Chester:—The Evolution and Adaptation of its Landscape

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The aim of this paper is to utilise the information gained from the many excavations carried out in the city of Chester and its immediate environs in order to (a) Reconstruct the original configuration of the landscape, (b) Analyse the influence of the major physical features upon the siting of the Roman legionary fortress and the Medieval city walls, and (c) Study the accumulation and distribution of the deposits which have resulted from nearly two millennia of human occupation.

The contour map which depicts the shape of the original landscape (fig. 10) was assembled from a compilation of the varying depths of 'natural' recorded in over fifty archaeological excavations. Additional soundings from building activities, gas sewer and electricity conduit repairs, and the results of test borings have been incorporated in order to amass the maximum number of independent depth measurements over the widest possible area. The term 'natural' as used in this survey does not always strictly refer to the surface of the rock but can include the thin layer of clay and sand which sometimes covers the sandstone. In areas where massive amounts of rock have been removed, such as the quarries on the southern side of the river, or in sectors where depth measurements have been few and far between, the original landscape has been restored in accordance with the general height and slope of the surrounding areas.

Although a sufficient number of soundings have been taken to make an accurate reconstruction possible there are two sectors where slight alterations may be necessary in the light of future information. They are the area enclosed by the sixty foot contour in the south-west beneath the Castle and the central part of the eastern area of the fortress. However, any such alterations would not affect the shape or depth of the major physical features which seem to have dictated the siting of the fortress.

In order to present a clear comparison between the original and 'modern' landscapes the large scale engineering works of the last two hundred years have been omitted from the second contour map of the city area (fig. 11). These include the canal, the railway cuttings and embankments, the Grosvenor Bridge and its approach roads, the Castle parade ground and County Hall, and all of the recent precincts, underground car-parks and the like. Thus in many ways figure 11 represents the ground surface as it was in the early part of the eighteenth century.

As can be seen from the map of the original ground surface (fig. 10) the area consists of a north-south ridge whose western slope is slightly steeper than its eastern counterpart. A short gorge has been formed to the south by the river Dee cutting its way westwards. Further dissection of the ridge has taken place due to the formation of several steep-sided creeks or gulleys. These occupy positions on the line of Souter's Lane, Lower Bridge Street, north-east to south-west across Nuns' Fields and immediately to the south of Lower Watergate Street. Two broad gulleys had been formed on the southern side of the river, one is now occupied by the suburb of Handbridge and the other, lying further to the west, has been bisected by the southern approach road of the Grosvenor Bridge. The river cliff slopes steeply from the 50 foot contour on the southern edge of the city whereas on the west it does so from the 35 foot contour (mean average height of river level taken as being approximately 6 feet.)

The course of the river on the western side of the city during the Roman period has been the subject of many discussions, most of which centred upon the positions of two archaeological discoveries. One of these was made on the site of the Gas Works in 1886[1]. Here the remains of what may have been a timber wharf were uncovered together with artefacts of Roman origin. The second consists of the wall which lies at the foot of the City Wall, near Nuns' Road. Many people have interpreted this masonry as once having formed part of the Roman quay[2] and although there is still a lack of evidence to confirm this theory it would appear to be the most plausible explanation. The position of the Water-Tower, which originally projected into the river channel, together with cartographical[3], documentary[4], and archaeological evidence clearly indicate that the river, or part of it, once flowed much closer to the city than it does today. It has long been acknowledged that the river once followed a different route but no adequate explanation of the manner in which its present course evolved has ever been given.

The present, landlocked, condition of the Roman 'quay' has often been accounted for by a theory which suggested that the river had moved from the eastern to the western side of the Roodee

within a period of fifteen hundred years. It should be made clear that this hypothesis did not propose the creation of the Roodee by the erosive power of the river during this period, which would clearly have been impossible, but rather that the Roodee was already in existence with the river changing its course due to natural, meandering processes. However, a cautious re-appraisal of the factors involved has provided an alternative, and slightly less speculative, explanation.

Indications as to the course of the river in the Roman period can be gleaned from the following sources. Firstly, the position of the 'quay' and timber 'wharf' described above. Secondly, the route of the river as recorded in documents and on maps of the Medieval and post-Medieval periods which although often inaccurate and very general in nature can provide some information. Thirdly, an appreciation of the power, speed and direction of the depositional and erosional forces which were present in the river at that time. Fourthly, the angle of the river's entry into the Roodee area. Finally, the height, slope and geology of the surrounding landscape.

An analysis of these factors would suggest that in the first century A.D. the river flowed across the Roodee area in two channels, the separation beginning at a point to the south-west of the Castle site and ending close to the north-west corner of the city walls. Thus the western channel would have followed a route similar to that of the present course of the river whilst the eastern channel took a more direct route parallel and close to the line of the western city wall (see fig. 9). It also appears probable that during periods of high tidal conditions the two channels would have coalesced, turning the Roodee into a vast sheet of water.

Due to natural silting-up processes the eastern channel seems to have been isolated by the tenth century and soon disappeared altogether, forcing the later inhabitants of the area to construct their port facilities to the south of the fortress.

ROMAN FORTRESS

The historical and strategic reasons for the placing of a fortress in this area of the north-west have been fully discussed by other authors[5] and need not be gone into here. The main factor

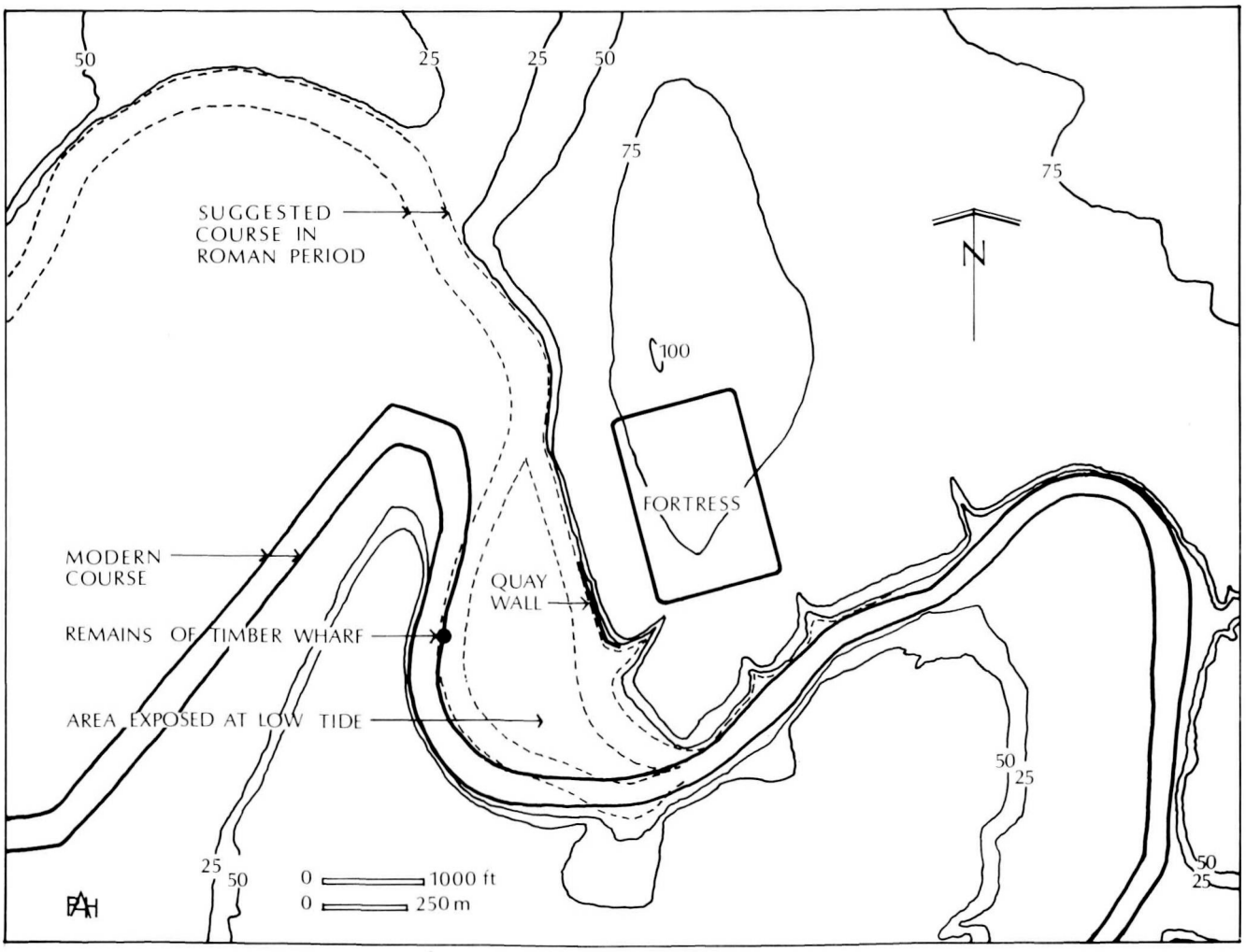


Fig. 9 'The siting of the Roman fortress in relation to natural features'.

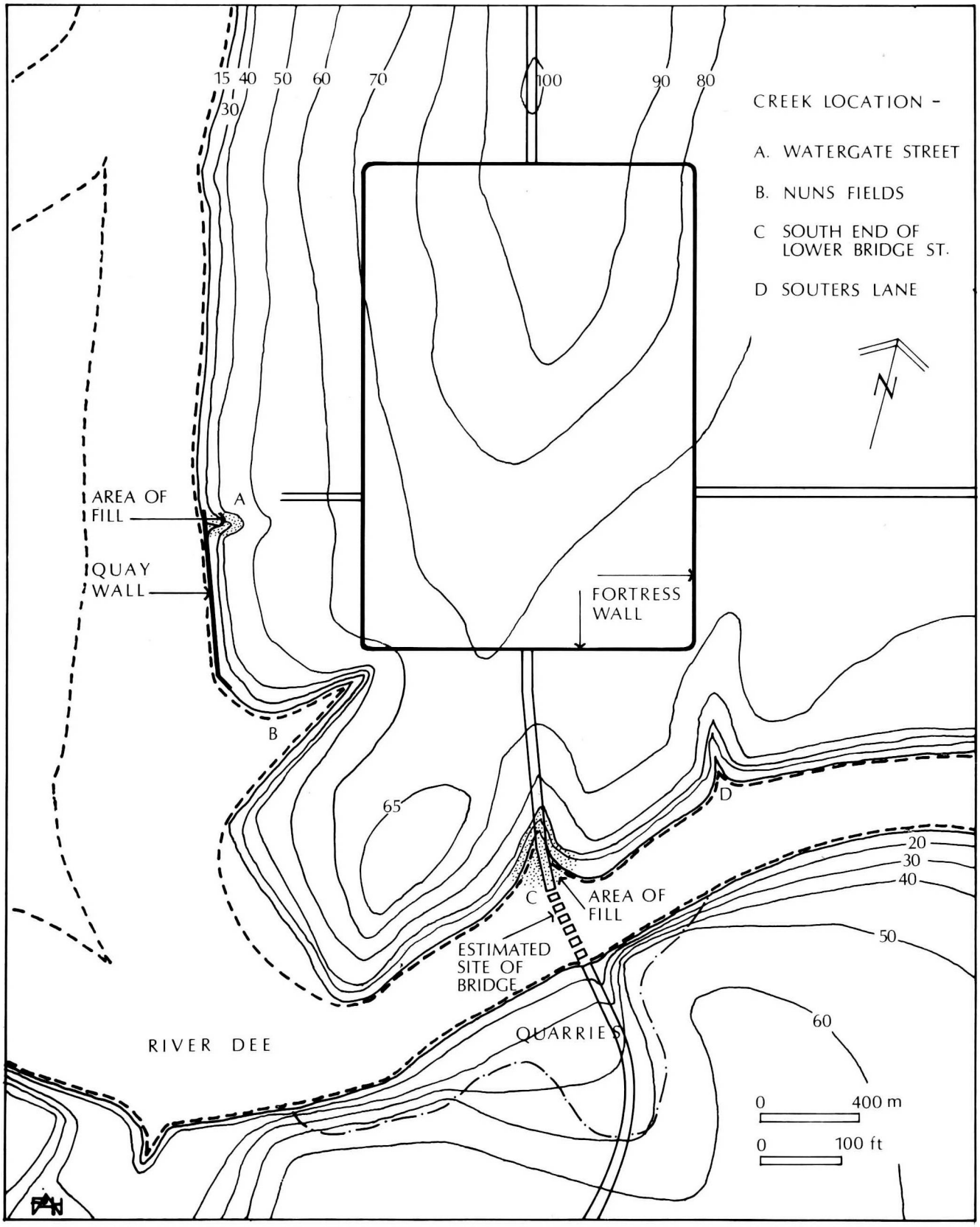
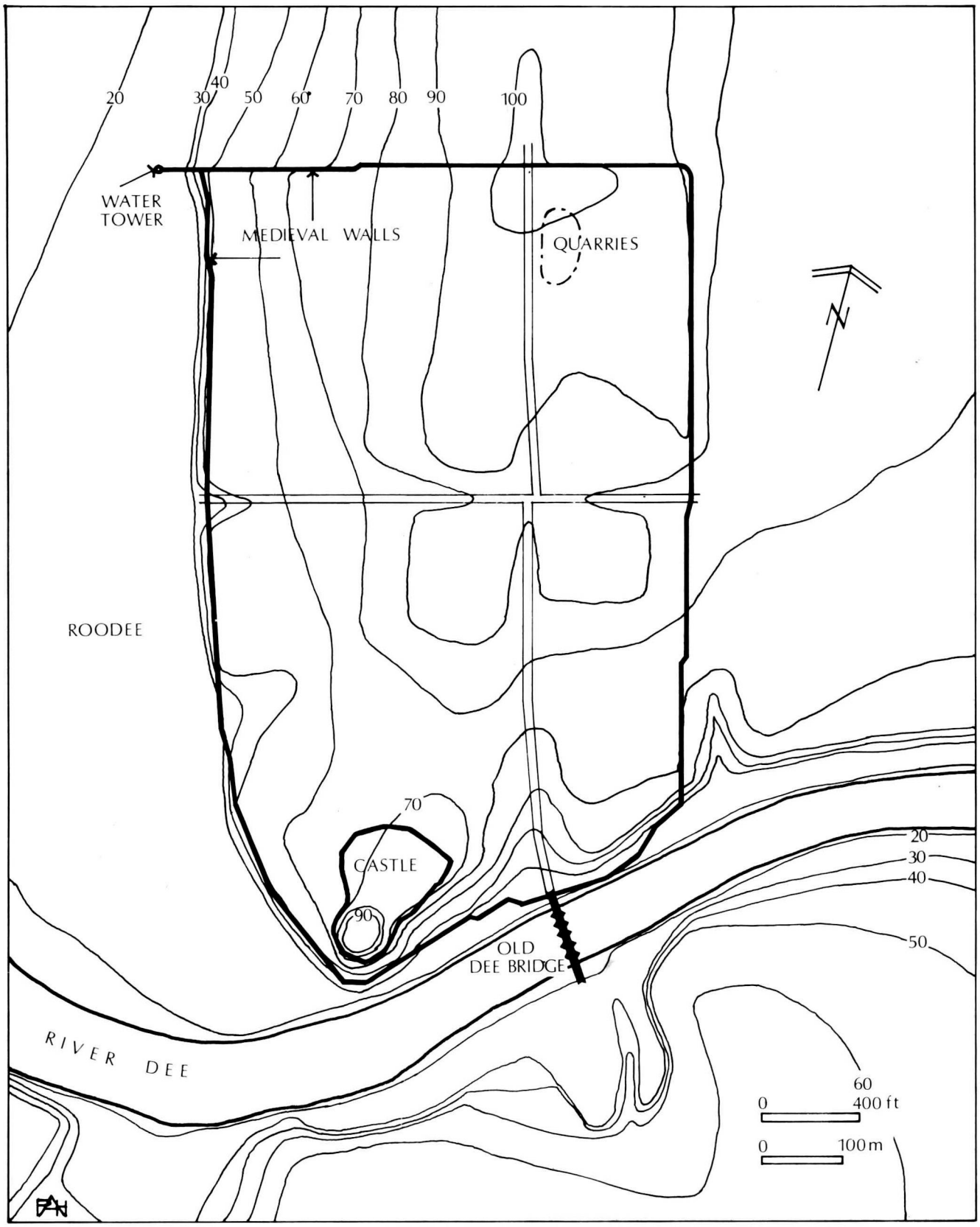

15 40 50 60 70 100 90 80
30
CREEK LOCATION -
A. WATERGATE STREET
B. NUNS FIELDS
C SOUTH END OF LOWER BRIDGE ST.
D SOUTERS LANE
N
AREA OF FILL
A
QUAY WALL
FORTRESS WALL
B
65
D
20
30
40
50
60
C
AREA OF FILL
ESTIMATED SITE OF BRIDGE
QUARRIES
RIVER DEE
0 400 m
0 100 ft

Fig. 10


20
30
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70
80
90
100
WATER TOWER
MEDIEVAL WALLS
QUARRIES
ROODEE
70
CASTLE
90
OLD DEE BRIDGE
20
30
40
50
60
RIVER DEE
0 400 ft
0 100 m

Fig. 11

which governed the choice of its site was the need for a position on the banks of a navigable river, preferably at the lowest possible bridging point. This location afforded a means of controlling native traffic between North Wales and the Pennines region and an alternative method of moving men and materials into and out of the area. As the Dee was tidal only as far as Chester a more southerly location would have been inaccessible to shipping. A position further down-river was ruled out by the presence of extensive marshlands on both sides of the channel. Thus the only possible site was in the immediate vicinity of the Dee's passage through the sandstone outcrop.

Although there were several locations suitable for the construction of harbour facilities there was only one where the erection of a bridge was at all feasible. This was the site now occupied by the 'Old Dee Bridge'. At this point natural, erosional forces had conveniently carved two gulleys into the sides of the river gorge exactly opposite one another, thus providing ready-made channels in which the approach roads to a bridge could be placed. The siting of a bridge to the east or west of this position would have involved the removal of large amounts of rock in order to construct approach roads of the required gradient and/or the building of causeways to cross marshy areas.

The location chosen for the fortress, situated astride the ridge, appears somewhat illogical especially when one considers the presence of large areas of level, and therefore one might think more suitable, ground lying to the east. A further peculiarity is the failure to include the highest point on the ridge within the defensive circuit. The explanation for such a flagrant disregard of what are normally looked upon as strategic or constructional assets must be that the possibility of protecting the river crossing afforded by the presence of natural gulleys at Souter's Lane and Nuns' Fields was regarded as too good an opportunity to let slip. By locating the fortress so that the south-east and south-west corners of the defences joined the heads of the gulleys the area to the south, and thus the northern approach to the bridge, was effectively isolated. A more southerly position was rendered impractical by the great variations in the height and slope of the ground surface. One further to the north or west would have deprived them of the advantages to be found in sealing off the bridge approach. An alternative siting which would also have controlled the latter would have been the aligning of the fortress on an east-west axis across the heads of the gulleys. However, this carried with it the disadvantage of having to surrender nearly all of the higher ground to a would-be attacker, a sacrifice they were apparently unwilling to make.

Although the decision to protect the river crossing in this manner resulted in the task of erecting the fortress and its buildings being slightly more difficult, the tactical advantages to be gained were considerable. The area between the gulleys could easily be defended by small numbers of troops deployed at key points. Thus in the case of an attack from the north or east a route for messengers, supplies and reinforcements could be kept open. If the enemy crossed the river further to the south, or in the event of a combined assault from the North and Wales, a complete encirclement immediately outside the defences could be prevented by destroying the bridge. Thus as long as the southern area remained under the control of the defenders they retained the possibility of communication by river and sea. In the case of an attack from the north or east the Romans also possessed the capability to send a detachment out over the bridge which could re-cross the river at Eccleston or Holt and so return on the east bank to take the enemy by surprise from the rear.

BRIDGE AND APPROACH ROADS

The gulley on the southern side of the river (the hollow now occupied by Handbridge) had been eroded in such a way as to form a very broad, gently sloping depression which afforded a gradual descent down to the water's edge. From recent studies it is now clear that the gulley on the northern bank, in the area defined by Shipgate Street and the eastern side of Lower Bridge Street, was of a very different character than its southern partner, being narrow, steep-sided and partially inundated by the river. The southern depression, although altered considerably by Roman quarrying, can still easily be discerned unlike that on the north whose contours have been greatly smoothed out by successive infillings. The extent of the northern gulley has been detected via several avenues of investigation. The first concerns the distribution of cellars along the line of Lower Bridge Street. In the buildings north of the junction of the aforementioned thoroughfare and Duke Street there is an almost complete absence of cellars. This is due to the rock being only a few inches below the ground surface. Thus the excavation of a full cellar would have required the removal of solid rock to a depth of approximately six feet, an effort which the Medieval and subsequent occupants considered to be excessive. However, south of the same junction the reverse situation is found to exist, every building having a cellar. This feature is the primary and most obvious indication that the section of the gulley in the Bridgegate area was once much deeper.

Additional information comes from a trench dug in 1959[6] in the roadway immediately opposite the 'Bear and Billet' public house. Although the trench reached a depth of ten feet there was no sign of the bedrock. By converting these findings to heights above sea-level it would appear that the ground level at this point could not originally have been more than seven feet above the river level. The results of this excavation, coupled with a study of the slope of the surrounding areas, make it clear that this depression was originally a narrow, steep-sided gulley, with the deepest section of its mouth occupied by the river. The inlet thus formed probably extended northwards to a point just inside the position of the present Bridgegate.

The 1959 trench also provided hints as to the route taken by the road which led from the south gate of the fortress to the river crossing. At a depth of 7½ ft. the east face of a substantial sandstone wall was discovered. It was aligned on a slightly north-west to south-east axis and was lying in made-up ground. The conclusion reached by the observer of these remains was that the wall had formed part of the eastern revetment of a causeway which had carried the Roman road to the bridge. The line of the southern, Medieval city wall indicates that the majority of land reclamation in this area took place in the early Middle Ages, thus the wall would seem to belong to a period before that. The fact that the alignment of the wall does not match up with that of the Medieval street nor with that of the contemporary bridge and gate would seem to point to the same conclusion. Thus, although there is no firm evidence to support the original interpretation there are several strong indications that it was, and is, the correct one. If this were true then it would imply that the Roman engineers had filled in the southern end of the gulley, including the inlet. Such an operation would have been an unavoidable stage in the process of constructing a bridge in this location due to the twin requirements of having gently sloping approach roads and as narrow a span as possible.

The course of the road on the southern bank of the river has been estimated by taking into account the easiest route as suggested by the original contours and also the areas of the depression which do not appear to have been quarried[7]. By combining the alignment of this estimated route with the position of the discoveries in Lower Bridge Street it is possible to give the approximate position of the Roman crossing as being slightly to the east of the present bridge. The site of the northern end of the Roman structure would appear to be at almost the same spot as that of its successor whilst its southern terminus seems to lie slightly to the east of the modern alignment (see fig. 10).

HARBOUR FACILITIES

The course of the Dee in the Roman period and the location of the harbour have already been discussed in the first part of this article and so it remains for this section of the text to deal with the modification of the landscape to the west of the fortress. The excavation of the site of Watergate House[8], carried out in 1959 under the direction of Mr. F. H. Thompson, revealed that during the construction of the 'quay' wall the Romans had sealed off and filled in a small east-west creek, situated approximately 100 ft. south of the western end of Lower Watergate Street (see fig. 10).

The second and more enigmatic alteration came to light during recent building operations at the western end of Cuppin Street[9]. Across most of the site the rock was found at a depth of two to three feet below the present ground surface but close to the western perimeter it suddenly disappeared in a vertical face. Subsequent test drillings revealed that over thirty feet of rock had been removed from this area. Due to the confined and difficult nature of this exploration it was impossible to discover the extent of this feature or the date of its excavation. However, the evidence from this site would seem to indicate that some, if not all, of the head of the Nuns' Fields creek had been artificially deepened. Although the most likely explanation for this enlargement would be Roman or Medieval quarrying operations we should not overlook the possibility that it may have been a part of the harbour facilities of the fortress.

THE MEDIEVAL CITY WALLS AND CASTLE

From its Aethelflaedan re-birth[10] in the tenth century Chester soon emerged once more as a recognisable centre of population, this time in the guise of a thriving town fully involved in the mainstream of commercial activity. This 'new' occupation was of a purely civilian nature and consequently its character and layout was very different to that of the earlier fortress. Although the number of inhabitants was probably less than that of the legionary base (at full strength), the area they occupied was greater. This was due to the lack of any overall authority to plan and control the early growth of the community together with the need for large areas of open ground

which were necessary in a self-sufficient type of community such as this. These expanses of open land were required for semi-agricultural, storage and industrial purposes as well as religious precincts, cemeteries, rubbish-dumping areas and common land. The positioning of their dwellings and workshops also caused the settlement to occupy an area larger than would seem necessary. As the majority of the inhabitants depended upon the regular sale of their articles or craftsmanship for a living it was obviously essential that their premises should be situated along the street frontages. The result was the formation of lines or strips of buildings huddled closely together with large areas of relatively un-used land to the rear[11].

One further factor which influenced the extent of the settlement area was the change in the course of the River Dee. During the seven centuries between the end of Chester's role as a Roman fortress and its re-emergence as a Medieval city the river had moved westwards from the site of the Roman harbour resulting in the disappearance of its eastern channel and the formation of the area of land now known as the 'Roodee'. As a consequence of this movement the site of the harbour had to be at the southern extremity of the city, in the vicinity of the 'Old Dee Bridge'. This induced many of the traders and merchants to erect their dwellings and warehouses in the Lower Bridge Street area, thus increasing the extent of the settlement area. When the City Walls were erected in the late twelfth or early thirteenth century these southern suburbs and the area to the west of the original fortress site were included within their circuit. (There is some evidence for the belief that the erection of the city wall represents the strengthening and consolidation of a line of defences which had been in existence since the late Anglo-Saxon period[12], though this has yet to be proved conclusively.)

The influence of the natural features upon the route of the city walls is immediately apparent and requires little elucidation. The line of the southern extension to the eastern fortress wall was dictated by the shape and position of the creek at Souters Lane. This resulted in the Medieval extension being set slightly back and to the west of the line of the Roman wall. The kink in the alignment of this section can be seen at a point immediately to the north of the present Newgate. By so positioning the wall this stretch of the city defences was automatically provided with a ditch. A similar occurrence took place along the route of the western extension to the northern fortress wall. This also was a case of a natural feature affecting the architect's decision and of their using its presence to the best advantage. Just to the south of the line of the northern fortress wall and parallel to it there existed a slight ridge which continued westwards to the river and there formed a small projection into the channel. The Medieval wall followed the crest of this ridge and in so doing caused the formation of another kink along the circuit of the city wall. This can be observed by comparing the alignments of the stretches of wall to the east and west of St. Martin's Gate. In the fourteenth century the slight projection of rock into the river channel was chosen as the site for the construction of the Water Tower, an ideal position for guarding the river route into the city.

On the south and west the city walls were built as close as possible to the water's edge. This reaped the dual benefits of having only two sides of the city open to attack by land and also the means of bringing water-borne cargoes quickly inside the defences. The completion of the defensive circuit involved the sealing off of the creeks at Nuns' Fields and Lower Bridge Street, an event which accelerated their infilling and obscurement.

The area to the south-west of the fortress was the obvious site for the construction of any small, fortified stronghold having the river and/or a steep slope on three sides. In addition to its defensive advantages it was also a position which could exercise some control over bridge and river traffic. Its potential was quickly appreciated and it has been occupied by a succession of military enclosures from the eleventh century to the present day. The first of these constructions was the motte and bailey castle erected by the Normans in c. 1070 A.D.[13] An integral part of this structure was an artificial mound built at the south-western tip of the area, thus extending the natural spur. The thirteenth century castle utilised the same defensive advantages, though encompassing a greater area than its predecessor.

THE EFFECTS OF HUMAN OCCUPATION UPON THE LANDSCAPE

It is almost impossible for the landscape of any area which man has occupied for a considerable period to escape modification of one sort or another. Chester, as we have seen, is no exception. Several recent excavations have indicated that a certain amount of levelling took place prior to the erection of the fortress buildings[14]. However, much more information needs to be recovered before it will be possible to judge the extent of these operations. Three to four centuries of Roman occupation contributed an average of five to six feet of deposits to the area within the

fortress, with lesser and more variable amounts of material added to the ground surface immediately outside. As mentioned above, the creek near Watergate Street was filled in and that in Lower Bridge Street probably received similar, though only partial, treatment. Works of an opposite nature, namely quarrying etc., took place mainly on the south side of the river. It was in this area that the Romans obtained the vast amount of sandstone required for the successive rebuildings of the fortress. The smaller, though still considerable, amount of rock removed from the head of the creek in Nuns' Fields appears to have been the only area of quarrying on the north side of the river.

The sectors in which the maximum accumulation of post-Roman deposits took place can be divided into two broad groups:— (a) to the rear of houses along the principal thoroughfares, and (b) against the inner face of the Medieval city wall. The pattern of occupation (see above) within the city consisted of dwellings clustered along the street frontages with large areas of open ground to the rear. There were exceptions to this pattern such as church and monastic precincts and orchards but the majority of the larger of these institutions were situated at the edges of the main settlement area. It was not until the latter half of the seventeenth century that these open areas began to be used for building purposes.

The main streets of the city were kept clear of deposits partly by the eroding effect of traffic and partly by legislation(15) designed to prevent such occurrences. However, no such regulations were introduced to stop the dumping of material on the areas to the rear of the streets and consequently the gradual formation of mounds of material took place. The position of the four main streets of the city (which closely followed the line of the four main streets of the earlier fortress) together with the boundary marked out by the city wall separated these formations into four 'islands' of high ground behind the street frontage buildings. As can be seen from Fig. 11 the resultant shape of the contours of this area is practically that of a four leaf clover. Although large areas of the accumulation pattern have been destroyed in recent times by the totally destructive character of modern development there are a few surviving examples:— Thirteen feet of deposits on either side of Upper Bridge Street, the north side of Eastgate Street where 12-14 feet of material has built up near Godstall Lane, and deposits up to 11 feet thick on the south side of Upper Watergate Street (all measurements include Roman deposits). Along the streets outside the original area of the fortress but within the circuit of the Medieval wall a similar depositional pattern has evolved. Though this is on a smaller scale due to the less intensive nature of the occupation. Thus from the frontage of Lower Bridge Street to the western end of Castle Street the depth of overburden increases from six inches to nearly seven feet.

The process of accumulation in the second group of areas began in the Roman period with the erection of an earthen rampart(16) which formed the defences of the 'timber-phase' fortress. Thus when the city wall was built in the thirteenth century a considerable bank of material was already present along sections of the north and east sides. Despite these sections having something of a head-start it was against the western city wall that the greatest build-up of material took place. Here the deposits have accumulated until they reached the same level as the walk-way of the city wall, a depth or thickness of 20 feet. Elsewhere along the circuit the depth varies between 12 and 17 feet, the build-up generally increasing as one moves further away from the north-south axis of the city.

There are also areas where more localised accumulations have occurred which do not fit into either of the two categories described above. The two major examples of this type are the Castle and the Cathedral. The latter has been the site of ecclesiastical complexes for many centuries and the residue of material from their re-buildings, demolition and alteration plus the numerous interments in the nearby cemetery has resulted in a considerable build-up of material. The initial alterations to the landscape of the Castle area for the erection of the Norman motte and bailey structure have been described above. The subsequent modifications of this sector caused by the construction of later military enclosures were mainly in the form of levelling operations, culminating in the shape of the present parade ground.

Since the erection of the city walls in the thirteenth century the creek at Nuns' Fields has gradually been filled in with the result that only a shallow depression now remains. The southern end of the creek in Lower Bridge Street also seems to have been an area where land reclamation took place early on in the Medieval period. Since that period it has undergone many alterations, its western slope has been quarried away in recent years to facilitate the erection of the County Hall complex and most of the original contours have been smoothed out. Only the creek at Souters Lane retains something of its original outline.

There is one area of the city which has escaped large scale accumulation of material and that is Upper Northgate Street and the Market Square. This is due to its almost continual use as a site for fairs and markets and also because of the tendency for material to be deposited in such a way

as to level out the landscape within the confines of the city. Nearby, to the east of Upper Northgate Street, recent excavations[17] have shown that a large amount of rock was removed during the Medieval period. This man-made depression was 25-30 feet deep and extended over an area approximately 300 feet square. It was probably the result of quarrying operations which possibly provided stone for use in the Cathedral buildings nearby.

Human occupation on the site of Chester has also had its effects upon the character of the River Dee. Although the silting-up of the river and its estuary were due to natural processes they were helped and possibly accelerated by man's interference. A clear example of the results of this combination can be seen where the river passes to the south of the city. Here natural silting, rubbish dumping, land reclamation, the construction of the city walls, the erection of the Dee bridge and the Weir have combined to reduce the width of the river channel and made the formation of sand banks and shallows possible.

SUMMARY

Since the latter half of the first century A.D. Chester has been the site of almost continuous human occupation. Indeed, evidence may yet come to light which will demolish the long-accepted theory that it was deserted between the fifth and ninth centuries and so establish a completely unbroken sequence. For the purposes of this study the occupation, and its effects on the landscape, falls neatly into two categories: (a) Roman military, and (b) late Saxon onwards, civilian. To treat these settlement phases as two, totally, unrelated entities can be justified not only by their obvious chronological separation but also by the dissimilarity in their origins, characters, time-spans of development and effects on the landscape. The only link between these two periods is the fact that the ruins of the Roman fortress provided a core around which the later settlement evolved.

The person or persons who chose the exact site of the fortress had a completely free hand to erect their establishment in whatever position they considered to offer the best strategic advantages. Being a military base the fortress was designed on strictly functional lines, every square foot of land included within its confines serving a predetermined purpose. In such a highly disciplined community it was virtually impossible for any, unofficial, accumulation of material to take place. Outside the fortress the major physical features were incorporated into the defensive network of the settlement or were adapted to suit the needs of extra-mural engineering works, such as the harbour. Thus most of the creeks were kept free of deposits in order that their defensive capability would not be diminished, whilst others, such as that in Lower Bridge Street, were modified for particular uses.

This efficient and closely regulated form of occupation contrasts vividly with that of the Medieval city. The fortress had been constructed in a more or less single operation in accordance with laid down rules and specifications whereas it took nearly three centuries for the later occupation to develop into an establishment of similar size and importance. Unlike their Roman predecessors the Medieval city authorities had very few, practical, choices open to them with regard to the siting of a defensive circuit. The route was dictated by the position of groups of pre-existing structures and facilities, such as the harbour, and the necessity of including them within the defences. The civilian character of this community together with its subsequent evolution into a major trading centre caused it to occupy a larger area than the fortress had done, and also resulted in the formation of its particular pattern of soil accumulation.

The presence of successive, human settlements has altered the landscape of the Chester area in three main ways. Probably the most noticeable of these has been the infilling and virtual elimination of the major depressions. In some cases this has been the result of deliberate policies of land reclamation, such as took place in the Roman period with the creeks in Lower Bridge Street and Watergate Street. In others, such as the creek in Nuns' Fields, infilling has occurred due to there being a convenient hollow into which rubbish could be thrown. The second and more subtle modification has taken the form of a gradual process of levelling within the area of settlement. This began in the Roman period with the *removal* of relatively small amounts of topsoil to provide a reasonably level surface for the erection of the fortress buildings. It continued throughout the Medieval and post-Medieval periods although the attainment of a level horizon in this era was achieved by *deposition* and not excavation. For the most part this later levelling seems to have been due to the unregulated dumping of refuse. However, there is some evidence for believing large amounts of soil were brought into the city at some point in the Medieval period in order to level out the area to the west of the fortress site and provide extensive areas of allotments or 'crofts'[18].

The third category of change has involved the creation of abrupt, artificial and mainly small-scale differences in the height and slope of the ground surface within the area of settlement. The majority of them came into being as a result of the build-up of material behind the street frontages. The difference between the street level and the height of the ground at the rear of a building could often be as much as six or seven feet. Examples of this phenomenon have been given earlier in the text. The erection of the city walls provided a further means whereby sudden changes could develop. The deposition of material against the inner face of the walls coupled with the necessary prevention of the same thing happening against their outer face conspired to allow the formation of an almost vertical drop along the perimeter of the city. In some locations the change in level was as much as twenty five feet. This 'cliff' was at its smallest along the southern boundary of the city and at its greatest along the western boundary. In addition to these systems or patterns of features there are several areas where larger and more drastic changes have taken place. The most outstanding of these are the Castle mound and the cliff formed by quarrying on the southern bank of the river.

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14. Crook St., Goss St., and Northgate Brewery phase II, reports forthcoming.
15. *'Chester under the Three Edwards'*, H. J. Hewitt, pp. 71-73, also *'Chester in the Plantagenet and Tudor Reigns'*, by R. H. Morris which contains copies of many documents, the originals of which are housed in the city archives.
16. *'Roman Cheshire'*, F. H. Thompson, pp. 24-27.
17. *Chester Archaeol. J.*, 58, 1975, 135.
18. 'Place-Names and Street-Names at Chester', J. McN. Dodgson, *Chester Archaeol. J.*, 55, 1968, 30-33.