Overview of Data in the Compendium

The compendium presents information on bridges built before 1700 to carry roads, tracks and footpaths, mainly across water flowing in rivers, streams, burns, becks and brooks, but also those crossing moats, whether wet or dry. The information sheets document my attempt to repeat the survey carried out by Jervoise, after an interval of c90 years. I originally confined myself entirely to bridges surviving as masonry entities, but to take some account of the wholesale destruction of major medieval town bridges in the period from 1750 to 1850, I make mention of some of them in the preambles to the sets of information sheets. The information sheets can stand alone, and I say no more about them directly, save to point out that they are the sources of the data presented in the Tabulations, which are the main subject of this discussion. At the end of the overview, there is an Appendix dealing with a few Roman bridges which have left traces above ground.

(i) Variation across the Country of the Dates, at which Surviving Bridges were first Built

Table 1. Numbers of Bridges built in each Century, and Numbers Visited and Discarded Thereafter

COUNTRY/REGION	TOTALS PRE-1700	17th C*	16th C	15th C	14th C	PRE-1300	No. VISITED	DISCARDED**
Scotland	101	49	27	16	2	0	90	12
Northern England	230	119	22	38	17	12	201	8
East Midlands & East England	137	30	32	32	25	10	117	9
West Midlands & English Marches	83	28	15	19	9	2	74	11
Southern England	122	30	20	36	14	15	114	11
South-West England	175	76	32	38	10	5	161	10
Wales	84	47	14	12	2	1	80	11
Totals	**928‡**	**379**	**162**	**191**	**79**	**45**	**837**	**72**

Notes:

* ≡ Bridges placed in the 17/18th C date-range are counted as ½ bridges in the 17th century columns, before rounding

** ≡ Numbers of bridges identified in the desk-top assessment, but discarded thereafter

‡ ≡ Some bridges were doubled up under a single identifying number, so the actual number covered in the compendium is **c935.**

In the above Table and those below, the numbers presented are the number of bridges in the particular category.

It is worth stressing again that dating of individual bridges is in many cases inexact, being based on assessment of the significance of information of different types, which can be contradictory. However, it is reasonable to regard frequency figures of the type presented as valid, because 'rough edges' have usually been smoothed, within a grouping.

It is intended to replace the Tabulations for the different countries/regions by spread sheets which will make manipulation of the large amount of data easier. Creation of Tables 2 & 3 was a time-consuming and tedious task, completed 2 years ago. Although the base data in the Tabulations have changed to a small extent, Tables 2 & 3, have not been updated, as the conclusions, to be drawn from them are unchanged.

(ii) Variations across the country and with Build Dates of Bridge Parameters and Features

Some of the column headings in Tables 2 & 3 below may not be self-explanatory, i.e.

Ch. Arch Rings; each entry gives the number of bridges with chamfering of the outer voussoirs which form the arch shape, (illustrated in the nested documents containing the divisional tabulations)

Soffit Ribs/Ch.; each entry has 2 numbers, the first, the number of bridges with ribs on the underside of their arch(es), and the second, the number of bridges where these ribs are chamfered

Fabric; the numbers couples ashlar and coursed rubble masonry in the main body of the bridges excluding parapets and arch rings

Lintel; the number of bridges with rectangular apertures are, i.e. clapper bridges and developments of them

Table 2. Countrywide Variations in Bridge Features; 1500-1700 (Pre-Modern)

COUNTRY/REGION	Bridges Total	Span >7.5m	Width <2.2m	Gothic Arch	Ch. Arch Rings	Hood Moulds	Soffit Ribs/Ch.	Fabric A&CR	Lintel
Scotland	77	32	11	6	15	7	17/11	36	0
N. England	125½	61	61	9	10	18	6/2	79	10
E. Midlands & E. Eng.	63	4	15	6	11	3	11/4	35	2
W. Mids. & Eng. Marches	45½	2	14	3	2	1	4/1	29	4
S. Eng. & Thames Valley	49	0	9	10	8	0	5/0	26	1
S.W. England	103	6	34	17	2	14	0/0	29	8
Wales	62½	27	11	5	1	21	1/0	15	6
Totals	**525½**	**127**	**154**	**56**	**47**	**64**	**43/17**	**249**	**31**

Table 3 Countrywide Variations in Bridge Features; Pre-1500 (Medieval)

COUNTRY/REGION	Bridges Total	Span >7.5m	Width <2.2m	Gothic Arch	Ch. Arch Rings	Hood Moulds	Soffit Ribs/Ch.	Fabric A&CR	Lintel
Scotland	17	10	6	7	7	3	2/1	7	1
N. England	69	34	8	34	35	2	46/33	56	1
E. Midlands & E. Eng.	66	9	16	40	39	6	28/22	42	0
W. Mids. & Eng. Marches	28	4	5	17	8	1	11/3	22	1
S. Eng. & Thames Valley	73	2	5	36	22	0	20/13	33	1
S.W. England	58	6	9	32	18	2	6/5	18	5
Wales	15	5	0	6	2	2	1/0	4	3
Totals	**326**	**66**	**50**	**171**	**129**	**16**	**113/76**	**182**	**12**

Notes and Discussion

1. I begin with comments on the quality of the data. The total number of British bridges selected for further investigation as fitting my criteria, on the basis of desk exercises was 1007; of them 907 have been assessed on the ground, mainly by myself, but I am grateful to friends who have done the field work on several others. In general,

those unseen are biased towards smaller and more remote bridges, and especially the 55 moat bridges which are often in private property. The total number investigated includes 72 bridges, which were removed from the list, after visiting the location, on such grounds as collapse, replacement, or clear evidence that the bridge in question was built post-1700. So there remain 935 qualifying bridges, (c525 pre-modern, built 1500-1700, and c326 medieval, built pre-1500; note that the numbers do not add, because of the decision to count 17/18th century bridges as half-bridges, and because recently added bridges are not included in the sub-totals).

2. The information in the documents is certainly the most comprehensive available anywhere. Nonetheless, for many of the bridges, it is unavoidably incomplete and of variable quality. As regards the build-date estimates; the ideal scenario is to be able to point to documentation for the construction, and enough further documentation between then and now to give confidence that a bridge has been maintained and modified, rather than replaced in the intervening period. Needless to say, that is not the normal situation. More often some kind of consensus as to age can be reached on the basis of snippets of documentary information, circumstantial evidence, and surveys of a bridge in question by experts, who have looked for characteristics favoured during a particular period. Especially for smaller bridges, not least those named packhorse bridges, information is often more limited, either from documents or the appearance of the structure itself, and this is why the catch-all 17/18th century' appears quite frequently in the Tables. The age data is most meaningful taken in large chunks as here, without too much focus on individual bridges, and taken this way allows patterns and trends to be expressed as functions of time and place.

Unfortunately, the other data presented is not flawless either. The quantitative information for bridges like arch spans and widths is often imprecise because measurements, especially of the former, are not always easy to make, certainly without the skills and equipment of a professional surveyor. It has been the exception rather than the rule for most, who have described bridges in the past, to go much further than to specify the number of arches, and even Jervoise seemed to regard total bridge length rather than arch span as the key dimension, though bridge builders usually had to take the former as fixed by the configuration of a river and its margins. As regards width, the main problem is that so many bridges have been widened, and it is one thing to be able to see the effects in the soffits, and quite another to obtain an accurate estimate of an original dimension, taking account of perspective. It is probably a good time to stress that the values appearing here, are my best estimate for the bridge as built, rather than those of the present day or at any time in between. One feature does not appear because I did not pin it down with enough rigor at the outset, namely pier breadth. Criteria should have been 'broad', unexceptional, 'slender', and, ' part of a pierced causeway'. Latterly, I developed guidelines based on the ratio of pier breadth to adjacent arch spans, so that broad is equivalent to a ratio greater than 0.35, unexceptional, to the range, 0.1 to 0.35, and slender to less than 0.1, but these criteria have not been applied to sufficient bridges, to allow a comprehensive view.

3. The data in Table 1 can be compared with the only other nation-wide accounting of bridges by age, that I have seen, in 3 maps presented by Cook in his book on Medieval Bridges. As might be hoped, his numbers and mine for England only, as regards the 13th century or before and the 14th century are close, namely 36 and c80 bridges compared with my numbers of 44 and 75. For some reason, the agreement breaks down completely in the 15th century for which he records less than 70 bridges, so an actual decline in survivals, whereas my number is 162. I can offer no explanation for the yawning gap, not least because stone bridge building seems to follow a generally increasing trend through the centuries, notwithstanding events like plagues and civil wars, and survival to the present

day should be more likely, the shorter the time between construction and now. In addition, Leland's itineraries dating from the 1540s, which have fed through into my numbers, often by way of Jervoise, must presumably have influenced Cook, and might have been expected to improve agreement, rather than the opposite.

4. There is no doubt that bridge building in Scotland and Wales lagged behind that in England. The 44 bridges with significant pre-1300 masonry in England, noted above, compare with none surviving from then in Scotland and one in Wales. The data from both the latter countries suggest that most features appeared at least a century later than in England, until the industrial age. Bridge design in the far south-west of England also lagged, though this was not the case perhaps surprisingly, for the north, probably because many of the oldest surviving masonry bridges are grouped in clusters, near to major medieval religious establishments like Waverley Abbey in the south-east, and Durham Cathedral Priory and Fountains Abbey in the north, rather than radiating outwards from a single prototype, in the south-east. It is not obvious why a few out of hundreds of abbeys scattered round the country singled themselves out in this way; obviously they were rich, but not uniquely so, and there were rivers to cross almost everywhere. Clearly, some abbots were more far-sighted than the majority given that good transport links were surely a boon to most monasteries, with their large and often far-flung agricultural interests. Where there is commonality between the North of England and the other outer regions of Great Britain is in the surge of survival numbers which must reflect to some degree a corresponding surge in building, during the 17th century.

5. Considering my data in the light of Harrison's work, I have nothing to contribute to his most daring thesis that there was an extensive national road network with many bridges as early as the Anglo-Saxon era. These bridges must have been mainly wooden, so the fact that there are no traces above ground is not evidence for or against the conjecture. Another of his suggestions was that bridge building peaked in the 15th century, and that the rate of building slowed in the ensuing centuries before the Turnpike initiative and other major programmes in the 18th century. Although it needs always to be remembered that my data concerns survivals not builds, it still seems to conflict totally with that thesis, with numbers from the 16th century, more or less holding their own and then almost exploding upwards in the 17th century. However it can be seen from Table 1 that the numbers in the South of England follow something near to Harrison's pathway and those in Eastern England can be brought close to agreement by excluding the 22 moat bridges. The fact remains that the pattern is dramatically different in the remainder of the country.

6. Turning now to Tables 2 & 3, where caution must be applied to the accuracy of individual numbers, albeit that relationships and trends should be accurately reflected, the most remarkable feature is seen in the columns displaying the numbers of pre-modern bridges with arches spanning more than 7.5m. In Table 2, the data for all qualifying bridges shows that almost half the wide-span bridges are in the North of England, and that there are substantial numbers in Scotland and Wales, but comparatively few in the rest of England. This pattern has previously been the subject of general comments, though never, I think, made as explicit as here. Wholly satisfactory explanations are lacking, though it is fair to say that the large flow rates of the rivers of the north and west, and their propensities to flood almost compelled the development of designs with high and wide arches, which caused the least possible obstruction to flow. Obviously, the spans depend to an extent on the width of the river and any low-lying surrounds to be crossed, but otherwise it is a matter of choice for the bridge-builder. So it is surprising that wide-span designs were rarely adopted further south, given that they would have coped better with floods, even if of lesser magnitude, would have been cheaper to build, and would have eased water-borne passage. Table 3 shows that the distribution of medieval bridges, i.e. those built before 1500, with large arch spans

was not very different with more than half found in Northern England, with a healthy population in Scotland, and proportionately to the total number of bridges built then, in Wales also. The results in the two Tables also dispel any idea that spans increased systematically with the passage of time before 1700; location rather than age of a bridge is a far more relevant predictor of whether bridges are likely to have large spans.

7. I included the columns referring to narrow bridges to make two points. Firstly that the number of such bridges surviving from medieval times is relatively small and secondly that those remaining from the whole period up to 1700 are fairly uniformly spread across the country, apart from being noticeably scarce in the South of England. This may not conflict altogether with the common statements that packhorse bridges are found predominantly in the 'outer' more hilly regions of the country. My numbers include all footbridges, and it may be that the number built to serve local purposes, (access to churches and worksites) in more populous areas, balances the larger numbers built as part of long distance trading routes across northern and south-western hills.

8. The columns referring to the Gothic arch shape, chamfering of arch rings, and the insertion of ribs in the soffits (arch vaults) demonstrate that such features are indeed indicators of medieval origins, far more often than not. Looking at the figures for the whole country it is clear that the appearance of one of the three is suggestive rather than conclusive, while, the appearance of more than one of the features increases the likelihood of a pre-1500 build date. There are significant regional variations. In Scotland the features are found so frequently on 16th century bridges that they support the assertion that building of medieval-style bridges extended well into that period. In Wales, chamfered arch rings and soffit ribs are very rare, and Gothic arches seem as likely to be found on bridges built after 1500 as before. Of the three features, only Gothic arches are common in the two western regions of England.

9. The column for hood moulds suggests that they are mainly, though not exclusively, a post-medieval feature; however, the fact that relatively few bridges were built in the medieval period in the regions, where the feature was later common, needs to be allowed for. Non-occurring in Southern England, as opposed to the South-West, they are especially linked to bridges in North Wales, but also are common in Northern England and Southern Scotland.

10. The columns in Tables 2 and 3, numbering the bridges with lintels, include both basic clapper bridges, and a few bridges in South West England and Wales which start from that form and build upon them, roads with parapets. They are absent from Southern England, and rare in Scotland.

11. In the column dealing with fabric, ashlar and coursed rubble are taken together because both require significant shaping of stone, and the distinction between them is sometimes a subjective judgement. In areas characterised by harder rocks, like Devon, Wales and Scotland, ashlar fabric was not an easy option, given the machining required. Nowadays, it is easy enough to bring in suitable stone from a distance, when local sources are lacking, but this only became feasible at the start of the canal age in the 18th century. Hence the well- documented building of wooden bridges in medieval times in South and East England, and early experimentation there with brick. It is also true that except in close proximity to thriving religious houses, small bridges were almost exclusively rubble-built, presumably because the creation of ashlar building blocks added significantly to the cost.

12. I have adopted a broad brush approach to considering the data I have collected. For reasons that will quickly become apparent it may be inadvisable to dig down to try to answer questions about the locations and characteristics of bridges, viewed individually or in smaller groups. It must always be remembered that we cannot look directly at the population of bridges which existed in any time period, but look always at a sample filtered by

survival, in which many factors including chance have played a part.

(iii) Survival Rates of pre-1700 Bridges

In the course of 2021, methodologies for estimating the survival rates of historic bridges, and interpreting the results were developed. Documents in the 2021 version of the website, which this version supersedes and the pamphlet, ISBN 978-1-7399648-0, otherwise, https://drtomsbooks.files.wordpress.com/2021/11/some-recent-investigations-of-the-historic-bridges-of-the-british-isles-final-draft.pdf, were interim progress reports, and this is the finalised version.

Studies of old maps have suggested a way of estimating the likely survival rates of bridges standing at certain times in the past. The British Library, and the National Library of Scotland have digitised these maps, and placed them on free to access web sites, thereby rendering a massive service to all antiquarians, other interested parties, and in my case making possible the analysis which follows. Large numbers of bridges are marked on some of these maps, and a methodology has been developed to decide, which of them are represented by coherent remains today. In the case of England and Wales, the starting point was the compendium, from which individual bridges dating from the 16th century or before, and still standing in coherent form in each county, were identified, and listed. Then, reference was made to the maps of those counties produced by Christopher Saxton, in c1583, or occasionally, where Saxton dropped below his normal level of detail, recourse was made to the equivalent maps produced by John Speed in c1610, and the bridges marked in each county were identified, and listed. Comparison of the two lists, identified the bridges standing in the late 16th century, which stand in some coherent form, now, enabling the %age survival rates to be calculated. The process sounds simple but was complicated by understandable inaccuracies in the early maps, by changes in place names, and such things as inconveniently placed folds and blots on the early maps, so errors will certainly have been made, but hopefully not too many of them. Nothing could be said in this context, about bridges missed by the early map-makers, though I will return to them, but the survival rates were for a sample of bridges, i.e., those not missed, and as shall be seen it was a large sample.

As I proceeded, county by county, it became clear that at that scale, there are wide variations in survival rates, which is no surprise given the elapsed time of over 400 years, and the many factors which could lead to the disappearance of a bridge, collapse, and replacement, amongst them. However, when the results were agglomerated into the 6 regions/country used for the data sets, patterns emerged, which can be seen in Table 4. For Scotland, there were no comprehensive 16th century maps, though Timothy Pont provided some coverage. However, there are useful digitised maps of 17th century Scotland, produced by Jean Blaeu in c1650, and John Adair in the 1680s, though with variable coverage of the whole country. David Simpson, creator of the website https://scotlandsoldestbridges.co.uk/one.html, has skilfully pulled together that information, and I include a row for Scotland, in Table 4, which follows. I also present, with minor alterations, the analysis of the results given in the aforementioned pamphlet, issued in September 2021, which I qualify with a few comments, made in December 2021.

Table 4. Survivors of Bridges identified on Early Maps

Region/Country	No. of Bridges standing in 16th C	No. of Survivals	Survival Rate %age	Variation in County %ages	Survivals of 'non-Saxton' Bridges
Northern England	245†	55	22%	11% - 52%	35
Eastern England	244†	44	17%	0% - 50%	40
West Midlands & Marches	135†	21	16%	4% - 34%	16
South & South-East England	254†	39	15%	0% - 36%	35
South-West England	194†	35	18%	12% - 37%	70
England, Total	**1072†**	**194**	**18%**		**196**
Wales	**107†**	**11**	**10%**		**13**
Scotland	**285 ‡**	**48**	**17%**	**11% - 27%**	**44**

† These numbers are of bridges shown on maps due to Christopher Saxton dated within the 1580s, save in a few counties round London, where maps due to John Speed, and dated to 1610 had to be used to provide additional information; with a certain amount of fuzziness, I call them late 16th century bridges.

‡ These numbers are of bridges shown on maps due to Timothy Pont, Joan Blaeu, and John Adair produced between 1583 and 1682, so with similar fuzziness, I refer to them as 17th century.

Notes:

1. I am well aware of the uncertainties and inadequacies associated with these numbers, but taken together, they enable estimates to be made. Rather that survivability being purely a matter of speculation, it is now possible to say, based on a sample size of 1179 bridges standing in the late 16th century in England and Wales, that c17% of them have left coherent remains which can be observed today. The figures for Scotland appear the same, c17%, of a sample of 285 bridges, though it should be remembered that they apply to bridges standing in the 17th century, so have survived for nearly a century less. In case clarification is needed, we are not considering bridges built in the late 16th or 17th centuries, but those standing then, whenever built.
2. The variations in survival rates between regions/countries are substantial. It might be surmised that lower survival rates in South East England have resulted from the need to knock down bridges causing obstruction, to flow of water or traffic, in a densely populated region, while the higher survival rates in Northern England, might be in part

attributable to the greater durability of bridges made from granite, millstone grit, or old sandstone, but these are speculations. Another contributary factor might be sensitivity to decisions on allocation of bridges on the border between two counties; Buckinghamshire had a survival rate of zero, (now one), but if I had allocated to it 2 bridges on the county border, the number would have been close to 10%. Column 5 presents the range of variation by county or county grouping, in the region/country indicated.

3. Column 6 shows the number of bridges in each region, identified by my analysis as standing pre-1600, and included as such in the compendium, but **not** marked by Saxton or Speed. Their failures to mark them could have many explanations, e.g., sites on smaller streams, distance from important routes, or indeed because they did not actually exist, when surveys took place, albeit that they might have done before and after; it is also possible that my date estimates are wrong for some of them. This is very speculative, but if survival rates were similar for bridges missed, and those marked by the mapmakers, there might have been over 2000 pre-1600 bridges in England, and 400 in Wales. Of course, many were no doubt of wood rather than of stone, and so almost guaranteed not to survive to the present day. In Scotland, the numbers might imply on the basis of similar assumptions, that more than 500 stood in the 17th century. There is another puzzling fact to be taken into account in Scotland; the compendium contains very few pre-1700 bridges, north and west of the 'Highland Line' (roughly linking Glasgow, Stirling, Perth, and the Moray coast). Given that the population in that sector of Scotland was relatively far larger than now, pre-1700, perhaps half the national total, there must have been many bridges there, which have not survived conditions, harsher than elsewhere in Britain.

4. Relatively few medieval bridges still stand, but conclusions are drawn about the whole built population, as regards features thought to characterise bridges in this group. Considering any one of the features found on surviving medieval bridges, say the Gothic (pointed) arch shape. The justification for believing on the basis of small sample sizes, that the building of Gothic arches peaked in the 14th and 15th centuries and declined thereafter, comes from the divergence of this pattern from that of sample size, which increases for less-old bridges. In fact, the proportion of Gothic arch bridges in the surviving sample, decreases after the 15th century, and this can be regarded as a real effect, reflecting the change in the proportion of Gothic arch bridges being built. There are limits to this process, which may apply to the oldest bridges, with sample sizes only a few percent of the built population, but in general the rule holds, and conclusions can be drawn.

5. The one definite problem concerns trying to change the direction of the argument. Hood moulds, (semi-circular projections above the arch ring), are relatively common on pre-modern bridges in the outer parts of Great Britain, (South-West England, Wales, North-West England, Scotland) and absent elsewhere. They are rarely found on medieval bridges in those regions or elsewhere, but it would be dangerous to draw strong conclusions, because the sample sizes are small. It remains more likely that the apparent low incidence is correct, but with very small samples, the chance of one or a few bridges with hood moulds being amongst the large population of bridges, which have not survived cannot be discounted.

6. There is insufficient information to plot the relationship between the %age of bridge survivors at any date, against those dates, but it is possible to perceive the form such a graph must take. No bridges in England and Wales survive that stood before the 12th century, but 17% survive which stood in the late-16th century, and we know that most bridges, standing in the past century survive. This just about defines an S-shaped curve, rising slowly at first, then taking off in the 17th, and 18th centuries; by the end of the latter, the survival rate is probably c90%, so the curve flattens out again to reach 100% in the mid-20th century, after the 2nd World War. In Scotland, no bridges

survive from before the 14th century, and the 17% survival point is reached in the mid-17th century, so the Scottish curve lies below the English one but takes the same form. These curves are not of great practical importance, but they should be borne in mind when considering the likely applicability of evidence, gained from any old bridge.

7. It may be that this kind of analysis, impossible without the freely available digitised maps on the British Library, and National Library of Scotland websites, has been carried out before, but if so, I have seen no evidence. It has its faults and inaccuracies, but in my view gives a firmer basis for those who wish to consider this part of the built environment in the 16th century in England and Wales, and in the 17th century in Scotland. More importantly, it provides firm backing for assumptions that consideration of the surviving population of old bridges allows firm conclusions to be drawn about the whole built population of the artefacts.

(iv) The Oldest Bridges in Great Britain

Until a relatively late stage, the focus has been on standing bridges, (or at least, part-standing bridges), but recently attention has also been given to ancient bridges, especially in large towns, which have not survived. The question as to what was the first masonry arched bridge, built in Great Britain, has arisen, on the basis of this widened approach. Table 5 shows the oldest standing bridges, listed by region, with particular focus on arch shape, to which have been added, (in red) a couple, older than any of them, which were demolished in the 19th century.

Table 5. Arch Shapes on Bridges Built in the 12th and 13th Centuries

County	Bridge Name	Build-Date	Arch Shape ‡
Durham	Elvet	1160 - 1250	S-C/P
Durham	Framwellgate	12th C	S-C
Northumberland	Morpeth Chantry	13th C	P
Northumberland	Old Tyne	13th C	P
Yorkshire	Baysdale Abbey	13th C	P
Yorkshire	Butterton	13th C	P
Yorkshire	Fountains Abbey Infirmary	12th C	S-C
Yorkshire	Scarborough Castle	13th C	Se
Yorkshire	Otley	1228	Se
Yorkshire	Wetherby	1233	S-C/P
Bedfordshire	Harrold	12th C	S-C
Bedfordshire	Sutton PH	Mid-13th C	P
Cambridgeshire	Huntingdon	c1300	P
Essex	Coggeshall	13th C	P
Lincolnshire	Lincoln High	1160	S-C
Lincolnshire	Stamford	12th C	S-C
Northamptonshire	Geddington	1250	P
Northamptonshire	Thrapston	13th C	P
Nottinghamshire	Nottingham Castle	1255	P
Suffolk	Bury St. Edmond's Abbot's	13th C	P + Se
Gloucestershire	King John's	1190	P
Shropshire	Shrewsbury Old Welsh	Mid-13th C	S-C/P
Hampshire	Fordingbridge	1286	P
Hampshire	New Alresford	Early-13th C	P
London	Bow Bridge	c1115	P
London	Clattern	Late-12th C	S-C
Oxfordshire	Folly Bridge	1085	S-C
Oxfordshire	Banbury	13th C	P

County	Bridge Name	Build-Date	Arch Shape ‡
Oxfordshire	Radcot	13th C	P
Oxfordshire	Wallingford	Mid-13th C	P
Surrey	Elstead	13th C	P
Surrey	Lower Eashing	13th C	P
Surrey	Somerset	13th C	P
Surrey	Tilford - North-East	13th C	P
Surrey	Tilford – North-West	13th C	P
Surrey	Unstead	13th C	P
Wiltshire	Bradford-on-Avon Town	Late-13th C	P
Wiltshire	Salisbury - Harnham	1244	P
Cornwall	Lostwithiel	Late-13th C	P
Devon	Barnstaple, Long	1280	P
Devon	Clyst St. Mary	Early-13th C	S-C
Devon	Old Exe	1196 -1214	S-C/P
Devon	Larkbeare	13th C	P
Gwent	Monnow	13th C	S-C

‡ Shape Key; S-C ≡ Semi-circular, Romanesque, P ≡ Pointed, Gothic, Se ≡ Segmental; some bridges had arches of different shapes

No bridge, about which any information on form, dimensions, or other features, is known stood in Scotland before the 14th century; Balgownie Bridge near Aberdeen is usually taken to be the first.

Carrying the bridge form data, a step further, the information in Table 6 is drawn from the Tabulations; remember that it refers to survivals, but can be taken to reflect the built population.

Table 6. Numbers of Bridges with different Arch Shapes in Great Britain in the Medieval Period

Arch Shape	No. of Bridges Pre-1300	No. of Bridges 14th C	No. of Bridges 15th C	No. of Bridges !6th C	Totals
Semi-Circular (S-C)	13	7	17	26	63
Pointed (P)	33	48	87	42	210
Segmental (Se)	3	13	49	63	128
4-Centred (4-C)	0	0	13	21	34

Some trends are more obvious than others, but the rise and then fall in numbers of bridges with pointed (Gothic) arches is clear enough. Although it is not meaningful to attempt to look at the 17th century in the same way, because of the 17/18th century cohort, there are a greatly diminished number of bridges with pointed arches, which were built then, and no 4-centred arches.

(v) Conclusions

It is clear that the data set has the potential to enhance understanding of bridge design through the centuries. In its current form, as Tabulations, analysis is not easy, hence the intention to move to the use of spread sheets.

The other incomplete aspect of this version of the compendium, concerns the sketch maps accompanying the collections of information sheets. Bridges added since the maps were drawn will be added.

Appendix

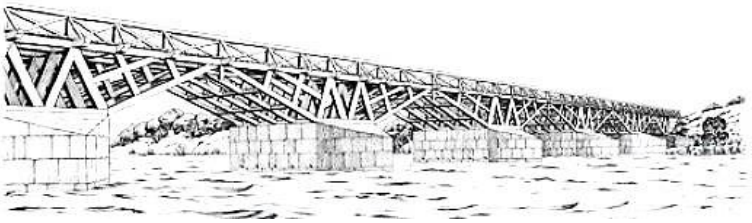
Lastly, I will deal briefly with the topic of Roman bridges. Many old bridges throughout the country are given that name, but the only true Roman bridge remains which I have encountered are in Northern England, though such bridges would have been common, throughout the occupied regions, before the Roman departure in c400 AD. The

standard type seems to have employed stone abutments and piers on which wooden platforms were laid, but as in the rest of their empire they built stone arched bridges as well. The hybrid stone/wood bridges were probably in use long after the Romans left Britain in the 5th century, being easy to repair and maintain, and the earliest bridges built by the Anglo-Saxons were almost certainly to this pattern. There is no reason to doubt that such bridges continued to be built and used, especially in the South of England, throughout the medieval period. However, the future lay with the arched bridges, which fill this document, and it is the few Roman bridges which have left traces that I deal with here.

(i) Chesters Roman Bridge in two manifestations spanned the River North Tyne just downstream of Chollerford and where Hadrian's Wall reached Chesters Fort on the right bank of the river. In its earliest form, the bridge was probably built in 122 AD and comprised a set of arches thought to span 4m each, 9 in all, which carried Hadrian's Wall over the river. When the Romans pulled back from Scotland, the second bridge, a much more substantial affair was built in 160 AD. It had 4 semi-circular arches, which must have spanned nearly 10m each, and carried a roadway 6m wide with stone parapets. The bridge is thought to have survived the Roman departure around 400 AD, eventually being dismantled in the 7th century when much of the stone found its way into the buildings of Hexham Priory. The visible remains shown below are somewhat disordered but comprise the foundations of the guard house and abutments on the east bank of the river, which can be accessed from a path leading from Chollerford. Excavations on the other bank have apparently shown the presence of corresponding structures there, and remains of the piers of the second bridge survive on the river-bed.

(ii) Corbridge Roman Bridge was located a few hundred metres upstream from the standing 17th century bridge, and carried Dere Street into the Roman fort at Corbridge, and northwards. It may have been the largest Roman Bridge built in Britain. It was 138½m long and had as many as 11 stone arches supporting a road 9m above the river. The road was 6m wide and the piers were 4½m in breadth, the channels between them were 6½m wide. Dere St approached the bridge by way of a long gradual ramp. It should be emphasised that it was a large bridge even by today's standards, wider and comparable in height to its 17th century successor. It was built in 160AD, and almost certainly had a wooden predecessor. There are apparently many blocks on the river bed which survive from the stone bridge, and in 2004, blocks, which had formed part of the wall of the aforementioned ramp, were dug out from the south bank and piled up as a wall, though the result is not meaningful.

(iii) **Piercebridge Roman Bridge** remains are in a field, two hundred metres east of the present bridge over the River Tees in Piercebridge, about 6 miles west of Darlington. They lie east of the line of Dere Street, and archaeologists think that they were part of the second Roman Bridge, to cross the river here. The site is quite confusing, because the river has shifted north, so that the view looking south below is of the remains of a ramp leading onto the bridge, and of piles of large blocks which are remnants of southern piers. The north abutments are not visible. The excavated remains now sit below the surrounding land because of the build-up in levels over nearly 2000 years. An unusual feature, is the paving of the river bed around the piers, presumably to smooth the flow and reduce erosion. It is thought that the upper structure was made of wood, as in the reconstruction. It has been suggested that the bridge survived in use until the 16th century, after the present bridge was built, but that seems incompatible with the depth to which the remains were buried



(iv) **Willowford Bridge** carried Hadrian's Wall with its walkway, and later a broader roadway across the River Irthing, a major tributary of the River Eden. It is just to the west of the village of Gilling, and accessed by way of a sign-posted farm road. The first bridge was built shortly after 120 AD, and it was variously altered until the early 3rd century, when most of it seems to have been washed away by a flood, to be replaced by a wooden structure of which there is no trace. Stone was then scavenged for the fort at Birdoswald, and it has suffered other depredations in the centuries since. In the aerial photograph, the wall runs from the bottom left hand corner of the frame to a square turret right in the centre. Further along the wall, are the remains of an abutment, and after a short gap, the first pier; the river has long since shifted to the west, out of shot to the right. In the lower photograph, the remains of the pier are in the foreground, then the abutment, with the wall and two turrets behind.

It is likely that there were many Roman bridges further south, and I find the absence of tangible remains surprising.