a continuity of and respect for boundaries in l0th-12th century Dublin. The property boundaries are trapezoidal in shape and unequal in area and appear to have their narrowest end fronting on the quayside, from which they widen as the approach the rising ground at the south-east of the site. It is hoped that the present excavations will establish the original early 10th century layout of these boundary fences and houses along the Fishamble Street side of the site and the relationship of these property boundaries to the first waterfront embankments, and indicate the extent to which the topography of this part of the city was determined by the position of the banks.

A number of 10th and 11th century ships' timbers, some of which were reused as a foundation for a pathway, have been found as well as a wide range of domestic articles and ornaments of the same period. While the slave trade appears to have been the 'key factor in the economic life' of Scandinavian Dublin in the late 9th and 10th centuries, when Saxo Grammaticus described the city as 'filled with the wealth of barbarians' (Smyth 1977, 166-8), owing to its position on the Atlantic trade routes of the Vikings, there were also other items of trade. Imported steatite, walrus ivory, and great quantities of amber have come from the 11th century levels at Wood Quay, while wheel-stamped Anglo-Saxon pottery of the 11th century and later and early 12th century Stamford, Thetford, Andennes, and French grey wares have also come to light. Coins of the Saxon Kings Eadgar and Athelstan also attest to trade, as does the occasional sherd of Roman samian ware, which may indicate contact with a town in Britain (York?) which was once settled by the Romans. Finds of souterrain ware or native pottery are tangible proof of contact with the native rural population, while objects decorated in 11th century Ringerike ornament show the influence of the wider Scandinavian world.

In the absence of definitive dating, it is unwise to equate the building of the banks or defending of Dublin to the reign of any one of her Scandinavian Kings. Wilson (1976, 110) sees the rise of Dublin's trade as following on the expulsion of Eric Bloodaxe from York in 954, but it could also be said that the erection of the embankments are as likely to date from periods of renewed Scandinavian aggression or military recovery, with the recovery of Dublin in 917 possibly coinciding with the building of Bank 2. Future excavation may discover fortifications ascribable to the return of Ivar and Olafr in 871 and to the *longphort* originally built in 841.

The Anglo-Norman waterfront, AD 1170-1317

The 1974-6 excavations were concentrated on the reclaimed area north of the city wall. The broadness and shallowness of the Liffey appears to have made Dublin inaccessible to the larger ships which had to anchor at a distance from the city. Close approach was made increasingly difficult by the gradual accumulation of silt and the absence of adequate dredging facilities. Excavation at Wood Quay has shown that land was advanced (ie reclaimed) to meet the ships, since they could not approach the land. The need for improved docking facilities in the early 13th century was all the greater since the recently settled Normans actively engaged in a flourishing European trade, which had led to an increase in the size and draught of ships.

Prince John's 1192 Grant of Civic Liberties to Dublin confirms Henry II's 1171 charter and is addressed to citizens 'dwelling both without the walls as within' who were to improve themselves 'in making buildings wherever [they] shall wish upon the water [ie river]' (Curtis & McDowell 1943, 24-6) which implies that land was being

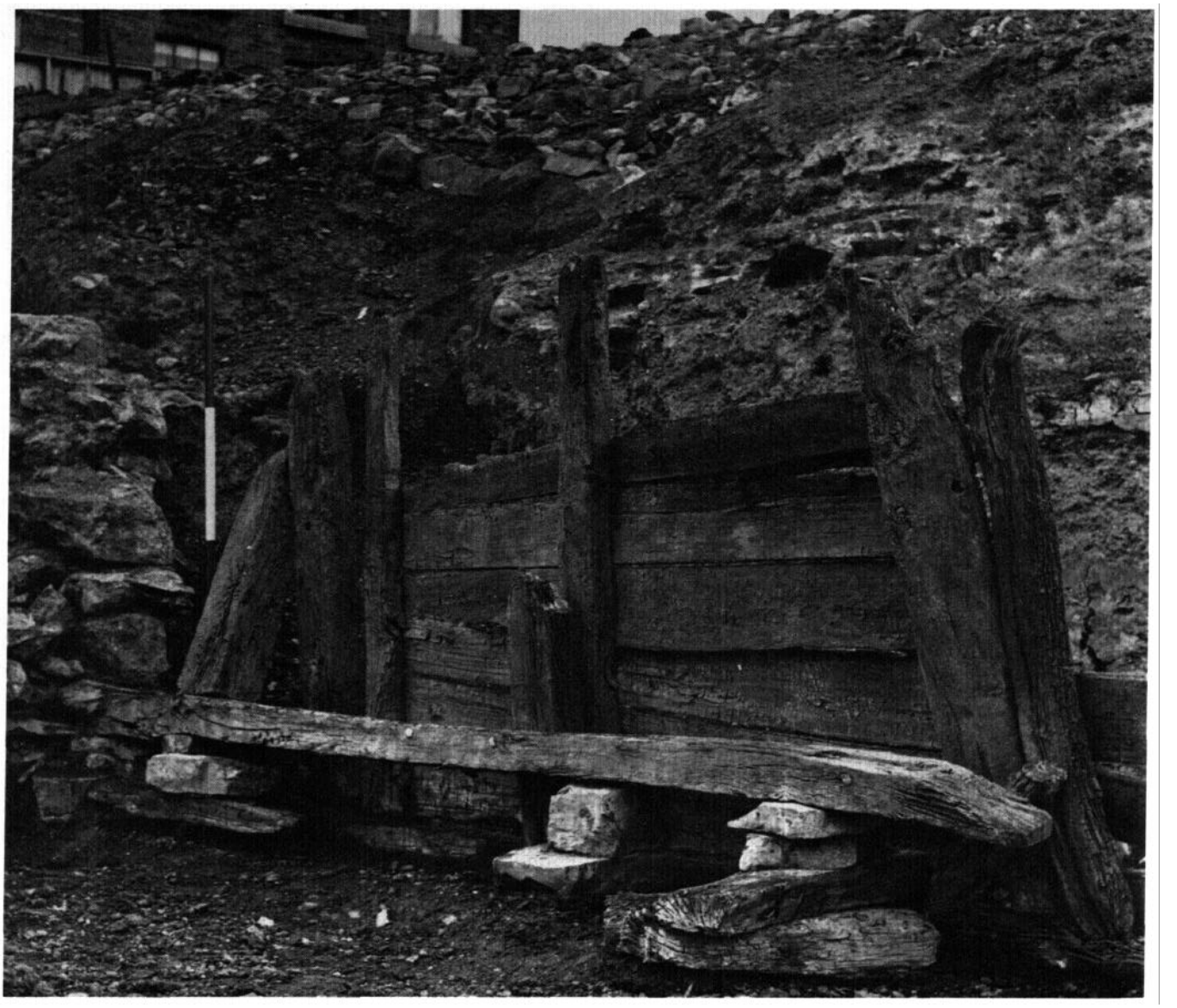

Fig 110 *Wood Quay, Dublin: revetment 1, c 1210: Section A*

reclaimed from the river at this date. A text of a decade later (1202) confirms possessions 'in sands and mudbanks' (McNeill 1950, 29).

Post-invasion embankment (Bank 4)

The earliest advance on the Liffey north of the city wall at Wood Quay seems to have been about or shortly before AD 1200, when a line of post-and-wattle *c* lm high and 35m long was erected on the river gravel roughly parallel to and 25m north of the wall. This line was intended to provide a stabilizing core or retaining fence for an embankment (Bank 4) which was probably meant to increase the draught of water. Its west end was discovered midway across the site, but its eastern end extended beyond the east margin of the site under the present Fishamble Street. This rather flimsy support for Bank 4 collapsed soon after it was erected. It may thus have only been intended as a temporary measure, as a wooden revetment soon replaced it. Six lines of similar nature divided the interval between Bank 4 and the wall into a series of rectangles. These appear to be property boundaries or extensions into the water of the messuages or burgage plots of the type mentioned in the 1192 charter, but may also have facilitated reclamation. In at least three cases these

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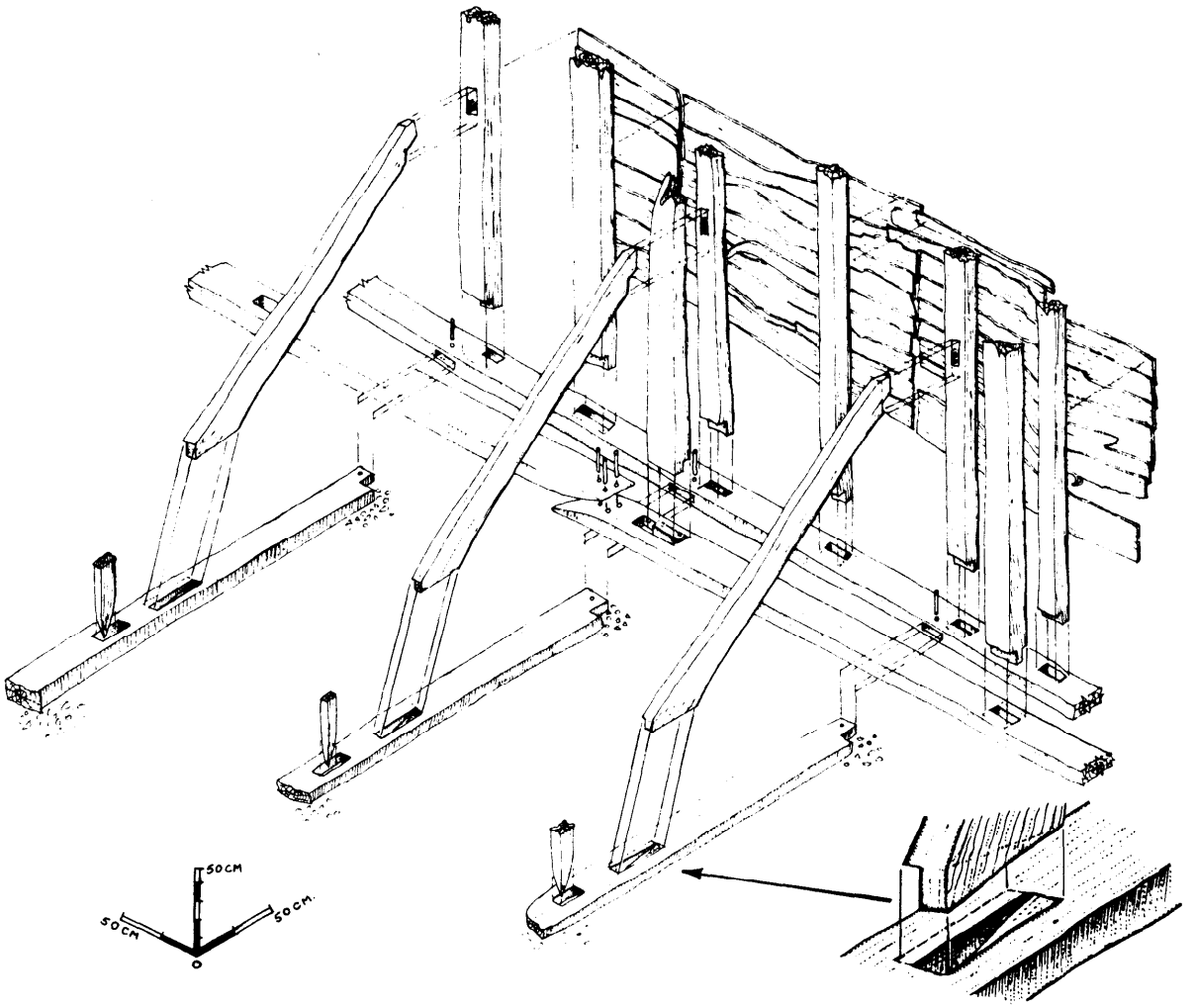

Fig 111 Wood Quay, Dublin: revetment 1, c 1210: Isometric drawing of Section D

north-south fences were overlain by later 13th century sill beams of a warehouse complex, showing a continuity of these property lines.

Early 13th century revetment: revetment 1

In *c* 1210,[1] a stout wooden revetment was built across the site in a fairly straight north-east/south-west line *c* 2-3m (and in one place only 1.5m) on the riverward side of Bank 4. It comprised squared oak posts behind which were placed horizontal planks set on edge and held in place by the pressure of the town refuse heaped behind (Fig 110). The posts were tenoned into footbeams or baseplates and were supported on the front by braces tenoned into subsidiary baseplates fixed at right-angles to the principal baseplates. So far, six distinct units of this revetment have been identified, all conforming to the front-braced 'vertical' tradition of north European wooden quay building. Each of the units measured *c* 12-15m in length and was built as a separate element, although it is clear that they were meant to join up in a continuous line along the waterfront. The units imply either a division of ownership or responsibility or, less likely, of the building contract. That they were built together on a line suggests a civic or municipal control which was not as strongly manifested as in the case of the earlier pre-invasion embankments and the stone wall.

The five sections of the revetment uncovered in the recent excavations have been labelled *A, B, C, D,* and E from east to west. In *B* the principal posts were supplemented by midspans between each pair of principal posts, and auxiliary posts were stubbed into the baseplates near the principals to retain the horizontal boards, which had buckled forward under the pressure of infill material. In *B* the principals were braced, whereas in *D* the midspans were braced (Fig 111). Subsidiary baseplates at right-angles to the main plates were used to retain the tenoned brace heels in *A, C, D,* and *E* but not in *B,* where the heels simply butted into the gravelly foreshore. Most principal posts were just over 1.8m tall. The braceplates were squared oak beams *c* 0.25m x 0.20m up to 4.82m long, and had a simple groove on their upper surfaces to receive the lowermost of the horizontal planks, which were tapped into the main groove via a feeder groove from the edge. The absence of plough planes meant that these grooves were often of uneven thickness and unable to accommodate the equally uneven adzed boards.

In general, no nails were used, as the overlapping boards behind the posts were secured by the pressure exerted by

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the dumped deposits. The radially cut planks were of triangular section and about nine were used per panel in sections *B* and *D*, where they were *c* 2.2m long. The subsidiary baseplates of *A, C, D,* and *E* were tenoned into the northern edges of the principal baseplates. Each subsidiary baseplate had two mortices: an inner to take the raking or supporting braces and an outer to take a peg which secured them to the ground. Posts and wedges were also driven into the ground in front of the principal baseplates to prevent the revetment from slipping riverwards.

A structure consisting of vertical posts and baseplates was placed on top of the subsidiary baseplates across the site. This was not secured to the revetment and was probably meant to act as a 'buffer' to prevent docking ships from colliding with the raking braces of the quay wall. The baseplates of the 'buffer' bear no upper surface groove and their uprights are about 2.70m apart, in contrast to those of the main revetment, which stood at intervals of *c* 1m, suggesting that it was never intended to clad the outer structure. The vertical posts of the 'buffer' were larger than those of the boarded revetment, standing *c* 2.20m high. The revetment's pegged scarf joints face eastwards, indicating that this structure was laid from east to west, in contrast to the 'buffer'.

Detailed study of these timbers has greatly expanded knowledge of Irish medieval carpentry. There appears to have been considerable use of chisels, spoon bits, and augurs but little evidence for sawing. Few nails were used by carpenters, who depended on dowelling and mortising. The muddy conditions of the shore made prefabrication necessary, as is evident from the lengths of the boards and the well-cut chase mortises and tenons in *D*. The number of unpegged mortises may also mean that the tidal estuary and the Liffey's flash floods militated against prolonged periods of sustained work.

Revetment 1: extension

Revetments l's section *C* was either never completed or had been dismantled, as no primary uprights or boards were found with the baseplates, which survived with the overlying 'buffer' phase. This may have been due to a change of mind on the part of the builder or owner of this section of the quay front, as another revetment was erected *c* 20m farther out from section *C* in the bed of the river. This was similar to the main revetment and was composed of vertical posts, principal baseplates up to *c* 8m long', and subsidiary baseplates. In contrast to the other revetments, whose boards had been pre-cut to similar lengths, the cladding here comprised the boards of a dismembered ship still nailed together. This 'boat revetment' was initially held in position by the weight of the revetted material, but this pressure subsequently caused it to collapse outwards into the water. The collapse may have been hastened by the clinkered boards' resumption of their former curvature, This smaller revetment was-linked to the main quayside by means of a rough fence, which probably served as a boundary demarcation rather than to facilitate berthing shins on its east side. This side was also protected (from tides?) by a post-and-wattle break-water infilled with estuarine mud. Although the timber-faced quay, Revetment 1, extended east and west beyond the confines of'the Wood Quay site, it cannot have extended very far west as the area now known as Merchants Quay was called the Strand (Clarke H B 1979, 37) in the 13th century, which suggests that it was a river bank lacking a sea wall. The 1221 Murage Grant 'in aid of enclosing that city and for the security and protection of it, as well as of the adjacent parts (Brooks 1936; Gilbert & Gilbert 1889, i, 7) may mean that the wooden quay front was later extended westwards along the Strand. The area of the quays was guarded by one or two warships ('grand galleys') moored in the river: one of these had been loaned to Bristol in 1233 and a second one was built in 1241 (Wood 1915, 255).

Revetment 2

Later into the 13th century a long wooden revetment was erected still farther out in the bed of the Lifley. In contrast to the first revetment and its extension, this appears to have been back-braced, although only the baseplates were recovered at the north-east corner of the site near Fishamble Street. This structure ran east west across the site and may have been connected to part of another revetment secured with a curious A-brace some 75m to the west on the same east -west line. This revetment made a sharp right-angled turn at Fishamble Street and appears to have presented a boarded quay corner on the east west and north-south fronts. The sharp turn upwards at Fishamble Street may have been to protect the revetment from tidal action like the earlier breakwater, or it may be associated with a 'fysshe slypp' at Fishamble Street, for which there is considerable later medieval documentary evidence. This was a slipway that enabled fishermen to land their catches before hauling them up to the fish shambles (Gilbert & Gilbert 1889, i, 290, 469).

The A-brace on the revetment at the west of the site was designed to combat the great pressure that the river exerted on the wooden quay front especially on its exposed back-braced uprights which were tenoned into baseplates. A large triangular brace *c* 2m high was half-lapped and pegged at the top, its legs being notch-jointed and pegged to main plates on each side of a pegged scarf-joint. The legs were also pegged to one of the posts which was thereby locked in position and prevented from jolting the joint out of place in the event of river pressure.

Revetment 3

A final wooden quay front was erected just north of that described. It was a back-braced revetment comprising uprights, boards, and principal baseplates which were anchored from the landward side by means of holed tie-backs. The latter were threaded through the revetment, a post in the hole at the outer end of the brace being pulled against the outside of the upright and a short post on the inside being secured in the ground by deeply driven pegs. This device had been used in Wood Quay almost three centuries earlier when securing the stave built palisade on top of Bank 3!

The wooden revetments or quayfronts at Wood Quay may have been primarily intended to act as the facing for an expanding vertical dockside outside the city wall protecting this reclaimed ground from riverine erosion. Secondly, the associated encroachment into the Liffey was probably intended to increase the draught of water. Whether the builders ever seriously believed in the possibility of such an achievement must be doubted, as the accomplishment of such a task in a broad shallow estuary seems to have been doomed to fail, as historical references reveal it did. Anyway, it may have been contemporary practice to let ships rest on the river bed until they were floated by high tide. This may have been the case at London, where there

were boarding stairs in front of the revetments (Milne 1979; Milne & Milne, forthcoming), though there is no evidence of these at Dublin, unless the wooden drains which ran between the sections of the revetment served in this capacity. Certainly, one of the drains had a top decking which could have been walked on. The inclusion of front braces at Wood Quay suggests chat ships may never have actually docked directly at the revetments, although the 'buffer' device might argue that it was intended that they should. A third reason for the revetments may be related to the desire to reclaim more land, perhaps to increase the available warehousing area at the busy port.

Stone quay wall, c AD 1300

In *c* AD 1300 a stone quay wall was erected just north of Revetment 3. This marked the final medieval extension to the waterfront and brought the line of the quays almost to that of the modern quayfront. About 18m of an apparently low (1.75m high) and broad (2.75m) wall was built just north of the last wooden revetment. It was not possible to establish whether its broad upper surface was original or whether the wall had been robbed down to this level. The possibility of a low wall with timber-framed supported tower house on top cannot be dismissed, as such structures were known in Waterford and Limerick even before the arrival of the Anglo-Normans (de Paor 1974, 255; Scott & Martin 1978, 67, 151).

The wall may not have been started until after 1305, when a city watchman was placed in charge of the 'entire of the River *Bunk'* (Gilbert & Gilbert 1889, i, 233) in this area, suggesting that the wall had not as yet been built. It was certainly started before 1308, when Geoffrey de Mortone fraudulently obtained the right to levy a custom on goods brought into the city for sale, claiming that the tower over the bridge was accidentally burnt and the city wall thrown down. Even though there were then (1308) defensible embattled houses between the gate towers along the Wall at Wood Quay (Jope & Seaby 1959, 115-18), in 1317 when Edward Bruce threatened to attack Dublin the Mayor and Commonalty took stones from St Saviour's Priory 'to make up their walls in the north side, upon the key and also the walls by Saint Tovins's [Olafs?] church and beside the gate there they made a tower and after repaired the walls by the Wine Tavern street' (Brewer & Bullen 1871, 138), suggesting that the construction of the eastern part of the wall along Wood Quay was not completed until it was hurried along by threat of the siege. It was probably this wall which was exposed during the building of Richmond Bridge to the west of the site, where the foundation of a wall found 'four feet above rudely formed boats (caulked with moss)' on a sank bank (Gilbert 1861, i, 381). The bottom of the wall found in the recent excavation rested on a similar bank at a higher level than the bottom of the revetments which it replaced.

Although *c* 85m of land were reclaimed from the Liffey at Wood Quay between 900 and 1317, the need for a greater draught of water appears to have persisted from medieval to later times. Even after the erection of the quays in 1305, 'no large ships laden with wines or other merchandise can touch at the port of Dublin until they are partially discharged whereby, according to a custom which has hitherto prevailed, ships laden with wines were wont to touch at Dalkey and there partly discharge and the wines so discharged were wont to be conveyed to the city of Dublin in small barks' (Sweetman 1886, 135). Dalkey remained the deep-sea anchorage for Dublin long after the completion of the stone quays, for as late as 1358 the merchants of Dublin complained to Edward III that 'from want of deep water in the harbour . . . . there never has been anchorage for large ships from abroad' (Gilbert & Gilbert 1889, i, 19-20).

As well as the shallowness of the river and the navigational difficulties which it presented, there seems to have been constant obstruction from the fishing interests of the abbeys of St Mary and St Thomas and the priory of the Holy Trinity. They made a pool or dam across the river so that 'boats can no longer pass up and down' (Went 1953, 163-73), and a dam was also built across the Poddle on the south side of the river (Clarke H B 1979). A directive was issued in 1220 to 'cause the river to be so enlarged and the pool so rectified that ships and boats with every kind of victuals, with stones and wood, may have free passage up and down the river' (Sweetman 1886, 149). Following vandalism by the priors of the fixed net near the bridge of Dublin near Wood Quay an agreement was made in 1261 whereby nets were to be emptied on the north bank of the Liffey (Gilbert & Gilbert 1891, i, 161), which meant that the Wood Quay area was free for trading vessels. The Mayor and Commonalty had also given permission to the Abbot of St Mary's Abbey 'to place nets and stakes on the land and strand of the north side of the river' (Carville 1972, 35-48).

The medieval encroachment on the Liffey was not confined to the south side. In the 13th century St Mary's Abbey on the north bank (near the present site of the Four Courts) had its own fleet of ships and a harbour (the Pill) which was made by lengthening the estuary of the Bradogue river (Carville 1972, 35-48). This harbour was not directly opposite Wood Quay so it can hardly be regarded as part of a concentrated attempt to confine the Liffey between quays on both banks.

Drains, first of wood and later of stone, were another major structural feature of the site. Some were built of reused ship's timbers and all ran roughly north-south at right-angles to the city wall and the revetments. They appear to have issued from wooden tanks outside the wall. The contents of the largest appear to have been periodically removed by the ebbing tide after the water had been admitted to the tank through a sluice gate. This drain measured over 40m in length, averaged 1.5m wide, and was was *c* .75m high. It was built in six different stages with uprights, baseplates, headplates, and side sheeting, which was secured in place by the pressure of dumped material. The top appears to have been used as a footpath at least for a time, perhaps to facilitate the loading of ships sitting on the river bed beyond the quayfront. Two of the wooden drains were replaced in later medieval times by stone drains, in use until the 18th century. Such great continuity from medieval to modern times recalls the earlier example of continuity in pre and post-Norman property boundaries.

The site has yielded a considerable number of ships' timbers of 13th century date in addition to those of the 11th century already mentioned. Among the parts of 13th century ships to have been found are frames, a bulkhead, stems, a keel, a beamknee, and two large Y-shaped timbers which may have been mast crutches or *mykes*[2]. Recent dendrochronological analysis of the Wood Quay ships' timbers (Baillie 1978, 260) showed that the wood is of Irish origin, so the boats were probably made in Dublin, possibly at or not far from the site under discussion. This is supported by documentary evidence which suggests that ships may have been exported from Ireland in the Middle Ages.

Considerable evidence of the trade contacts of the medieval port of Dublin has come from the artefacts recovered in the course of the excavation. Pottery was imported mainly from the Ham Green kilns at Bristol and from the south-west England-Severn Valley area generally, although Chester and east English wares are also in evidence. Glazed and polychrome jugs from the Saintonge and less fine specimens from north west France were also found, along with pottery from the Rouen-Paris-Beauvais region. Rhenish skillets, painted French and Mediterranean wares, Dutch vessels, and archaic *majolica* are much less numerous. English and French coins and ampullae from Canterbury also attest to foreign contacts.

Notes

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2. We are indebted to the National Maritime Museum, Greenwich, its Archaeology of Ship's Department, and Chief Archaeologist Dr Sean McGrail for specialist assistance with the Wood Quay ships' timbers.

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