ROMAN BRIDGES ON DERE STREET, COUNTY DURHAM

WITH A GENERAL APPENDIX ON THE EVIDENCE FOR BRIDGES IN ROMAN BRITAIN

By D. P. Dymond

In the face of various threats to Roman Dere Street within the mining and industrial area of Co. Durham, a survey of the road between Bishop Auckland and Lanchester was undertaken by the Royal Commission on Historical Monuments (England), and carried out at intervals in 1959. This is a report of the most important results of that survey. I am indebted to the Secretary of the Commission for permission to publish information gathered in the course of official work[1].

Dere Street is the English name applied to the northern stretches through Co. Durham and Northumberland of the main Roman road from York, Lincoln and the South to the military zone of Hadrian's Wall and beyond it to the Forth. Haverfield significantly called this road 'the Roman Great North Road'.[2] In origin, it was probably a military supply route, built during the first advance of the Roman Army under Cerialis or Agricola (or both), but later it became established as the main supply route to the Wall from the base fortress of York and the civil zone in the South. Along it were strung important military and civil settlements, such as Catterick, Piercebridge, Binchester, Lanchester, Ebchester and Corbridge. A parallel route to the North from York and the East Riding, *via* Thirsk, Chester-le-Street and Newcastle, was also probably 1st-century in origin, but judging from the absence of important stations it never thereafter competed seriously with Dere Street as the main northern route.[3] When the Hadrianic Wall system was complete, Corbridge was an important military and civil centre and road-junction, and must have witnessed daily the arrival and departure of troops, chariots and supply-waggons along the vital artery of Dere Street[4].

A road of such importance must necessarily have been carefully engineered, so that troops and supplies could be moved speedily and efficiently. The whole safety of the province could, at times, depend on this road, so one might expect a high standard of engineering and construction. Excessive gradients had to be avoided, and obstacles had to be made negotiable at all times of the year. Of course, improvements and modifications, and even slight changes of direction, must have been made in the course of four centuries. The road followed by the modern field-worker is, therefore, the result of four centuries

[1] In addition, I am grateful to my colleagues, H. G. Ramm and R. M. Butler, for help and advice during the survey, and in the preparation of this Report. A third colleague, J. E. Williams, kindly undertook the artist's reconstruction of the bridge over Hunwick Gill. Thanks are also due to Prof. I. A. Richmond, Mr. I. D. Margary, Mr. R. R. Clarke and Mr. S. S. Frere for valuable advice and information.

[2] *Northumberland Co. History*, X, 457. South of the R. Tees, this route was known as Leeming Lane; Watling Street is another name applied to this road in historic times.

[3] For the course of these two roads, see O.S. *Map of Roman Britain* (1956). See also I. D. Margary, *Roman Roads in Britain*, II, 227. He suggests the E. road is the earlier, built during the Brigantian campaign, but it could of course be entirely Hadrianic in date, associated with Pons Aelius and S. Shields.

[4] In the Antonine Itinerary, Dere Street is specified as the main northern route in Routes I, V and VIII.

of reconstruction and modification on the basis of the original military road of the 1st century.

Between the forts of Vinovium (Binchester) and Longovicium (Lanchester), Dere Street pursued a Z-shaped course, remarkably less straight and direct than anywhere else in its whole length (see Fig. 1)[1]. The reason for this double bend over more than twelve miles is not obvious: the answer may possibly

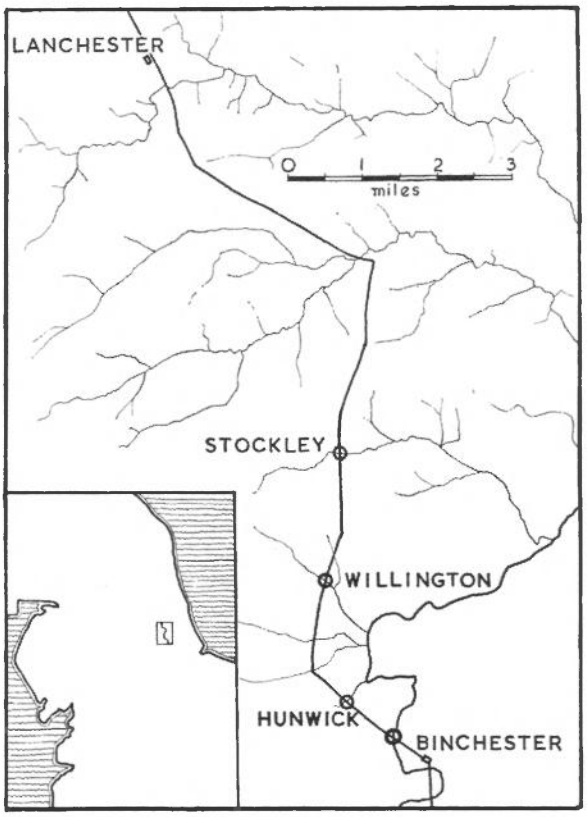


Fig. 1. Dere Street, County Durham

lie in the disposition of roads and forts in the 1st century. A straighter course could have been followed a little to the west through Stonechester and Cornsay Colliery, as there are no worse obstacles to overcome.

The course of the road between Vinovium and Longovicium, as recorded by MacLauchlan[2] and the Ordnance Survey[3] was confirmed by the 1959 survey. Previous field-workers[4] seem, however, to have overlooked the river and

1 Noted by T. Codrington, *Roman Roads in Britain*, 198: 'from Binchester to Lanchester there is an absence of that directness which is usual in Roman roads'.
2 H. MacLauchlan, *Survey of Watling Street* (1852).
3 O.S. 6 in. maps, NZ 23 S.W., 13 S.E., 13 N.E., 23 N.W., 24 S.W., 14 S.E., 14 N.E.
4 MacLauchlan, *op. cit.*; J. Mothersole, *Agricola's Road into Scotland* (1927); I. Margary, *Roman Roads in Britain*, II (1957).

stream crossings where the Roman engineer was faced with his greatest problem. The only fully reliable way of crossing water is by a bridge; flagged fords, though they probably existed on Dere Street in the early period, would be very dangerous when the rivers were swollen. Equally, a zig-zag to negotiate a steep-sided gill would be very difficult for heavy wheeled traffic. In Co. Durham particularly, Dere Street had to cross a succession of rivers and streams, running west-east, which could be very turbulent and swollen at times and difficult to approach in deep valleys or gills. The 1959 survey was undertaken with these considerations in mind: Dere Street had already produced safe evidence for four major Roman bridges, and three probable ones (see list below), and as a result of the survey four completely new bridging points were recognised. These were at Binchester, where physical evidence exists of a large bridge with stone piers, and at Hunwick Gill, Stockley Gill and Willington South Dene, where small, presumably wooden, bridges can be safely inferred.

The Stone Bridge at Binchester (Grid Ref. NZ 204318)

There is no doubt as to the exact point where Dere Street crossed the River Wear. On the west side of the river the line is fossilized in a modern raised trackway, and on the east, although the course has not been visible for at least 100 years[1], the metalling was found in 1911–12 during the making of the Sewage Farm[2].

When the site was first visited in March, 1959, nothing was visible on the east bank of the river, but the western (under much undergrowth and half buried in mud and water) produced three rusticated stones. A further visit in August, 1959, during the exceptionally dry summer, revealed another rusticated stone and several squared blocks lying in the river-bed. It is significant that, where Dere Street crossed, a line of stones lies in the river-bed forming minor rapids. The present width of the river is 80 ft.; the width and direction may have been slightly different in Roman times.

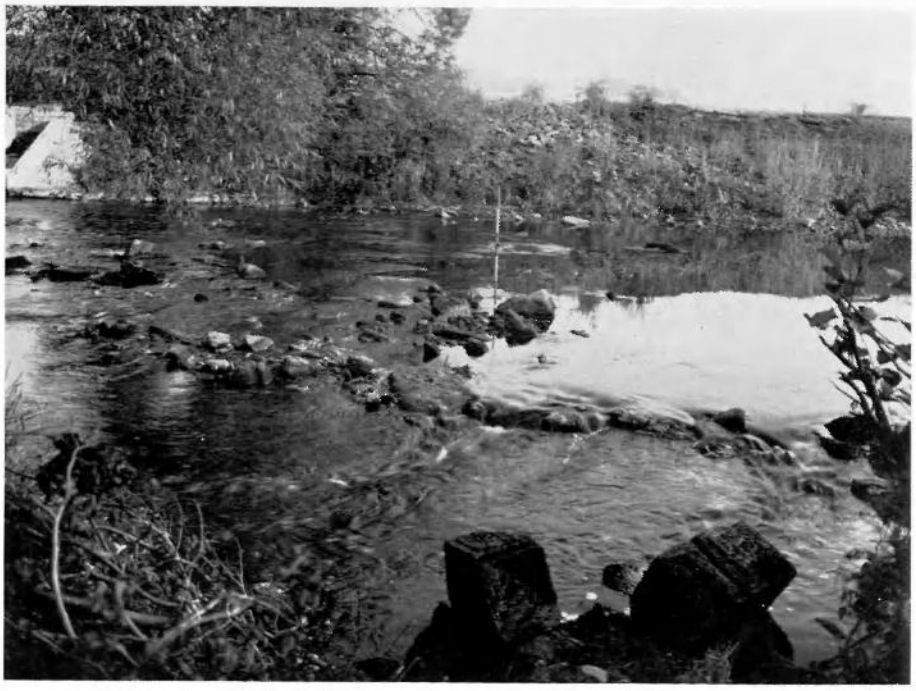
Description of the stones (Plate VII)

1. A large block, 2 ft. 8 in. by 1 ft. 2 in. by 1 ft. 4 in. The upper surface shows two distinct panels of rustication, with smooth chiselled edges, separated by a central groove. One end of the stone showed half a broken groove, similar to the central one. The other end was broken, but there seemed to be a rough chamfer for two-thirds of the width of the stone. At the side of one of the rusticated panels was a nick (possibly the remains of a cramp-hole). One surface showed distinct marks of rough dressing with a pick.

2. A trapezoidal block, 1 ft. 7 in. by 10 in. by 1 ft. 1½ in. Two surfaces bore rusticated panels with chiselled edges similar to the first stone; other resemblances were half a groove next to one rusticated panel, and a broken nick at the edge of another. The angle between the rusticated surfaces and the sloping one was approximately 128°.

3. A large stone buried in the western bank, with only one surface completely visible; this measured 3 ft. by 1 ft. 1 in. and bore distinct criss-cross tooling marks. It was possible to feel a small area of the under-surface; this was rusticated with chiselled edging.

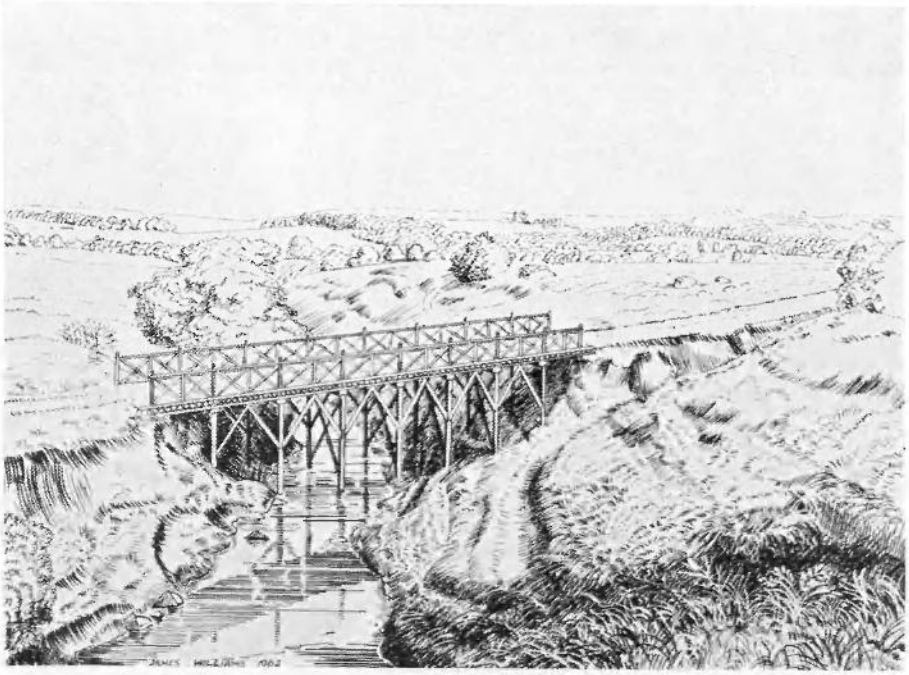
[1] MacLauchlan was unable to see any traces, 1850–1.
[2] For this information, I am indebted to Mr. M. Wilson of the Durham Co. Library. A coping-stone in the Sewage Farm is inscribed, 'Roman Road'.



A. Site of bridge over river Wear, near Binchester
(*Crown Copyright*)

B. Fallen masonry in river Wear, near Binchester
(*Crown Copyright*)

A. Site of bridge over Hunwick Gill from S.W.
(*Crown Copyright*)



B. Reconstruction of bridge over Hunwick Gill

4. A rectangular block in the stream-bed, approximately 20 ft. from the western bank, showing at least one rusticated surface with chiselled edging.

All the stones which had been shaped, rusticated and plain, consisted of the same yellow sandstone, the local carboniferous rock. The rusticated panels were not all of the same size, but there was an overall similarity, which implied that they came from the same structure — probably a bridge with stone piers and a timber superstructure[1]. Although the four rusticated stones had been eroded by the river, it seems probable that the rustication was artificial and that the panels had been considerably tooled to produce a vermiculated effect. No. 2 is particularly interesting for its shape. By analogy with the stones from the Roman bridge at Summerston or Chesters (see p. 157) it may come from a pier, at the angle where the cut-water joined. Alternatively, it could come from the angle of a splayed stone abutment. It is not yet possible to point to a similar use of rustication within the fort of Binchester — this might provide some clue to the date of the bridge. If the interval between the piers was the same as at Corbridge, the Binchester bridge would have had three or four piers in the river.

The Bridge Abutments at Hunwick Gill (Grid. Ref. NZ 194326)

Three-quarters of a mile to the north-west of the Binchester crossing, Dere Street had to negotiate the steep-sided and narrow Hunwick Gill. This gill, 50 ft. wide from lip to lip and 20–25 ft. deep, is sharply riven in the surface of a plateau. It is therefore too steep and narrow to have been negotiated by a zig-zag. In addition, the road on each side leads to the very lip of the gill (Pl. VIII). The only possible interpretations of the existing earthworks are that the road crossed by a bridge or by a solid causeway. The latter can be dismissed, as there is no trace of the causeway or a washed accumulation of soil downstream. Dere Street must therefore have crossed the gill by means of a bridge, which was almost certainly wooden. The gill was carefully searched for dressed stones, but none were found. Although the abutments are somewhat eroded, excavation might well reveal the post-holes of a timber bridge[2].

The west side of Hunwick Gill is a few feet lower than the eastern at the point where the road crosses. The constructors of Dere Street took advantage of a slight cleavage in the eastern side of the gill to bring the road and eastern abutment down to the level of the western lip of the gill by means of a sloping artificial ramp (Fig. 2 and Pl. VIII). The eastern abutment was therefore a large artificial construction, built of clay, stones and gravel, which despite erosion survives to a considerable height. On the western side 56 ft. away there was no need for a large, artificial abutment, as the roadway was already at the level at which it was to cross the gill. Such artificial banking as there was on this side has been almost eroded away by animals and weather[3].

The eastern causeway and abutment undoubtedly carried a roadway which was narrower than the normal width of Dere Street (30–35 ft.)[4]. The present

[1] Another possible interpretation is that the stones came from the stone abutments for a completely wooden bridge.

[2] At Denver in the Fens, two post-holes were found in the earthen abutments of a Roman bridge. *Geog. Journal*, LXXXII, No. 5, 434.

[3] A reconstruction of the Hunwick bridge, based on the military bridges illustrated on Trajan's Column in Rome is shown in Pl. VIIIB. The main structural features of these bridges seem to be the stout upright timbers and the diagonal bracing, a flat roadway and a criss-cross parapet.

[4] The best preserved stretch of Dere Street between Binchester and Lanchester is on Brandon Down, near Brancepeth (Grid Ref. NZ 203406).

abutment is 40 ft. wide with a flat top, representing the roadway, 11 ft. wide. Although erosion has taken place, the original width of the bridge was probably not much greater than 11 ft. From this and other sites, it seems likely that the timber bridges and their abutments were narrower than the normal width of the roads. Perhaps such bridges would only be able to take one-way wheeled traffic[1].

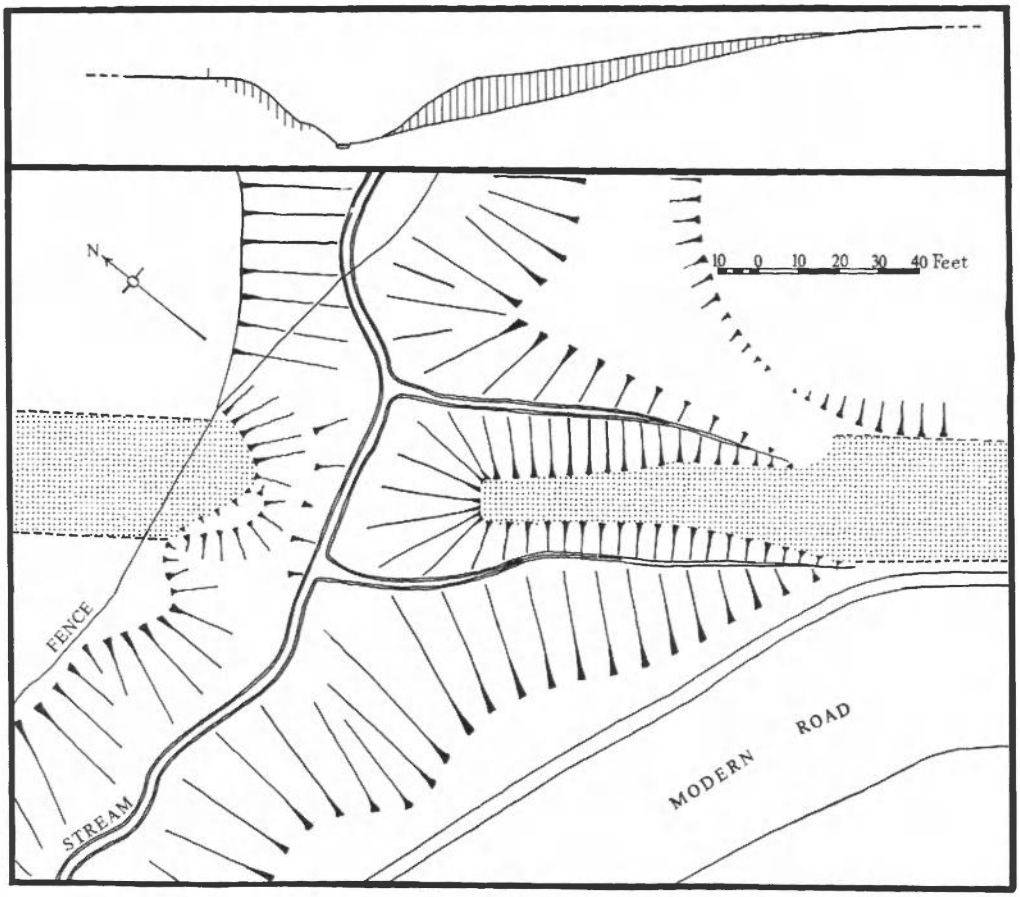


Fig. 2. Bridge abutments at Hunwick Gill

The Bridge Abutments at Willington South Dene (Grid Ref. NZ 192352)

A mile from the centre of modern Willington, Dere Street crosses Willington South Dene, a sharp gill 50 ft. wide and 20 ft. deep. As at Hunwick, the road on each side leads right to the very edge of the gill, leaving no room for a zig-zagging course. As the road is so high above the stream no large artificial abutments were needed, and the bridge took the road across at the level at

[1] The same fact was noticed at the stone bridge of Summerston, which was 17 ft. wide. S. N. Miller, *The Roman Occupation of S.W. Scotland* (1952), 93.

which it approached on each side. On the northern side, an accumulation of earth and cobbles, 35 ft. wide and 2–3 ft. high, represents the remains of a small abutment[1]. On the southern side, the edge of the gill is obscured by modern tipping. As before no indication of a stone structure was found.

THE BRIDGE ABUTMENTS AT STOCKLEY GILL (Grid Ref. NZ 197380) (Fig. 3)

In the two examples last mentioned the gills had been sufficiently narrow and steep to allow the bridges to cross without variation of level. At Stockley

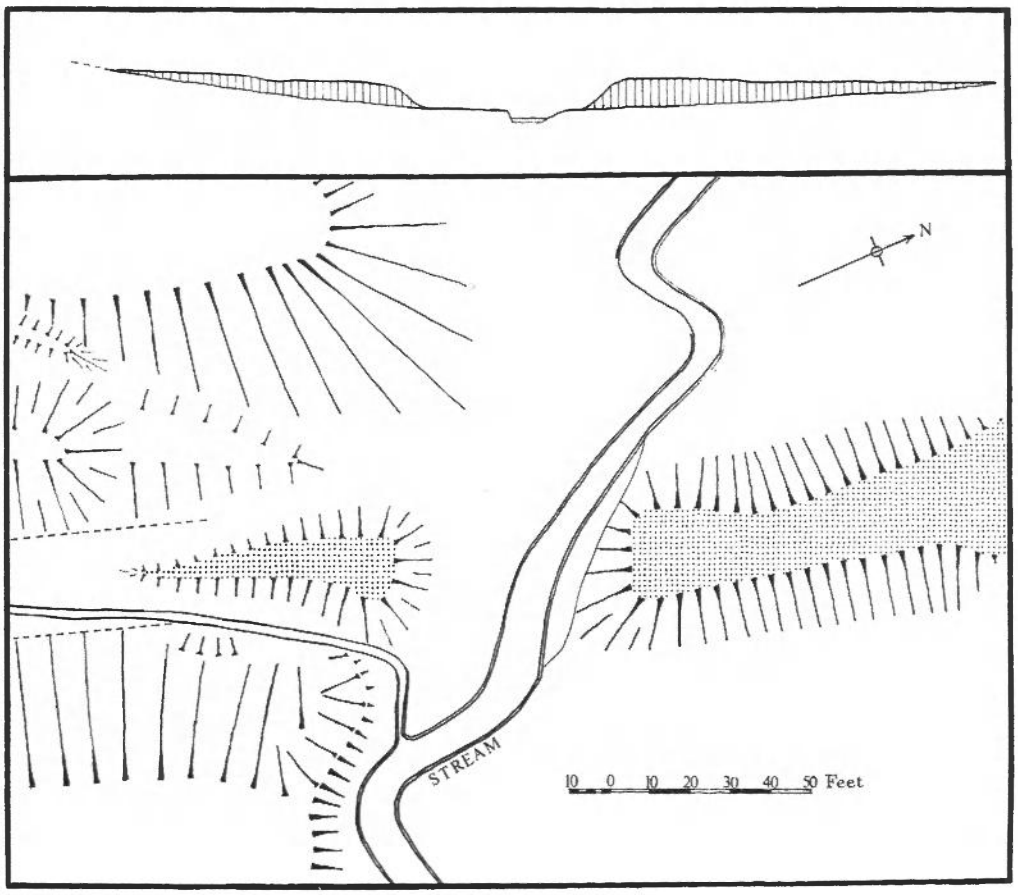


Fig. 3. Bridge abutments at Stockley Gill

Gill, however, the Roman engineers had to make concessions to a major valley, and the road descends almost to the level of the stream.

On both sides the road ran up on to a considerable ramp or causeway, which stopped abruptly at the edges of the stream to form abutments 8–9 ft. high. The southern abutment was 36 ft. wide with a flat top 16 ft. wide; the

[1] MacLauchlan, *op. cit.* (1852), 8. The abutment is here described as having 'the appearance of a tumulus'.

northern was 44 ft. wide with a flat top 22 ft. wide; they are thus wider on top than the eastern abutment at Hunwick Gill, but again not as wide as the normal agger. These large abutments consisted mainly of earth and cobbles and were 60 ft. apart[1]. No indication of a stone structure was found.

THE EVIDENCE FOR BRIDGES IN ROMAN BRITAIN

There may have been pre-Roman bridges in Britain, but no clear physical or documentary evidence for them survives. The bridge over the Thames referred to by Dio Cassius may have been a British construction, but it is far more likely to have been a Roman military bridge built by Aulus Plautius during the invasion or pacification[2]. In the pre-Roman period, when roads were generally ill-defined tracks, rivers and streams were usually forded. Occasionally, however, plank bridges or stone ones of the 'Clapper' type seen on Dartmoor[3] may have been constructed, and even sophisticated timber bridges such as are described by Caesar in Gaul[4].

Bridges and aqueducts are looked upon as providing some of the finest examples of Roman structural engineering. The continent can boast several complete structures and many substantial fragments[5]; in Britain, although many bridges must have existed, we have little to show at the present day. A considerable body of evidence does, however, survive and is here presented in a classified form (pp. 151-164).

Before proceeding further it is necessary to distinguish between the various types of evidence. This falls into four main classes[6] which will now be described.

Class A:

Sites where bridges are assumed to have existed from geographical and other considerations, but where no physical traces have been found and recorded. One can assume or deduce the existence of a bridge from the importance of the routeway, combined with the character of the river (its width, depth, and force). If the crossing is commanded by a major settlement, whether fort, fortress or civil town, the chances of there having been a bridge are correspondingly increased. Sometimes the exact spot where the bridge should exist is known from the road-system; sometimes only the rough whereabouts are known. Clearly Class A is a numerous one, and no attempt will be made here to provide an exhaustive list. The possibility or otherwise of a Roman bridge is best appreciated by local archaeologists with a good grasp of topography. No doubt certain sites of this sort such as London and Chester can be quoted as definitely having bridges, but there will remain many sites where bridges are only probabilities.

Class B:

Sites where physical evidence for a bridge exists or has existed, but where there is no certainty that it is Roman. Often this evidence has now disappeared, and one has to rely on

1 As this valley is not so steep as Hunwick Gill and Willington South Dene, the abutments are less liable to erosion. Excavation might be profitable, but tree roots are a special hazard.

2 Dio Cassius, *Roman History*, LX, 20. See also *London in Roman Times* (1946), 19.

3 The existing Clapper bridges are thought to date from the Middle Ages. See W. G. Hoskins, *Devon* (1954), Pl. 25. The principle, however, could be much older: rough dry-stone piers are joined by massive granite slabs. See also *Dartmoor*, National Park Guide (1962), 29.

4 Caesar, *De Bello Gallico*, VII, 11; VII, 58; VIII, 27.

5 H. Stuart Jones, *Companion to Roman History* (1912), 76–84; F. J. Wiseman, *Roman Spain* (1956), 151, 153, 157, 178; O. Brogan, *Roman Gaul* (1953), 32–34; A. Grenier, *Archeologie Gallo-Romaine*, ii, 185; Dr. Gündel, *Germania*, VI (1922), 68.

6 A much more detailed classification is doubtless possible, but hardly justifiable in the light of existing knowledge. The proposed classification is merely a suggested method of marshalling the existing evidence, so that it can be subjected to critical analysis.

the descriptions of earlier antiquaries. Such descriptions and interpretations vary enormously in quality and authority, and care must always be exercised in their use. Since Camden's day many structures have been described as 'Roman' bridges when they are patently medieval or even later — bridges with pointed and ribbed arches, for instance[1]. When therefore one is relying on the record of an early antiquary, it is useful to have corroborative evidence, such as the known Roman road-system or settlement pattern. If such corroborative evidence exists, then a Roman date is a strong possibility, and the site will be classified B1. If, on the other hand, there is no such corroborative evidence, then the possibility of a Roman date is far more remote, and the site will be classified B2. Class B evidence, therefore, leaves some doubt as to the date; B1 and B2 merely reflect the degree of doubt. Remains of this class are usually fragmentary, such as piles and odd lumps of masonry, and they have no certain Roman characteristics (though no characteristics which are inconsistent with a Roman origin). A warning must be made here about wooden piles. It is the disposition of the piles which betrays the former existence of a bridge — if they are grouped in the river bed, they represent the foundations of bridge-piers, but if they are in lines across the river, they probably represent the revetment of a paved ford (see below, Littleborough, p. 149). It is not always possible to say whether the remains are of a bridge, ford or causeway; in these cases the alternatives are clearly stated in the following lists.

Confusion may arise where there have been several bridges of different dates, and it is not obvious which remains, if any, are Roman. Cambridge is a good example of this problem (see p. 153); none of the descriptions of the finds is good enough to make certain the dating of the various fragments. It must also be remembered that the remains of a medieval bridge may have been recorded even on a known Roman road, and that only a ford existed in the Roman period[2].

If the approach roads are completely unknown, it is possible that a definitely Roman bridge may be relegated to Class B2, especially if the remains were very fragmentary. (The discovery of a bridge may, however, enable the course of a road to be confirmed.)

Class C:

Sites where remains exist or have existed and there is reasonable certainty that they are Roman. In this class, the remains are usually substantial and have recognizable Roman characteristics such as cramps and tooling-marks. The road system is generally not in doubt and the remains, being substantial, are well-recorded even if they have now disappeared. Corbridge and Chesters (see pp. 157-8) provide the best examples of this class.

Class D:

Sites where a bridge is implied in a Latin place-name or in documentary evidence. Such evidence is really a facet of Class A, unless corroborated by evidence of another sort. Sites of Class D can, therefore, coincide with any of the three other classes. Newcastle (Pons Aelius), for example, is classified C/D, as the place-name can be identified with the recorded relics from the bed of the River Tyne (see pp. 158, 164).

Usually, it is quite justifiable to make assumptions on the basis of the present-day character of the river, particularly its width, depth and force. It must be remembered, however, that in most cases, width and depth have been changed since Roman times by embanking and dredging. In Roman times,

1 Examples of such erroneous references: Lancs., Wyersdale, Street Bridge; *Lancs. & Ches. A. S. Trans.*, X, 252 (a stone abutment of un-Roman masonry off the Roman line). Leics., Croft, Langham Bridges; Throsby, *Select Views of Leics.* (1790–2), II, 519 (a series of stone arches of un-Roman masonry). Sussex, Bramber; *Sussex Arch. Coll.*, II, 63, 73 (19 arches, depressed, slightly pointed and ribbed). Yorks. W.R., Tadcaster; C. R. Smith, *Proc. S.A.*, II, 187 (an arched structure well off the Roman line). Cumb., Lanercost; *Cumb. & West. Trans.*, *n.s.* XXX, 122 (bridge originally thought Roman shown to be medieval, medieval masonry). Yorks. W.R., Black Castle Clough; *Trans. Rochdale Lit. & Sci. Soc.*, 18, 83 (a pack-horse or drover's bridge on the Roman road; un-Roman dry-stone masonry, parapet associated with low walls to prevent beasts straying).

2 *e.g.* At East Riddlesden, Yorks. W.R., there was a wood and stone bridge, 4 ft. wide and at least 30 ft. long across the R. Aire. Although apparently on the Roman line, it is probably 16th or 17th-century in date; *Bradford Antiquary*, 9, *n.s.* 7, 191.

rivers were generally wider and shallower, particularly where they were flowing slowly through flood plains. There is no constant ratio between the new and old measurement, but Corbridge may be quoted as an example; the width in Roman times was half as much again as the width today. Occasionally, also, the course of a river has changed considerably because of erosion, silting or meandering. Thus it is often difficult to pin-point a river-crossing especially where the course of the road is not certain and there are several possible lines.

The physical evidence is mostly fragmentary and rarely stratigraphic; hence one can only say, even with Class C, that there is 'reasonable certainty' of a Roman date for a particular structure. For example, the finding of rusticated and squared stones in the River Wear, near Binchester, is not absolutely conclusive evidence for a Roman bridge. They could be explained as the remains of any early 19th-century bridge, or of nearby pit-buildings of the same date, when masonry could be very 'Roman' in character. But, as there are no records of any such structures in the vicinity, and as the stones were found exactly where Dere Street is known to have crossed the river, circumstances point to a Roman date. It is perhaps better to describe such evidence as 'safe' rather than 'conclusive'. The earthen abutments of small timber bridges fall mainly into Class C, as they are usually quite safe evidence, particularly when the exact course of the Roman road is known.

Bridging points are obviously very important in a system of communications. This is often corroborated by the convergence of roads on a bridge (*e.g.* Derby (Little Chesters), see p. 152), and the existence of a nearby fort or civil settlement. (When such a fort or settlement exists, it is mentioned in the list of sites given below.) Towers were sometimes built at the ends of bridges for defensive purposes[1]; Chesters, for example, has a tower on the eastern abutment (see p. 157).

It is to be hoped that future field-workers will record bridge-sites more adequately and less ambiguously than has been done in the past. Most discoveries will come from sites where modern development has not taken place, but it should not be forgotten that evidence can sometimes be found buried under modern roads and bridges. Construction work should be watched, especially when on a known Roman line[2]. The finding of what appears to be a Roman bridge-site may also be a valuable link in the chain of evidence for a particular road[3]. Documentary evidence for Roman bridges may be found in, for example, early Saxon charters. At Quaking Bridge, Wilts., a reference to 'Weala Brucge' (Britons' Bridge) strongly suggests a Roman structure[4].

The dating of bridges is difficult, as stratification and associated finds rarely exist. The bridges on Hadrian's Wall are easier to date than most because they form part of the larger, dated system. Pons Aelius is of course securely

[1] See C. Cichorius, *Die Traianssaüle*, 2, Pl. LXXII, for a large bridge with stone piers and towers. For coin evidence see Mattingly and Sydenham, IV, 198. Sometimes these towers were decorative rather than functional (*cf.* the triumphal arch on the bridge of Alcantara).

[2] *e.g.* the reconstruction of Teign Bridge, Devon, in 1815 enabled P. Taylor to record four superimposed structures. *Archaeologia*, XIX, 308.

[3] There is a danger here of using circular argument; *i.e.* the bridge could be used as evidence for a Roman road, and the road as evidence for a Roman bridge.

[4] I. D. Margary, *Roman Roads in Britain*, I, 121.

dated to Hadrian's reign by its name, but even this bridge may have been substantially rebuilt at a later date. Occasionally when a bridge and ford exist side by side, the bridge is obviously later as it caused a slight diversion from the original line of the road (see p. 162, Oxon., Asthally). Masonry details are usually too fragmentary for dating purposes.

There is little direct evidence for the history of bridges in the post-Roman period. Probably many were deliberately destroyed, mainly by populations on the defensive, and others may have gradually collapsed through lack of maintenance. Roads would have remained usable for some time without repair, but bridges, especially wooden ones, would have needed constant attention. With no central organization and direction, and the frequent avoidance of Roman roads by Anglo-Saxon settlers, there would be no interest in the maintenance of bridges on through Roman roads, and those not destroyed would have soon collapsed. It may be possible on some bridge-sites to see the diversions, probably upstream, that were created as a result of such collapse. At Acton Burnell, Shropshire, for example, an oblique hollow-way descends to a ford upstream from the bridge-site, and is probably the route traffic was forced to take after the Roman bridge had collapsed. Later, one of the two Roman bridge-sites was reconditioned for a narrow pack-horse track (p. 162).

Types of Roman Bridges

Structurally, Roman bridges can be divided into two main types: those built of stone (the piers, if not the superstructure), and those built of wood. The stone structures are generally the major bridges spanning the larger rivers, while timber bridges cross smaller streams and gills. This generalization must be qualified, however, as other considerations obtain than the mere width of the crossing. It is certain, for instance, that the bridges built by the army during the conquest and pacification were of timber — whatever the width of the crossing — for the sake of speed and destructability. This sort of bridge was undoubtedly rare, but there might be examples in Britain[1]. After pacification, when time and labour were available, bridges originally of timber were perhaps rebuilt in stone, and gradually new bridges of both timber and stone must have replaced original fords.

A third type of Roman bridge must be mentioned here — the bridge of boats[2]. There are no remains of any such bridges in Britain, though they may have existed, particularly on wide, tidal estuaries. C. Oman thought that a coin of Caracalla issued in 209 commemorated the building of a pontoon bridge over the River Forth during the Caledonian campaign of Severus. The coin shows a wooden bridge with criss-cross parapets, resting on three boats and with sloping approaches of timber at each end[3].

1 A possible but doubtful example is a bridge over the River Tay in Scotland (see below p. 154). See Caesar, *De Bello Gallico*, IV, 17, for construction of bridge over R. Rhine; also *ibid.*, I, 7, for the deliberate destruction of a timber bridge.

2 O. Brogan, *Roman Gaul* (1953), 32; description of pontoon bridge at Arles. Arrian (*Anab.*, V, 7) describes the construction of a pontoon bridge.

3 *Numismatic Chron.* (1931), 137. Oman calls it a bridge of trestles, mistaking the criss-cross parapet for trestles under the roadway. This convention of showing the parapet and the upper half of human figures, crossing the bridge is well known from Trajan's Column. The number of boats on the coin is not, of course, to be taken literally.

Generally Roman bridges are not wide. The roadways of eight measured stone bridges in Britain vary from 12 ft. (Chesters I) to 30 ft. (Willowford II), the average being 20 ft. The timber bridges were probably on average narrower still: the bridge at Asthally for instance was 10 ft. wide. From the vast majority of sites and pictorial representations it appears that Roman bridges were flat. Coins occasionally show hump-backed bridges, and a few such bridges are reputed to exist still in Gaul, but even so the type must have been rare[1].

Permanent stone bridges seem from their distribution to be characteristic of major trunk routes; they span rivers usually of 60 ft. or more. This does not mean that the small timber bridges are only characteristic of minor roads; they are found commonly on major roads and in particular on the vital military routes of northern England and Scotland. The frequent occurrence of timber bridges in the North is partly the result of the harder geology and undeveloped nature of the region, but it must also represent a characteristic of military roads in difficult country. Small timber bridges were probably quite numerous on minor roads over the whole country, but with the preponderance again in the Highland Zone.

Construction of stone bridges

Although the remains of several stone bridges have been found in this country, evidence for the use of stone arches is comparatively rare. It is generally assumed from this negative evidence that most stone bridges in Britain had timber superstructures. On the whole this assumption seems justified, although the remains are usually fragmentary (never more than odd voussoirs or springers), and chance may have robbed us of positive evidence. Neither of the two major survivals in Britain, at Corbridge and Chesters, has produced voussoirs; these are known from only three British sites and only Willowford I has produced springers. Even where voussoirs exist, they may only have come from flood arches through the piers, and not from the superstructure.

The timber superstructure of stone bridges probably consisted of a flat wooden roadway with a parapet supported by criss-cross bracing. To judge from Trajan's bridge over the Danube illustrated on his Column, the roadway between the piers was supported by flat segmental arches of timber, heavily braced. Undoubtedly where the span was not too great long squared timbers supported the roadway without an arch. At Wallasey, Cheshire, where there seems to have been a complete Roman bridge, 100 ft. long, a flat wooden causeway with a criss-cross parapet rested on two stone piers. Each span of the superstructure was supported by four compound bearers, 33 ft. long, each consisting of three well squared beams. These bearers carried transverse rafters. On the edges of the road-way mortice holes, some vertical, some oblique, showed that the bridge had cross-railed parapets. From Pons Aelius a wooden

1 A sestertius of Trajan for example shows a single-arched, hump-backed bridge; see Mattingly and Sydenham, II, 239, 284. This may illustrate the earliest bridge in Rome, the Pons Sublicius — a timber structure. For the bridges in Gaul, see Pobe and Roubier, *The Art of Roman Gaul* (1961), Pls. 90 and 91: on these two examples the roadway on each side of the bridge rises to a sharp central apex, giving the bridge a pointed rather than hump-backed appearance. The Guadiana Bridge at Merida is slightly pointed (I. A. Richmond, *Arch. J.*, LXXXVII (1930), 99).

fragment has survived which may have been part of the superstructure (see below p. 158).

Stone bridges were usually accompanied by abutments of solid stone, or earthen ones encased in stone. The usual plan of these was splayed, that is, three faces with obtuse angles between them.

On the stone bridges cut-waters were probably regular features, at least on the upstream side; they were double in tidal rivers. (The bridge at Wroxeter was exceptional in apparently having timber cut-waters, probably an afterthought, consisting of piles and vertical planking backed by clay[1].) The stone piers, which rested on bed-rock or on piles driven into the river-bed, were usually built of well-cut ashlar blocks of various sizes, laid in their natural bedding plane, and sometimes with decorated or rusticated surfaces[2]. Vents and arched openings through the piers occur on continental bridges, and may well have existed in Britain. The bridge at Corbridge for example blocked the River Tyne by more than half its width, causing the water to pond back upstream especially when in spate; it is possible therefore that this bridge was furnished with flood-arches through its piers.

Piles, where they occur in sufficient quantity, are in groups corresponding to the sites of piers. Measured examples have lengths of from 6 to 11 ft. The appearance of the iron shoes which protected the ends of the piles is known from foreign examples; a possible example, now lost, came from Pons Aelius and others may well survive unrecognised in Museum collections[3]. Occasionally the remains of a timber framework, on which the stone piers rested, are still found. These frameworks, or rafts, consisted of large wooden baulks resting on piles, as a foundation for the stonework. The best example is Pons Aelius.

The construction of Roman bridges must have involved principles still in use today. The pier and its foundations must have been laid inside a wooden caisson. The piles were presumably forced into the river-bed by heavy pile-drivers. The latter were probably metal weights travelling between guide-rails, falling by gravity and raised by pulleys and winches.

The use of iron cramps[4] to bind masonry is well-known on British sites, notably Chesters and Corbridge; these are iron strips set in lead in recesses cut into the surfaces of adjacent stones. The recesses were normally dovetailed in shape, although at Chesters the cramps were several feet long running in long grooves across several stones, and are usually termed 'tie-rods'. Lewis-holes for lifting the heavy blocks also occur[5].

These details of the construction of stone bridges depend to some extent on the substantial remains at Corbridge and Chesters, both part of the Hadrianic Wall system, and at Summerston, which was part of the Antonine Wall system. Our knowledge of bridge construction in Britain may therefore be rather

1 *Trans. Shrop. Arch. Soc.*, 4th ser., XI, 304.
2 See below, for Binchester, Summerston and Chesters.
3 Some German examples are to be found in the Pitt-Rivers Museum, Farnham, Dorset.
4 The use of cramps to bind ordinary masonry is not paralleled again in Britain until the 18th and 19th centuries. In the Middle Ages cramps, rods and pins were used, but apparently in decorative and overhanging features. See L. F. Salzman, *Building in England* (1952), 286.
5 *e.g.* Shropshire, Wroxeter. See p. 159.

one-sided, and too dependent on these special frontier examples. It is certain, however, that the majority of Roman bridges belong to the military zone of the North and its arterial roads; this is partly the result of geography and partly of military requirements and policy.

Timber Bridges

The sites of small timber bridges have been noticed by several field-workers[1] although relics of the structures themselves are rarely found. Fortunately, however, these bridges were commonly accompanied by causeways and abutments of the Hunwick and Stockley Gill type, which often survive as the only, but certain, indication of how the crossing was effected. O. G. S. Crawford has described these abutments thus: 'When the Roman road comes to a stream, you will find as a rule nothing but the occasional remains of an earthen ramp, once the support of a wooden bridge.'[2] These timber bridges generally spanned streams and gills which are not wider than 50–60 ft.

Where these abutments existed, there is a good chance of their survival. Even in the most highly cultivated areas there is normally a strip of virgin land along the edges of streams, where such earthworks may survive. In addition, their chance of survival is better in the Highland Zone, where modern development is relatively less widespread. The field-worker must however satisfy himself that false abutments have not been created by stream erosion from a causeway or high agger. The earthen abutments of timber bridges were sometimes revetted with a stone wall, particularly the face against the stream. (See below p. 163, Westmorland, Low Borrow Bridge.)

As with stone bridges, there is a distinct and understandable preponderance of northern sites, particularly on the main military routes. Some of these timber bridges must have been erected when the road was first laid out (*e.g.* Hunwick Gill), as the road could have negotiated the obstacles in no other way. Others undoubtedly replaced earlier fords. Many bridge abutments must await recognition in the Highland Zone; very few, for example, have been recorded in Wales and the South-West.

Examples of timber bridges and their abutments have been found in the Lowland Zone, but they were probably never so numerous and were generally secondary to fords. In the only two cases where abutments have been excavated, both in the Lowland Zone, the bridges succeeded earlier fords[3].

The scale of the causeways and abutments varies considerably according to the topography. Sometimes the bridge may have been quite low over the water (as at Denver, where the surrounding ground level was low in relation to the stream), and sometimes 20 ft. or more above the water (as at Hunwick Gill, where the road suddenly came to a steep-sided gill). Bridges may also have been approached by cuttings through the valley sides[4].

[1] Principally: I. D. Margary, *Roman Roads in Britain* (1955, 1957) and *Roman Ways in the Weald* (1948); O. G. S. Crawford, *Archaeology in the Field* (1952); S. N. Miller, *The Roman Occupation of S.W. Scotland* (1952).
[2] O. G. S. Crawford, *Archaeology in the Field* (1952), 57.
[3] See pp. 161–2, Norfolk, Denver; Oxon., Asthally.
[4] *Cumb. & West. Trans.*, XXXVI, *n.s.* 182; LVI, *n.s.* 37.

Occasionally a timber bridge may be inferred, as at Willington South Dene, from the behaviour of the road on each side of the stream or gill. Where the road leads to the very lip of the water or scarp and resumes on the same alignment on the other side (there being no room for a zig-zagging course), it may reasonably be inferred that a bridge existed without the presence of formal abutments[1]. In these cases, the field-worker must satisfy himself that the course of the stream is the same as in Roman times.

At Denver, where the only structural remains of an actual bridge survive, two post-holes were found at the edge of one of the earthen abutments at the point where the end of the bridge must have rested. In spite of the inevitable erosion of abutments, excavation at other sites might well produce further evidence of bridge structure, for the timbers at Denver were substantial and set over 2 ft. into the ground.

The appearance of the timber bridges is well known from representations on Trajan's Column[2]. Sometimes merely the profile is portrayed, but sometimes the roadway and far parapet are also introduced. The main features of such bridges seem to be stout upright timbers, cross bracing, a flat roadway and criss-cross parapets. Occasionally an upright was continued above the parapet-rail as a decorative feature. Pegs (or nails) are shown at the joints and intersections of the timbers.

Other types of river crossings

Bridges are not, of course, the only means of crossing water and some mention must be made of other methods employed by the Romans in Britain. The majority of rivers and streams were, presumably, crossed by means of fords, examples of which exist from all over the country. It seems certain that these fords were deliberately metalled, usually by a stone pavement. At Iden Green, Kent, was recorded a pavement of large, roughly squared stone blocks across a small stream.[3] At Littleborough, however, a much more elaborate structure was built to cross the wide, swiftly flowing River Trent; the paved ford had a timber kerb on each side, kept in place by a row of piles[4].

Fieldwork in Cumberland[5] indicates that many Roman cuttings may await recognition; most of these were probably connected with fords, but a few low-level bridges and causeways could have existed. In such cases, the material for the abutments and causeways would come conveniently from the cuttings.

At Holtye, Sussex, a watersplash is recorded. The stream from a nearby spring flowed diagonally across the London-Lewes road in an irregular shallow bed. The feature was said to be original, because the road widened at that point, and wheel-ruts were traceable through it[6].

1 Mr. R. R. Clarke postulated the existence of several bridges on the Colchester to Caistor-next-Norwich road in this way: *East Anglia* (1960), 117. See below, p. 162.

2 See Cichorius, I, Pls. VIII, XII–XIV, XVI, 2, Pls. LXVII, LXXIV. Pl. XV shows the construction of a timber bridge; cross-struts are being fixed by one soldier, while his companion sits working astride a beam.

3 *V. C. H., Kent*, III (1932), 139.

4 *Arch. J.*, XLIII, 11. Here, one might have expected a bridge as well as a ford.

5 *Cumb. & West. Trans.*, XXXVI, *n.s.*, 182; LVI, *n.s.*, 37.

6 I. D. Margary, *Roman Ways in the Weald*, 159.

Another method for crossing small streams and gulleys was to build a solid agger, with the probable provision of a pipe or culvert for the stream[1].

Proper causeways were occasionally built to cross streams and flat marshy areas. These structures could be quite elaborate. At Street, Somerset, the causeway was based on wooden sleepers of alder, oak and fir, 12 ft. to 14 ft. long with vertical piles. Over these was a thin layer of concrete on which were laid side timbers forming a trough, 12 ft. wide, 30–33 ins. deep, filled with stones to form the roadway. On each side were sloping banks of brushwood and stone, so that the whole structure was 72 ft. wide[2]. At Strood, Rochester, Kent, the causeway of layers of flints, chalk, pebble-gravel and Kentish Rag rested on piles and a framework of timber 'cells'; the width was 14 ft.[3]. At Lincoln, there was a causeway of concrete consolidated by six rows of piles 12 ft. apart, possibly mounting a ramped bridge approach[4]. Temporary wooden causeways or *ponts de fascines*, such as were found at La Bréche (Oise), may have been employed in Britain during the military campaigns of the 1st century[5]. These consisted of rectangular timber units (*travees*) laid end to end, resting on piles and smaller stakes.

At very wide estuaries, for example at the Humber, Severn and the Wash, ferries were used. These were wide, deep crossings where bridges and fords were impracticable. The crossings are well attested by the road system on each side[6].

It must be remembered that Dere Street, which prompted this paper, was one of the most important roads in the province. As such, it was not typical of the vast majority of roads, for one would naturally expect a higher standard of engineering (and, therefore, more bridges) than on a normal military or civil road. The results of the survey do suggest, however, that despite the exceptional nature of Dere Street, many bridging-points, particularly those with earthen abutments, must still await recognition on other roads. The literature on Roman roads in Britain contains little detailed reference to water crossings[7]. The courses of roads have been traced with exemplary accuracy, but the rivers and streams have not been looked upon as problems of engineering. Consequently earthworks as obtrusive as at Hunwick Gill have been consistently ignored. This article is offered in the belief that much evidence still survives to be recognised, and in the hope that future field-work will put the problem of water-crossings in its rightful place in the study of Roman roads in Britain.

1 *e.g.* near Hunwick, Co. Durham, at NZ 19863217, where Dere Street crosses a gully 10 – 15 ft. wide and 6 – 8 ft. deep by a solid causeway — R.C.H.M. (Eng.), unpublished. See also Margary, *Roman Ways in the Weald*, 52: Crevatt's Wood, Sussex, culvert under Stane Street.

2 I. D. Margary, *Roman Roads in Britain*, I, 115.

3 T. Codrington, *Roman Roads in Britain*, 44.

4 I. A. Richmond, *Arch. J.*, CIII (1946), 45.

5 G. Matherat, *Revue Archeologique*, Ser. 6e, IX, 38. See Cichorius, II, Pl. XCVII for an illustration of these units.

6 See *Bristol & Gloucs. A. S. Trans.*, III, 873 (Severn); *Antiquity*, VI, 342 (Wash).

7 The detailed field-work of I. D. Margary, published in *Roman Ways in the Weald* (1948), is a notable exception.

GENERAL INDEX OF BRIDGE SITES BY COUNTIES

After each site, the class is indicated (*see* classified list of sites *below*); 't' symbolises timber and 's' stone. Where a bridge joins two counties it is listed under both.

CLASSIFIED LIST OF BRIDGE SITES

Method of classification:— the sites of Roman bridges in Britain are listed according to the classification, A, B, C or D, described on pp. 142–3. Class C is sub-divided into stone bridges and timber bridges. In classes A, B and C, the sites are presented alphabetically by county, with the nearest appropriate place-name. (Where a bridge joins two counties both are mentioned in alphabetical order.) In Class D, the Latin place-names are listed alphabetically, regardless of county.

Abbreviations used in the list.

Margary I. D. Margary, *Roman Roads in Britain*, 2 vols., 1955 and 1957.
Miller S. N. Miller, *Roman Occupation of S.W. Scotland* (1952).

CLASS A (See p. 142)

N.B.—This list is not intended as complete; it consists of those sites where the likelihood of a Roman bridge has, rightly or wrongly, been asserted.

CHESHIRE: Chester SJ 407657 R. *Dee*
Information from F. H. Thompson: although no tangible evidence exists, the presence of a bridge outside the legionary fortress cannot be doubted; see *Margary*, II, 30, for same opinion.
Roads: Chester to Holt, Caer Gai and Caerhun; three roads converge on the W. end of the bridge.

CUMBERLAND: Carlisle Approx. NY 400563 R. *Eden*
R. Hogg, *Cumb. & West. Trans., n.s.*, LII, 131: probable site of an Agricolan bridge across original channel of the Eden to the S. of the present course; probable site about 60 yds. W. of arched causeway.
Roads: Carlisle — Scotland; Carlisle — Corbridge (Stanegate).
Comment. At such a date, during military campaigns, such bridges were probably entirely of wood.

DERBYSHIRE: Derby SK 352377 R. *Derwent*
Margary, II, 39: one mile N. of the centre of modern Derby, by the fort of Little Chesters, the Derwent was probably bridged. The crossing was an important focus of routes converging from the west.
Roads: Little Chesters to Wall, Rocester and Buxton.

LANARKSHIRE: Roberton Approx. NS 9428 R. *Clyde*
Margary, II, 197, 199: The road doubtless crossed the Clyde by a bridge.
Road: Roberton — Carstairs.

LANCASHIRE: Lancaster SD 478623 R. *Lune*
W. T. Watkins, *Roman Lancs.* (1883), 192: a Roman bridge must have existed. No vestiges ever recorded. Traces of medieval bridge still visible at low water.
Road: Lancaster north towards Morecambe Bay (possible line).

LINCOLNSHIRE: Lincoln SK 974712 R. *Witham*
I. A. Richmond, *Arch. J.*, CIII (1946), 45: probable site of a long bridge 'with flood arches in ramped approaches'. A substantial concrete causeway, consolidated with rows of wooden piles, has been found approaching the crossing.
Road: Lincoln — Leicester. (Fosse Way.)

LONDON TQ 328804 R. *Thames*
R.C.H.M. (Eng.), *Roman London*, 31: reasonable certainty of a Roman bridge. See also *London in Roman Times*, 19, for same opinion.
Roads: London to Chichester and Canterbury.

MONMOUTHSHIRE: Caerleon ST 343904 R. *Usk*
V. E. & A. H. Nash-Williams, *Catalogue of Roman stones from Caerleon* (1935), 8: a Roman bridge must have existed outside the legionary fortress.
Road: Caerleon — Caerwent.

NORFOLK: Caistor-next-Norwich TG 227035 R. *Tas*
R. R. Clarke, *Norfolk Arch.*, 26, 121: '. . . a paved ford or more likely a timber bridge'. See also *Margary*, I, 237 for same opinion.
Road: Baylham — Caistor.

PERTHSHIRE: Innerpeffray NN 902182 R. *Earn*
O. G. S. Crawford, *Roman Scotland* (1949), 51: likely place for a bridge, near fort of Strageath. See also *Margary*, II, 221.
Road: Ardoch — Bertha.

SHROPSHIRE: Wroxeter SJ 562083 R. *Severn*
Outside the town of Uriconium, a bridge must have existed, probably cutting across the southern tip of the island. The road is known on each side. The bridge pier mentioned by J. Morris, *Trans. Shrops. Arch. Soc.*, 4th Series, XI (1927–8), 304, cannot belong to a Severn bridge (see p. 159).
Road: Wroxeter — Leintwardine.

YORKSHIRE: Catterick SE 225993 R. *Swale*
Information from J. Wacher: ford and bridge both likely. Northern abutment should survive, as the river has shifted to the south. Crossing overlooked by fort and town.
Road: Dere Street.

CLASS B (See p. 142)

B1 (*Sites with corroborative evidence*)

CAMBRIDGESHIRE: Cambridge TL 447589 R. *Grant*
Cambs. Antiq. Soc., O.P. XX, 26; 'Mr. Essex says that when he was superintending the excavations for the foundation of the Great Bridge (near Magdalen College) in 1754 he saw those of the ancient stone bridge over the R. Grant built on piles'. Two small round arches were conjectured from voussoirs. A ford also showed as a firm pavement of pebbles. In 1823 a series of wooden bridges was noted when the bridge of 1754 was replaced. The southern abutment was exposed: masonry laid on two courses of timber (laid across each other) each about 6½ – 7 ins. thick and 13 – 14 ins. wide. No piles visible. A causeway on piles and squared beams led to this crossing.
Comment. It is possible that the abutment was Roman, but certain identification is impossible because of the inadequate description. The site is certainly on or near the Roman line. The voussoirs seem more likely to be medieval. A ford may also have existed on the site before the bridge and/or contemporary with it. The crossing is commanded by the town of Cambridge. Bridge attested in Latin name (see Class D p. 164).

DURHAM: Ebchester NZ 101554 R. *Derwent*
Wm. Hutchinson, *Hist. of Durham* (1807), Vol. II, 547: remains of two piers 'supposed by some to be part of a Roman bridge'. H. MacLauchlan (1850–1) saw nothing here.
Road: Dere Street (the exact course in the valley is uncertain). The crossing is commanded by the fort of Ebchester.

HAMPSHIRE: Bossington SU 338306 R. *Test*
Hoare, *Ancient Wilts.*, II, Roman Æra, 61: piles of a bridge.
Road: Winchester — Old Sarum.
Comment. This site, either a bridge or a ford, is on or near the Roman line.

HEREFORDSHIRE: Kenchester SO 442412 R. *Wye*
Woolhope Nat. F. C., 1893–4, 56: 14 massive piles on the Canon Bridge side of the river 'in tolerably close arrangement' extending 15 ft. from the bank. Some piles were vertical, some oblique. Two measured examples were 12 ins. square. A few yards further upstream were large timber baulks lying horizontally like steps. No other piles observed.
Road: Kenchester — Abergavenny.
Comment. These piles may well be the uprights and oblique struts of a Roman timber bridge (*cf.* Cichorius, pls. XIII and LXXIV).

PERTHSHIRE: Bertha NO 100270 R. *Tay*

O. G. S. Crawford, *Roman Scotland* (1949), 60: remains of a wooden bridge were still visible in 1795. Large oak planks 6 – 8 ins. in diam. fastened by long skairs, coarsely jointed, surrounded by clasps of iron. *Margary*, II, 222: crossing by bridge.

Road: Bertha — Cardean. The crossing is commanded by the fort of Bertha.

Comment. It is uncertain what these remains are; possibly a protective framework, or a piece of the actual roadway, but not necessarily a bridge.

ROXBURGHSHIRE: Newstead NT 568347 R. *Tweed*

A. Milne, *A Description of the Parish of Melrose* (1769), 6: '. . . great deal of fine stones are dug out of the arches of the bridge when the water is low.' R.C.A.M. (Scot.), *Roxburghshire*, Vol. II, 469: ford likely as well as bridge.

Road: Dere Street. The crossing is commanded by the fort of Newstead.

Comment: The mention of arches is likely to be pure supposition; there is no record of voussoirs. The word 'arches' is often used loosely to describe the water-passage between piers.

YORKSHIRE: Aldborough SE 402674 R. *Ure*

Drake, *Eboracum* (1736), 24: reference to a large beam, solid and black taken from the river. Gough's *Camden*, 58, testifies to the survival of six piles till 1789.

Road: York — Catterick (Dere Street). The crossing is commanded by the town of Aldborough.

B2 (*Sites without corroborative evidence*)

DEVONSHIRE: Teignbridge SX 858735 R. *Teign*

P. T. Taylor, *Archaeologia*, XIX, 308: four bridges discovered in 1815 on top of one another. The earliest, suggested as Roman, was 'of fine white free-stone ashler (*sic*)', laid on wooden platforms 22 ft. 5 ins. below the modern surface. Two piers with double cut-waters were found, each 27 ft. long between the points of the cut-waters.

Comment. The road Exeter – Teignbridge – S. Devon is now accepted as a probable Roman line (see O.S. map, Roman Britain, 3rd edn.), and at such an important crossing a Roman bridge may well have existed. It is not, however, proven that any of the bridges seen by Taylor is Roman. In view of rapid silting on the site, the survival nearby of an arch which Taylor connects with the 'white' bridge, and the possibility that the remains represented only three bridges, the earliest recorded bridge may be Norman.

KENT: Rochester TQ 741688 R. *Medway*

Arch. Cantiana, XXXV, 130: description of pier found in 1850. Mass of Kentish ragstone 13 – 25 ft. below present river bed. Timber of considerable dimensions, beech, oak and elm. Some fragments of iron pile-shoes. *V. C. H. Kent*, Vol. III, 85: medieval bridge of 1392 was preceded by a bridge with stone piers and wooden superstructure 10 ft. wide. 10 openings, 9 piers 43 ft. apart. Site: 60 yds. S.W. of present bridge. But north of the present bridge there were also 'solid foundations of an ancient work' found in the 19th century.

Road: Canterbury — London. The crossing is commanded by the town of Rochester.

Comment. A Roman bridge existed across this wide river; it is not possible to specify the exact site, but the northern site seems the more probable; the openings of the southern bridge are wide for a Roman structure. Bridge attested in Latin name (see Class D p. 163).

MONMOUTHSHIRE: Chepstow Approx. SO 5012 R. *Wye*

J. Ward, *Romano-British Buildings and Earthworks*, 233: mention of timber pier with two cut-waters. The road system of the area is not certain. The crossing was commanded by the settlement of Monmouth.

NORTHUMBERLAND: Brinkburn NZ 129985 R. *Coquet*

H. MacLauchlan, *E. branch of Watling Street* (1864), 12: remains of road and bridge piers supposedly Roman but probably 'of the age when the Priory flourished' (*i.e.* medieval); *cf.* Lanercost, p. 143 *n.* 1.

Road: Devil's Causeway (detailed course here unknown).

Bywell NZ 050615 R. *Tyne*

Newcastle S.A., *Lapid. Septen.* (1875), 338: 5 miles below Corbridge, '3 piers of a bridge of great antiquity and generally reputed to be Roman, stood in the bed of the river here until a very recent period'.

Comment. This bridge is unlikely to be Roman in the light of the Roman road and settlement pattern.

STIRLINGSHIRE: Larbert Bridge NS 852822 R. *Carron*

O. G. S. Crawford, *Roman Scotland* (1949), 16: possible stone piers and foundations of a wooden bridge, ¼ mile above Larbert Bridge between Camelon and Ardoch. *Margary*, II, 219.

Road: Camelon — Ardoch.

CLASS C (See p. 143)

Stone Bridges

CHESHIRE: Wallasey SJ 322894 *Wallasey Pool*

Chester Archit. and Arch. Soc. J., I, 55, 68, 465: bridge found buried in the silt; 100 ft. long, 24 ft. wide, and resting on two stone piers. Each span supported by four compound bearers, 33 ft. long and composed of three well-squared beams, which carried the transverse rafters. The mortice holes, some vertical and some oblique, showed that the bridge had cross-railed parapets.

Information from G. Stratton, Birkenhead Library: bridge probably Roman. Perhaps buried in inundation of 358 A.D.

Comment. The structure itself has no feature inconsistent with a Roman date, though it must be admitted that it could be much later. It is not connected with any known Roman roads. The depth at which the bridge was found makes a Roman date a strong possibility.

CUMBERLAND: Hyssop Holme Well NY 397568 R. *Eden*

Camden, *Britannia* (Edn. 1600), 704: mention of 'saxa ingentia'. Hutchinson, *Hist. of Durham*, II, 578: mention of piles. *Arch. Ael.*, *n.s.*, XII, 162: excavation to find bridge unsuccessful. A paved ford further east was probably also Roman in origin. *Cumb. & West. Trans.*, *n.s.*, LII, 131: R. Hogg records the rediscovery in 1951 of Camden's 'saxa ingentia', 40 yds. upstream from O.S. position. Two concentrations 15 ft. and 83 ft. from the south bank; 80 to 90 blocks of St. Bees sandstone of average size 34 by 19 by 12 ins. No voussoirs. Four blocks have splayed sides and may come from cut-waters. Cramp-holes, one lead cramp. Lewis holes. Two types of socket-hole for cramps, one large and dove-tailed in shape, the other a small socket with associated grooves (*cf.* Chesters). Six examples of shallow recesses, possibly for cement. Four stones with joggled corners. Stone faces show rough metal-tool dressing, a few with diaper pattern. One block with centurial inscription VESNIUS VIATOR (see Birley, *Cumb. & West. Trans.*, *n.s.*, LI, 179: a Hadrianic date is suggested).

Road: Stanwix — Burgh-by-Sands. This bridge continues the line of the Wall.

Willowford NY 622664 R. *Irthing*

As at Chesters, Northumberland (see below), remains of two Roman bridges on the same site. Part of Hadrian's Wall. *Cumb. & West. Trans.*, *2nd ser.*, XXVI, 429.

Bridge I: Part of splayed abutment survives, with a defensive tower. Also fragment of a pier. This bridge took the Wall and its walk across the Irthing. Re-used springers and a voussoir probably came from this structure; thus, a stone-arched bridge.

Date: probably Hadrianic.

Bridge II: Abutment of first bridge enlarged. Large pier (33 ft. long, 7 ft. wide, no cut-waters) built in the stream. This bridge was wide enough to take the Military Way (*cf.* Chesters). A second tower was built further to the east to replace the earlier. Three piers have been found; the two western are very deep, as the Irthing formerly flowed in a rocky gorge. A wooden superstructure is likely. The large easternmost pier embodied re-used masonry, including a voussoir. The second tower also contained two springers from a massive segmental arch (from first bridge). As at Chesters, the bridge was associated with a water mill.
Date: post-Hadrianic.

DURHAM: Binchester NZ 204318 R. *Wear*
See p. 138 for the evidence.

Hylton NZ 360577 R. *Tees*
R. E. Hoopell, 'On the evidence of a Roman bridge at Hylton', *Newcastle Daily Journal*, 27th July, 1882: swelling of abutment visible on each bank. 'Several sturdy oaks' were dredged up. Also large stone blocks, 5 ft. square, known to keelmen as the 'Break Stones' (? the bridge stones). 'Hundreds of tons' of squared building stones taken from the river in 1865. Long cylindrical column encircled with vine-leaves. Also a sculptured stone, with honeysuckle pattern. Also a stone 'with many facets'. Iron 'clamps' run in with lead on most of the stones. On one stone, a circular plate inscribed IM D AVG and SC. Very hard mortar composed of lime and pounded brick. One voussoir. 'Remains of oak timber as of a massive wooden framework were found beneath and among the stones'. The stones were described as a 'row of blocks stretching across the river'.
Comment: From the bulk of the stone-work and its characteristics (cramps, mortar and decoration) it seems certain that a bridge did exist here. This by no means precludes a paved ford; a bridge and a ford could both have existed, and been in use even at the same time. The bridge has no connection with known Roman roads. If the bridge had been Norman or later (unlikely with its characteristics), one would not have expected the access roads to have disappeared so completely.

DURHAM/YORKSHIRE:
Piercebridge NZ 213156 R. *Tees*
E. Wooler, *Roman Fort at Piercebridge, Durham*: stone piers visible until 1771. Wedge-shaped stone with cramp-holes (? voussoir) found in 1915. Also a 'coping-stone' with cramp-holes, and other large stones in the river-bed. Hutchinson, *Hist. of Durham* (1794), III, 214: piles visible in river after flood of 1771. *Yorks. Arch. Journ.*, XXXI (1934), 385: several oak piles revealed in 1933. Two large concentrations 22 and 52 ft. from the Yorkshire bank. 32 piles altogether; also cross-members buried in the mud. Suggested remains of bridge-piers. Large triangular stones lying near the piles (? voussoirs or cut-water points). These remains are on the line of Dere Street. The crossing is commanded by the fort of Piercebridge.

Pounteys Bridge NZ 346121 R. *Tees*
Surtees, *Hist. and Antiqs. of Co. Durham*, III, 228: lower courses of both abutments recorded. Vast quantities of squared stones in the river, cramped with iron. See also *V. C. H.*, *Durham*, III, 294.
Road: Thirsk — Newcastle.
Comment. An early medieval bridge and chapel existed on the site, but reference to iron cramps strongly suggests an earlier Roman structure.

GLOUCESTERSHIRE: Cirencester SP 027021 R. *Churn*
Ant. J., XLI (1961), 15: in front of the gate lay a massive abutment of a bridge. It is probable that this bridge was of more than one span. The inner edge of a possible central pier was found. Gate and bridge 2nd century.
Road: Akeman Street.

Comment. The abutment was 100 ft. long and curved. This may mean that the bridge was exceptionally wide or that perhaps there were two small bridges side by side opposite the carriage-ways through the gate. The edge of the 'pier' is only 8 – 12 ft. from the curved abutment; this distance is far too small for a span between abutment and pier, especially on such a monumental structure. It seems probable that this space is a deliberately constructed channel or vent *within* the abutment to take the water of the town-ditch system; on this hypothesis the outer face of the abutment is still to be found (*cf.* the mill-leat through the abutment at Chesters). Nothing can yet be said about the actual structure of the bridge; whether or not there are piers, or the nature of the superstructure.

HUNTINGDONSHIRE/NORTHAMPTONSHIRE:

Water Newton TL 117976 R. *Nene*

J. Ward, *Roman Era in Brit.*, 35: Roman bridge with stone piers noted at Caistor (on north bank).

Road: London — Lincoln.

The Latinised British name of Water Newton, *Durobrivae*, means 'Fort by the bridge' (see class D, p. 163). The crossing is commanded by the fort and later walled town of Water Newton.

LANARKSHIRE/STIRLINGSHIRE:

Summerston NS 580719 R. *Kelvin*

Miller, 88, 213: bridge took Military Way behind the Antonine Wall over the Kelvin (not the line of the Wall itself). Flat abutments, no protrusion. Stone piers, Dove-tailed cramp-holes. Masonry showed diamond, herring-bone, and fern-leaf tooling. Some rustication. Average block 24 by 14 ins. Stones laid in their natural bedding plane. Re-use and reconstruction attested by cramps on the upper and lower surfaces of some stones. Some obtuse-angled stones (? from cut-waters). No voussoirs. Remains of timber work: piles 4 – 7 ins. diam., lengths unknown. Two other timbers suggested as part of a raft under a pier, calculated to project in plan beyond the stone-work. Roadway about 17 ft. wide, compared with normal 30 ft. of Military Way.

The crossing is commanded by the fort of Balmuildy.

NORTHUMBERLAND: Chesters NY 913701 R. *North Tyne*

Remains of two Roman bridges on the same site, excavated in 1860 by John Clayton. *Arch. Ael.*, *2nd ser.*, V, 142; VI, 80; XVI, 328: these bridges carried the line of Hadrian's Wall itself across the river.

Bridge I. Embedded in the abutment of the second and later bridge is a complete pier with double cut-waters (20 ft. long between the points of the cut-waters, 12 ft. wide). There must have been at least four piers. No traces of abutments have been found for this structure. In the middle pier of the later bridge in the river bed, a pier-fragment of the first bridge survives. Stones joined by single dovetailed cramps. No voussoirs. This bridge was narrower than the second, and carried the Wall and its walk (not the Military Way as well).

Date: probably Hadrianic.

Bridge II. Consisted of three stone piers and two solid stone abutments. Eastern abutment completely excavated; main face 20 ft. wide with splayed sides (southern side subsequently lengthened to prevent river-scouring); large stones lifted by lewis, and tied by long iron rods with T-heads run in with lead (the stones were grooved for the rods); 'feathered' tooling; phallus carved on the northern face; defensive tower on the abutment. Several scattered stones of the bridge had grooves (? for spars); timber structure therefore likely. Large stone bollard 9 ft. long, 2 ft. diam. — possibly part of the tackle for fixing gratings between the piers. Piers had cut-waters on the upstream side only; lewis holes, tie-rods, cramps and grooves. No voussoirs. Road-way probably 20 ft. wide, to take the Military Way. The bridge was associated with a water-mill (see above, Cumberland, Willowford).

Date: post-Hadrianic.

The bridge is commanded by the fort of Chesters.

Corbridge NY 983646 R. *Tyne*

T. E. Forster, *J.B.A.A.*, *n.s.* XII, 205: bridge visible and partly excavated (north abutment). Ten stone piers and two solid stone abutments which are flat at the river-face. Length of bridge 154 yds. Piers with up-stream cut-waters only, 29 ft. long, 15 ft. wide, each 22 ft. 4 ins. apart. Road-way probably 20 ft. wide. Iron cramps run in with lead. No voussoirs. The present river course is further south than in Roman times and narrower. The length of the bridge, 154 yds., contrasts markedly with the present width of the River Tyne at this point, 100 yds. Although the bridge is set obliquely to the present course of the river, it was at right-angles to the original course.

Road: Dere Street. The crossing is commanded by the military and civil centre of Corbridge.

Comment. The figures quoted above for the present and original widths of the river may be taken as some indication of the general effect of embanking and dredging on the width and depth of rivers. The Corbridge bridge is very solid, and blocked the flow of the Tyne by more than half its width; the water must have ponded back up-stream, especially when the river was in spate. There may well have been flood-arches through the piers.

Elishaw NY 854953 R. *Rede*

Wallis, *Antiquities of Northumberland*, II, 59: '. . . a bridge of arches, some of the stones still to be seen with iron cramps in them, and melted lead'. H. MacLauchlan, *Memoir on a Survey of Watling Street* (1852), 32: 'rotten small trees' laid horizontal, with large stones on them. Also, in stream bed a horizontal timber apparently pinned by piles. See also I. A. Richmond, *Romans in Redesdale*, 70.

Road: Dere Street. The crossing is commanded by the fort at Blakehope.

Comment. Wallis's mention of arches could be purely supposition: there is no mention of voussoirs. Large stones and cramps suggest a bridge rather than a ford. The timbers are presumably part of a wooden raft under a pier.

NORTHUMBERLAND/DURHAM:

Newcastle (*Pons Aelius*) NZ 252637 R. *Tyne*

Newcastle S.A., *Lapid. Septen.* (1875), 461: observations on the site of the third pier from the Durham side, when the 18th-century bridge was demolished in 1872. The plan of the timber raft and piles was recovered. The raft was of pier plan, with double cut-waters (34 ft. long between the points of the cut-waters, 16 ft. wide) resting on piles driven into the river bed. Road-way probably 20 ft. wide. The timber was oak, and the carpentry was superior to that of the medieval and 18th-century bridges on the same site. The raft was 2 baulks deep, each measuring 12 by 6 ins. attached to piles 6 ft. long. Joints: mortice and tenon, and half-checks. Illustration of one large timber, which could be part of the timber superstructure of the bridge, with criss-cross parapet. One pile-shoe found, probably Roman (originally in possession of Ushaw College, Durham; now lost). Date: Hadrianic (Hadrian was of the Aelian family). For Latin name see Class D below.

Road: Thirsk — Chester-le-Street — Newcastle. The crossing is commanded by the fort of Newcastle.

N.C.H., XIII, 507 and *Arch. Ael.*, *2nd ser.*, X, 1–11: stones with the 'appearance of Roman tooling'. Cramps used. Resinous matter in one cramp-hole. *N.C.H.*, XIII, 543: four altars found in the R. Tyne on the site of the Roman bridge. Dedications to Neptune, Oceanus, Antoninus Pius, the fourth uninscribed but with draped female figure. (These were perhaps from a 'bridge chapel'.)

Comment. This is the best preserved example in Britain of the timber framework or raft on which the stone piers were built. The rafts were constructed on the bed of the river, and were stabilized by piles driven deep into the river bed. From the surviving record, it appears that the piles were driven in before the raft was constructed (*cf.* Collingham, p. 159). The timber raft was in effect double. A stout outer framework with the baulk laid side by side enclosed a smaller framework with two baulks one on top of the other. The two frames were separated by a layer of rammed gravel (1 ft. thick). The inner frame had at least 4 tie-beams to hold the outer baulks together. Both frames had a pier plan with double cut-waters.

NORTHUMBERLAND: Risingham NY 887862 R. *Rede*

Hodgson, *Blackgate MSS.*, V, 150: masonry visible at the confluence of the R. Rede and Chesterhope Burn. Stones dowelled and dove-tailed together; dowels and cramps of oak. J. Mothersole, *Agricola's Road into Scotland*, 169: large stones with cramp-holes in the bed of the stream.

Road: Dere Street. The crossing is commanded by the fort of Risingham.

Comment. If Hodgson's observation is correct, this site is unique in its possession of oak dowels and cramps. The existence of cramp-holes suggests a bridge rather than a ford.

NOTTINGHAMSHIRE:

Collingham or Cromwell SK 808613 R. *Trent*

A remarkably extensive and complicated structure found at two dates in the 19th century. Probably seven stone piers, lozenge-shaped in plan, set askew (therefore an oblique or skew bridge). These rested on rafts or 'cribs' of timber and stone. Each raft consisted of a lozenge-shaped timber frame, held by tie-pieces to a large central baulk. Each tie-piece had an octagonal head on the outside of the frame through which a vertical wedge was driven. A similar wedge, without an elaborate head, held the opposite end of the tie-piece to the baulk. The interstices of the timbering were filled with stone slabs laid edgeways, described by various observers as Ancaster, Coddington and Yorkshire stone. Four oblique mortice-holes in the central baulk took piles which went into the river bed 11 ft. Above the baulk they may have projected as bond timbers for the pier. There were four other shorter piles outside the faces of the raft to hold the structure in. Scattered masonry in the river, some stones with rebates on one edge. A baulk of black oak, said to be inscribed CLII may not be part of the bridge; this has been interpreted as the date of the bridge, 152 A.D.! but is probably a carpenter's mark. The northern abutment has been scoured away; the southern has not been found, and is presumably buried under the southern bank.

The raft is an interesting feature for its solidity and excellent carpentry. It was certainly pre-fabricated on land. The piles, which could only have been inserted after the raft was in position because of an expanded collar above the level of the baulk, pin the structure to the river bed.

J.B.A.A., XLI, 43, 83: description of 'cribs' and masonry in river bed. *Arch. J.*, XLIII, 26: similar description. *V.C.H., Notts.*, II, 25: summary of finds, plan and photograph; mentions the 'inscribed' timber. *Margary*, II, 278: mentions slots for the wooden superstructure. This is a misinterpretation of the mortice holes which were for the piles. These could not have projected far above the raft, merely enough to bond in with the stonework of the pier.

Road: a spur from the Fosse Way visible on air-photograph (CPE.UK 2009, 1308–9). It forks W. and N.W. immediately W. of the bridge. The road leaves the Fosse Way a little to the N. of Brough. See O.S. Map, *Roman Britain*, 3rd edn.

Comment. This bridge is generally accepted as Roman, though reservations can be made. In the extreme sophistication of the carpentry, in the lozenge-pattern of the piers and their skew lay-out, this bridge is unusual as a Roman structure. On the other hand, the associated road-system has the appearance of a Roman line.

SHROPSHIRE: Wroxeter SJ 562083 *Tributary of* R. *Severn*

J. A. Morris, *Trans. Shrops. Arch. Soc.*, 4th ser., XI (1927–8), 304: scattered lumps of tooled masonry, irregular in shape and size, some re-used. Lewis holes on most. Site of pier proved by bed of concrete, 24 by 4 ft. Position of piers indicated by piles of wooden cut-waters with vertical planking backed by clay. Piles, oak and sharp-pointed. Excavated pier now high and dry.

Comment. The account by Morris is confusing and incomplete. From the small-scale plan it appears that the pier is at right-angles to the Severn and it is beside the road high above the flood-plain. As recorded, the pier is more probably part of a structure across the small tributary valley, now dry, followed by the modern track from the church to the river. It remains highly probable that there was a Severn bridge cutting across the S.E. tip of the island . (See p. 153).

YORKSHIRE: York SE 601518 *R. Ouse*
Yorks. Phil. Soc. Rep. (1893), 8: 'masses of the strongest stone-work' opposite Guidhall.
Comment. This stonework probably part of the south-western abutment of a bridge connecting fortress and colonia. A frogman search for relics in the river bed was unsuccessful (information from L. P. Wenham).

CLASS C — (*continued*)

Timber Bridges

BERWICKSHIRE: Channelkirk NT 454572 *Tributary of Armet Water*
R.C.A.M. (Scot.), *Roxburghshire*, II, 472: there must have been a bridge over small valley (King's Inch) near Dun Law.
Road: Newstead — Inveresk. Dere Street.
Comment. This bridge site was presumably recognisable by the high level of the road on each side of the stream.

CAERNARVONSHIRE:
Afon Glan-sais SH 703721 *Afon Glan-sais*
R.C.A.M., *Caernarvonshire*, I, lxxiii: it appears that the stream must have been crossed by a bridge.
Road: Caerhun — Caernarvon.

CUMBERLAND: Caermote NY 202369
R.C.H.M. (Eng.), *unpublished*: to the north of the fort two roads with substantial aggers appear to cross a stream and marshy area by timber bridges; the two gaps in the aggers appear to be original and not worn, and are 45 ft. and 30 ft. wide.
Road: Caermote — Old Carlisle.

Rowgill Burn NY 674413 *Rowgill Burn*
Margary, II, 126: earth ramp of bridge on south bank.
Road: Kirkby Thore — Carvoran. Maiden Way.

DERBYSHIRE:
Doctor's Gate Culvert, Glossop SK 074941 *R. Grain*
Margary, II, 95: apparently a high level bridge. Remains of embankment ramp visible, some of the stones having been used to form a rough stair-way for the present crossing.
Road: Brough — Melandra.

DEVON: North Tawton SX 659999 *R. Taw*
Journ. Roman Studies, 43, 124; *Margary*, I, 112: high level bridge over gorge-like valley. Agger ends abruptly on brink on east side; west side eroded.
Road: Exeter — North Tawton — ?

DUMFRIESSHIRE: Holehouse Linn NT 061088 *Holehouse Linn*
Miller, 21: perhaps a wooden bridge of some height; when the road mound is first recognisable on the north bank it lies high above the stream. See also, *Margary*, II, 189.
Road: Carlisle — Crawford.

DURHAM: Birtley NZ 271570 *Leyburnhold Gill*
Road approaches from S. on causeway 90 ft. long, 26 ft. wide, of large metalling, and stops abruptly 10 ft. above stream. On the N. are two mounds, both of which could have been abutments (probably at different dates) to take the road N. and N.N.W.
Road: Thirsk — Durham — Newcastle.

Hunwick Gill NZ 199322 *Hunwick Gill*
See above p. 139.

Stockley Gill NZ 197380 *Stockley Gill*
See above p. 141.

Willington South Dene NZ 192352 *Willington South Dene*
See above p. 140.

ESSEX: Colchester TL 994256 R. *Colne*
M. R. Hull, *Camulodunum*, 11: mention of the former presence of abutment on the road northwards from Colchester; road metalling in banks. (There is another possible bridge site on the east of the Roman town. TL 007253.)

KENT: Flight Wood TQ 851350 *Nameless gill*
I. D. Margary, *Roman Ways in Weald*, 247: steep gill must have been crossed directly by a bridge. Slag metalling on the east side preserved.
Road: Hemsted — Canterbury.

LANARKSHIRE: Air Cleuch NS 955153 *Air Cleuch*
Miller, 55: 'embankments occur beside the stream, which the Roman road seems to have crossed on a wooden bridge'.
Road: Crawford — Dalswinton.

Shilling Cleuch NS 963187 *Nameless stream near Shilling Cleuch*
Miller, 29: conspicuous lump on south side of stream. Probably an abutment.
Road: Carlisle — Forth.

LANARKSHIRE/PEEBLES:
March Burn NT 042138 *March Burn*
Miller, 25: 'embankments appear to have carried the road where it crossed the burn, perhaps by a wooden bridge'.
Road: Carlisle — Forth.

LANCASHIRE: Cant Beck SD 631746 *Cant Beck*
Margary, II, 112: the agger can be seen on both sides of the Cant Beck 'which was evidently bridged'.
Road: Ribchester — Low Borrow Bridge.

Old Wennington SD 632719 R. *Greta*
Margary, II, 112: '. . . terraceways . . . which are still traceable, ending at abutments for a bridge'. *Antiquitates Bremetonacenses* (1824), 135: '. . . courses of hewn stone on both banks . . .'
Road: Ribchester — Low Borrow Bridge.
Comment. Earth abutments with stone facings probably existed here.

LANCASHIRE/YORKSHIRE:
Robert Hall SD 637696 R. *Wenning*
Margary, II, 112: the agger ends 'on the river bank in what was probably the ramp to a bridge'.
Road: Ribchester — Low Borrow Bridge.

MERIONETHSHIRE: Tomen-y-mur SH 708386 *Nant Tyddyr yr yn*
Margary, II, 83: ramp of a bridge S.E. of fort.
Road: Tomen-y-mur — Caer Gai.

NORFOLK: Caister-by-Yarmouth Approx. TG 230035
Journ. Rom. Studies, XLII-XLV (1952–5): the ditches of the defences of the town were crossed by timber bridges.
Comment. This sort of bridge must have been quite common in Roman Britain, though causeways are the more usual means of access. This site is included as representative of a larger class.

Denver TF 573004 *Stream now silted up nr. Old Bedford River*
E. J. A. Kenny, *Geographical Journ.*, LXXXII, 435: two earthen abutments 20 ft. wide, 20 ft. apart, 3 – 4 ft. high, excavated. 400 yds. west of Old Bedford River. Two post-holes on the eastern abutment; the southern was well-defined and rectangular, 12 by 15 ins., the northern being circular, 12 ins. in diameter. Spread of gravel on the south side suggested an earlier ford. See also *Ant. J.*, XIV, 184 and *Margary*, I, 203.
Road: Denver — Water Newton.
Comment. The two post-holes of different plan may be the result of the renewal of timbers.

Scole TM 147786 R. *Waveney*

Information from R. R. Clarke: timber bridge can be inferred from the nature of the terrain and the level of the Roman road metalling.

Road: Colchester — Caistor-next-Norwich.

Worthing TG 004202 R. *Wensum*

J. Toynbee and R. R. Clarke, *Journ. Rom. Studies*, XXXVIII (1948), 26: two lines of oak piles 8 ft. apart across the western channel of the river, now divided into two by a small island. Longest piles 8 ft. all driven into the sand below the peat. They probably formed part of the abutment of a timber bridge over the eastern, probably original, course of the river which is followed by the parish boundary. The western channel was possibly cut in the medieval period as a mill-leat. Tentative date for the bridge from tree-rings of a pile 12½ ins. square is *c.* 130 A.D. The bridge is associated with the Roman road from Brampton and Bawdeswell; the course to the south-west beyond the river is unknown.

Comment. Although these piles can be assigned to the Roman period with reasonable certainty, their interpretation is uncertain. They are unlikely to represent an abutment, as 8 ft. is rather narrow for the bottom of even a low abutment. For the same reason, a timber-revetted causeway approaching the crossing is unlikely. However, the piles would fit exactly as the remains of the uprights of a timber bridge.

NORTHUMBERLAND:

Edlingham Burn (1) NU 109076 *Edlingham Burn*

R. Wright, *Arch. Ael.*, 4th ser., XVII, 65: high causeway and abutment 12 ft. above the burn. Road 20 ft. wide.

Road: Devil's Causeway.

Edlingham Burn (2) NU 110075 *Nameless gully*

R. Wright, *Arch. Ael.*, 4th ser., XVII, 65: probably timber bridge. Gully 50 ft. wide, 12 ft. deep.

Road: Devil's Causeway.

OXFORDSHIRE: Asthally SP 313127 *Tributary of* R. *Windrush*

J. N. L. Myres, C. E. Stevens, C. F. C. Hawkes, *Journ. Rom. Studies* (1925), XV, 233 and *Ant. J.*, VI, 43: timber bridge replaced earlier ford. 'Rather over 50 ft.' long. High pitched causeway and abutment 10 ft. wide, 3 – 4 ft. above the stream. Excavation did not reveal any traces of the bridge itself (*cf.* Norfolk, Denver).

PERTHSHIRE: Brunty NO 195383 *Coupar Burn*

O. G. S. Crawford, *Roman Scotland*, 69: possible earthen abutment of a wooden bridge.

Road: Bertha — Cardean.

SHROPSHIRE: Acton Burnell SJ 524026 *Tributary of Row Brook*

Shrops. A. & N. S. Trans., LV, 38 and *Margary*, II, 50: two periods of Roman road leading to two bridge sites over a narrow gorge. The lower and earlier road shows a stone abutment on the S. side still 10 ft. high; the E. face is regular and original, the W. face has been rebuilt; the sides of the abutment are almost at right angles to the front face. The northern abutment does not survive. The higher, later road shows no stone abutments, but a large causeway-ramp on each side, ending at a 40 ft. sheer drop. The stone abutment probably represents a later packhorse bridge on the line of the first Roman road, but it may encase an earlier Roman abutment. The higher, later road must have crossed the gorge on a much higher bridge resting on the earthen ramps. A curving hollow-way leading to a ford upstream marks a later route. A relatively modern farm bridge (now collapsed) utilised the hollow-way.

Road: Wroxeter — Leintwardine.

SUFFOLK: Stoke Ash TM 113706 *Nameless trib. of* R. *Waveney*

Information from R. R. Clarke: timber bridge can be inferred from the nature of the terrain and the level of the Roman road metalling.

Road: Colchester — Caistor-next-Norwich.

SURREY/SUSSEX:

Kitford Bridge, Cowden TQ 459402 *Kent Water*

I. D. Margary, *Roman Ways in Weald*, 138: probably an embankment leading to a bridge.
Road: London — Lewes.

SUSSEX: Alfoldean TQ 118331 R. *Arun*

S. E. Winbolt, *Sussex Arch. Colls.*, LXXVI, 183: squared stones, tiles and oak stakes across steep-sided stream, 26 ft. wide. Represented as bridge with three stone piers with pile foundations. Piers approximately 23 ft. long, 2 – 3 ft. wide.
Road: Stane Street. The crossing is commanded by the fort of Alfoldean.
Comment. For a stone structure, this bridge crosses an extremely narrow stream. The piers are only 6 ft. apart, which is again unusual. In spite of Winbolt's interpretation, it is tempting to think of this as a wholly timber bridge with close-set (or even renewed) uprights, and stone-faced abutments which tumbled forward into the stream on decay.

Holtye TQ 463387 *Nameless stream*

I. D. Margary, *Roman Ways in Weald*, 159: embankment approaching a stream evidently bridged.
Road: London — Lewes.

WESTMORLAND:

Low Borrow Bridge NY 609014 *Borrow Beck*

J. Lofthouse, *West Pennine Highway* (1954), 126: 'a century ago, before the railway building . . . by the Borrow Beck were stone abutments of a Roman bridge'.
Road: Low Borrow Bridge — Brougham.
Comment. These abutments were probably stone-revetted earthen ramps for a timber bridge.

Wrynose Beck NY 284034 *Wrynose Beck*

Margary, II, 121: narrow rocky spot suitable for bridging. Also I. A. Richmond, *Cumb. and West. A. S. Trans., n.s.* XLIX, 15.
Road: Ambleside — Ravenglass.
Comment. This is a good instance of the recognition of a bridge site from the level of the roadway on each side, without actual abutments.

WILTSHIRE: Cricklade SU 106938 *Old course of* R. *Thames*

F. T. Wainwright, *Wilts. Arch. Mag.*, LVI, 162 and *Margary*, II, 264: ramp of bridge associated with double bend.
Road: Ermine Street.

YORKSHIRE: W.R., Coverdale SD 845467 *Tributary of Stock Beck*

Margary, II, 105: ramp-abutment visible on one side of stream.
Road: Ribchester — Ilkley.

CLASS D (See p. 143)

'AD PONTEM', East Stoke or Thorpe, Notts. 1 in. O.S. map, Sheet 112. R. *Trent*

Exact location unknown.
Source of Latin place-name: Antonine Itinerary.

'DUROBRIVAE' ('Fort by the bridge'),
Water Newton, Hunts. TL 117976. R. *Nene*

Also Class C (see p. 157).
Sources of Latinised British place-name: Antonine Itinerary and Ravenna Cosmography.

'DUROBRIVAE', Rochester, Kent TQ 741688 R. *Medway*

Also Class B2 (see p. 154).
Sources of Latinised British place-name: Antonine Itinerary, Peutinger Table and Ravenna Cosmography.

'DUROLIPONS', Cambridge TL 447589 R. *Grant*
Also Class B1 (see p. 153).
Source of Latin place-name: Antonine Itinerary.

'PONS AELIUS', Newcastle, Northumb.
NZ 252637 R. *Tyne*
N.B. Implication of Hadrianic date in Latin name.
Also Class C (see p. 158).
Source of Latin place-name: Notitia Dignitatum.

'PONTES', Staines, Middx. approx. TQ 032714 R. *Thames*
Implication, from plural form, of more than one bridge, unless the word means 'embankments'. Position of bridges and roads in the vicinity completely unknown.
Source of Latin place-name: Antonine Itinerary.

'TRIPONTIUM', Caves Inn Farm,
nr. Shawell, Warwicks. approx. SP 536795 *Small tributary of* R. *Avon*
Implication, from plural form, of three bridges, unless the word means 'embankments'. Sites unknown. On Watling Street.
Source of Latin place-name: Antonine Itinerary.

The writer will be grateful to receive any corrections or additions to the above lists; only a small proportion of the sites listed has been visited personally.

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