

III

THE MOST ANCIENT BRIDGES IN BRITAIN.¹

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NATIONAL CHARACTERISTICS.

A study of bridge-building reveals to us the interesting fact that nationality plays an important part in the development and construction of these useful means of communication. The Celt and the Scandinavian seem to have been almost exclusively builders of wooden bridges, while it is the Latin race to whom we appear to be indebted for all the old stone bridges, just as it is to the Anglo-Saxon race in modern times that we owe the great iron bridges that span our rivers.

EARLY METHODS OF CROSSING STREAMS.

In order to grasp the early methods of crossing rivers it is only necessary to take up philology to find that in Greek, Sanscrit, Hebrew, and Arabic the word for bridge is practically the same now as a dam or barrier of some kind, and we thus assume that stepping-stones were actually the earliest form of bridge or method of crossing a river. In several places in England, notably at Ilkley (fig. 1) and Morpeth, shaped stones are employed in series for the purpose of crossing the wide rivers; and these nerve-trying steps present a most ingenious and inexpensive substitute for a bridge, such as is rarely to be observed in Scotland.

The English word bridge originally came from the Scandinavian *brycg*, the gangway that was used in the Viking ships. It is still used on board ship, and reveals to us the essentially wooden character of the early bridges in this country and the origin of the application of the name.

It is not easy to find what was the design of these early wooden bridges, but a wooden bridge now existing in Formosa probably shows the most primitive form of bridge. The poles driven deep into the river bed, a cross beam tied to the ends and the planks laid between the cross beams, were all that was required to complete a bridge across almost any stream, and this gives us the form probably almost universal in countries where wood was abundant.

¹ Previous papers on the same subject: "The Ancient Bridges of Scotland," January 1912; "The Roads and Bridges in Early Scottish History," February 1913.

EARLY STONE BRIDGES.

In regard to stone bridges, the permanent relics of Roman bridges do not extend much further north than Lyons—the North of France being apparently destitute of these structures. In England, although the course of the Roman roads brings them across large rivers, there is no bridge left belonging to the Roman period, although the founda-



Fig. 1. Stepping-stones at Ilkley (Yorks.).

tions of piers have been uncovered by excavation, but whether or not they carried arches is unknown.

In the Antonine Itinerary there are three places in England where the root “pont” comes in in regard to the Roman stations—Pontibus near Staines, Duroliponte (apparently Godmanchester), and Ad Pontem beside Newark; whether the Pons Ælii of the Notitia was across the Tyne or Jesmond Dene is a problem not yet solved, but in all these cases there is no Roman bridge now at the places named. The chief relic, however, of the remains of a Roman structure is on the Roman Wall between Newcastle and Carlisle, at Chollerford, where the Wall crosses the river North Tyne, and a series of heavy piers and abutments show what was clearly at one time a barrage.

In Scotland there are no Roman bridges left on such highways as are

generally recognised to be Roman, and no definite investigations have yet been made as to how the chief rivers were crossed.

MEDIAEVAL WOODEN BRIDGES.

In mediæval times in Britain all the early structures seem to have been of wood, and the records of history all seem to point to the same conclusion. In 1008 the wooden bridge over the Thames at London was torn down by the Danes. In 1066, at the battle of Stamford Bridge (in Yorkshire), the decisive stroke was caused by a warrior in a boat thrusting up his spear from below and killing the valiant defender of the bridge. In 1296 Wallace caused the bridge at Stirling to be cut at a critical moment, and thus secured the defeat of his adversaries. In 1322, at Borough Bridge, the Earl of Hereford was killed by a spear thrust from below between the planks of the bridge. Seeing the references to wooden bridges are so universal in history, it is interesting to find that an old chronicler (Stow) preserves the statement that Bow Bridge near London, built by Matilda in 1110, was the first *stone* bridge in England, and that it got its name from the shape of the arch. The Matilda or Queen Maud referred to was the wife of Henry I. of England and daughter of Malcolm Canmore of Scotland and Queen Margaret. Whether the statement is accurate or not, it at least shows that the early chroniclers were fully aware that stone bridges were of no great antiquity, and thought the fact worth recording.

EARLY PICTURES.

In order to ascertain when the old wooden bridges were replaced by those of stone, historical works must be scrutinised for references; and illustrations, such as early prints, pictures, or seals, must be sought for and examined. If such be found representing any existing ancient bridge, a careful comparison of all its details must be made to identify the remaining parts of the original structure. But in vain do we scan the old paintings and pictures for enlightenment—they are almost exclusively concerned with ecclesiastical objects—and we have to fall back upon what may be called accidental illustrations, for crude representations of the appearance of the ancient bridges. In the pictures in the chief galleries of Europe, bridges—except in the dim background—are conspicuous by their absence; there is, however, in the British Museum a sixteenth-century illuminated manuscript with a picture of London Bridge, which, compared with the later eighteenth-century drawings, shows that at the latter date great changes had taken place.

This picture represents London Bridge with its chapel, as well as a

number of houses erected upon it, and there may be observed clear traces of the ribs below the arches, which do not appear on the later pictures. It is therefore fairly evident that, in the long course of its existence, arch by arch London Bridge had to be rebuilt and repaired so much, that in the end there was very little left of the original structure.

In Scotland the earliest picture with a representation of a bridge appears to be a thumbnail sketch of the long washed-away Perth Bridge, drawn on one of Timothy Pont's manuscript maps (in the Advocates' Library) about 1615. The name of the bridge is not given, but, as there are eleven arches in the sketch, and as Perth Bridge was known to have eleven arches, the inference is justifiable.

REPRESENTATION ON BURGH SEALS.

Though pictorial representations of bridges are few, a number of Burghs use a bridge as an emblem on their seals, and thus we have Barnstaple, Bideford, Bridgwater, Cambridge, Colchester, Maidstone, Rochester, and Stirling giving us early representations of their local bridges. In only two cases, Rochester and Bridgwater, do we see the design of a wooden bridge. The seal of Colchester, supposed to go back as far as 1189, depicts a castle upon three arches over a river, with a fish below each arch; but it is extremely doubtful if it is intended to be a representation of a bridge, as the fish refers to the fishery with which the town was closely connected, and the curves may be merely a species of arcading.

Barnstaple Burgh seal, representing a bridge, dates back to 1303.

Bideford, with its long bridge of twenty-four arches, was one of the very early examples of a public benefaction, as the money for its construction was collected from all over Devonshire *circa* 1330.

The burgh of Cambridge did not have, at first, a seal, but the Mayor had one in use showing a four-arched bridge, and it is attached to a document dated 1352. The burgh seal was made in 1423—also showing a four-arched bridge; and in 1471 a new Mayor's seal was in use varying slightly from the previous one.¹

Rochester, like Barnstaple, had a very long bridge, which, being of wood, was destroyed by fire in 1264, and swept away in 1281. Through the instrumentality of Lord Cobham, a Bridge Trust was founded in 1398, the seal of which, used in 1420 (fig. 2), apparently furnishes a representation of the wooden bridge that had been destroyed in 1281. This seal disappeared in 1804, and when a duplicate was cut the original came to light in the British Museum Collection.

¹ Mr T. D. Atkinson, *Camb. Antiq. Soc.*, vol. x.

Another seal with a picture of a bridge on it is that of the Cobham College, but it is of no definite value, as the bridge thereon merely signifies the two members of the Rochester Bridge Trust who were elected to Lord Cobham's College Trust. (The Cobham is the name of the person and not the village of Cobham in Surrey.) The seal now used was cut in 1806, as the original seal of 1598 disappeared at the same time as the Rochester seal; but it represents generally the original, though the numerals are in more modern lettering.

The seal of Maidstone, *circa* 1550, is also of some interest, but the picture of the bridge shown on it is insufficiently detailed to be of any service.



Fig. 2. Seal of Rochester Bridge Trust.

By far the finest of all the seals showing bridges is that of the burgh of Stirling (fig. 3), where within a 3-inch medallion we have a wonderful picture of men crossing a bridge. A specimen of this seal is known to have been attached to a document of 1296; but with its clear indication of wooden piers and stone overhanging parapets it presents such a reversal of all bridge design that as a representation of the actual bridge it is manifestly unsatisfactory.

Pontefract has also a seal with a bridge on it, but the design is comparatively modern, and appears to be connected with the supposed origin of the name, implying a broken bridge. It is somewhat strange that no one has drawn attention to the fact that there is no river at Pontefract, nor a bridge of any size within three miles of it, the nearest being at Ferrybridge. There is a story that the bridge at Ferrybridge broke down while the Archbishop of York was crossing it in the twelfth century, and for this reason the name "Kirkby" was changed to "Pontefract"; but it is hardly credible that the name of a town three

miles away should be changed by this incident. The ancient seal does not exhibit a broken bridge.

Grampound, a small market-town in Cornwall, has a seal showing



Fig. 3. Ancient Seal of Burgh of Stirling.

a stone bridge of two arches, but it has no appearance of antiquity in its design.

EARLIEST TYPES OF BRIDGE.

A study of the earliest of these seals has made it fairly clear that prior to the use of the pointed arch the earliest type of bridge had an almost semi-circular span springing fairly high above the river bed, and a search in the vicinity of some of our earliest ecclesiastical buildings has resulted in the discovery, at Fountains Abbey in Yorkshire, of two bridges, one with the circular span and the small arch of the earliest period (fig. 4), and the other with the later or pointed style. Judging from the later internal alterations to the Abbey, it is possible to relegate the first bridge to the thirteenth century with very little doubt as to the accuracy of the date, and it may thus be regarded as a typical bridge of the very earliest period. In England, as in Scotland, we see the same ideas of safety weighing in the minds of the early bridge-builders, and arches of small span appear in all the very early structures in England.

Another bridge of the same type as the earlier bridge at Fountains, but somewhat larger, is Kilgrim Bridge in Yorkshire, beside Jervaulx Abbey; but in connection with it there is a remarkably ingenious raised footway on small arches on the embankment at the northern approach to the bridge, so that, in the event of the river rising even to the level

of the crown of the arch, foot passengers could still cross the valley and reach the bridge.

The old London Bridge was an excellent example of early builder's work. Its history is typical of the vicissitudes of most ancient bridges. In 994 its destruction is an incident in a fight with the Danes; in 1008 it again suffered demolition; and in 1091 it was swept away. In 1136 its successor was destroyed by fire, and, to take its place, in 1163 another bridge was built. The great stone bridge was begun in 1176 and com-



Fig. 4. Old Bridge at Fountains Abbey (Yorks.), 12 feet span.

pleted in 1209. Five arches of this bridge fell in 1282 and two in 1437. In 1504 six houses on it took fire; while in the great fire in 1632¹ the buildings on the northern end were burned. Extensive repairs were executed on it from 1757 to 1770, and finally it was replaced by the new London Bridge and taken down in 1831. Structurally the chief point to be noted about London Bridge is that, though the bridge was 926 feet in length, its twenty arches were on the average only 30 feet span—a fact which appears to demonstrate emphatically the limit of size of span of that early period. If a larger span had appeared feasible to the builder, a much clearer waterway would have resulted, and it is the limited span of this and so many others of the same period that makes it extremely unlikely that other bridges attributed to near the same period should have arches of nearly 100 feet span.

¹ These were not rebuilt, so the bridge did not suffer in the greater fire of 1666.

THE TRIANGULAR BRIDGE.

There is one example of this early class of bridge which deserves special notice, because it is referred to in many books as the oldest bridge in England—the triangular bridge at Crowland (figs. 5-6), near Peterborough. It stands at the end of a broad main street of the little town, close to a house at the cross roads, with no river near it. It is explained that two rivers once met at this point, and that the third arch carried the conjoined streams away to the sea. But if one looks at the position of the houses, the explanation does not seem adequate, because any stream or drain—for it is flat fen country—that came down could be more easily crossed by a plank, and the steepness and narrowness of the access do not suggest that it was for regular use. One is therefore forced to the conclusion that it is a memorial of some kind—possibly a novel form of town-cross or observation point from which edicts could be read in connection with the adjoining Abbey; and in this respect the carved statue at the one end clearly suggests clerical influence. Although the triangular bridge is said to be mentioned in A.D. 863, the present one is generally thought to have been erected about 1300, and it owes its excellent state of preservation to the fact that no wheeled traffic passes over it.

THE RELATIVE AGE OF BRIDGES.

When we come to look closely into the question of the age of many of these more ancient bridges, we are greatly handicapped by the fact that, though references to them occur in early documents, there is no certainty as to whether the present bridge is referred to or not, while some of the statements have to be accepted with hesitation. For instance, Leyland mentions that the bridge at Barnard Castle had three arches in 1540, but it has now only two, and we have to take the statement as fact, making the mental reservation that Pierce Bridge, a little further down the river, has three arches, and some confusion might have occurred.

But when we come to tabulate the dimensions of a fairly large group of ancient bridges we find a remarkable coincidence in the almost uniform size of the span of the arches in the early periods, and one might say that their relative age appears to be a matter almost entirely determinable by the length of the span. Taking a representative selection, it is remarkable in how many cases a span of 30 feet is used, and these seem to belong to the period preceding 1350. It will also be observed that a 32-foot arch appears to be the limit of the span in the

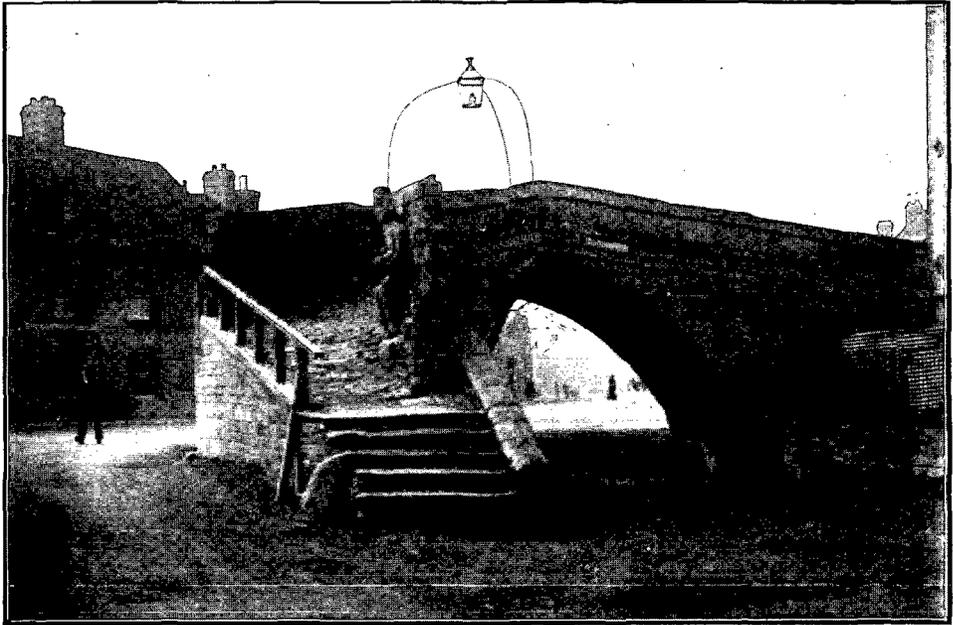


Fig. 5. Crowland Triangular Bridge (near Peterborough).

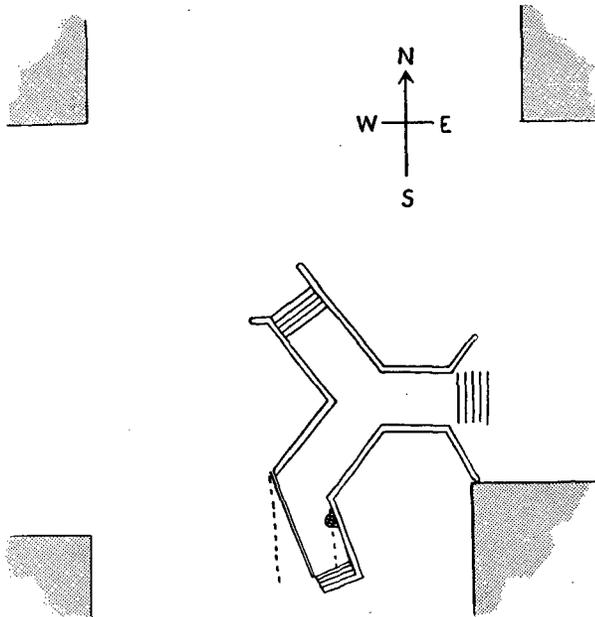


Fig. 6. Plan of Crowland Bridge and its relation to the intersecting streets.

early periods, following which there seems to be a gap, for the next spans are all over 37 feet. The difference between these two groups is so marked, that one naturally feels that there must have been some long period of inactivity in bridge-building, for it is incredible that such a remarkable circumstance should merely be chance. Looking at the preponderance of small-arched bridges, one turns with some scepticism to the fourteenth-century dates assigned to spans of 60 and 90 feet, when all the known facts point to a later period of design.

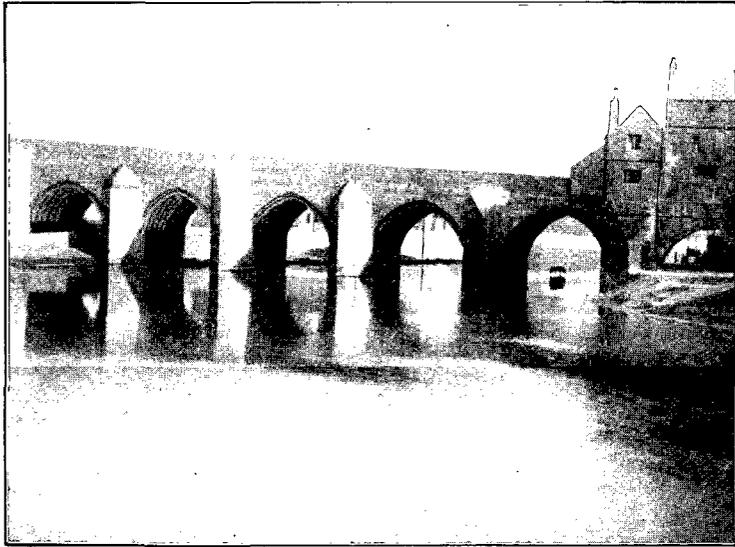


Fig. 7. Elvet Bridge (Durham), 27 feet span.

One of the most striking of such instances is at Durham, where, on the river Wear, at the one side of the cathedral city, Elvet Bridge (fig. 7) (thirteenth century) has a multiplicity of arches of about 27 feet span, whereas the Framwellgate Bridge (fourteenth century), on the other side, and across the same river, has only two arches of 85 feet span. The river is the same width, the two bridges are but half a mile apart, and yet they are supposed to have been built within a century of one another. The explanation probably lies in the fact that piers have been removed in the Framwellgate Bridge and the spans increased. The clearest example of this type of alteration is Eddisford Bridge, near Clitheroe, where a 60-foot span in the middle of a series of 25-foot arches reveals that one pier has been cleared away and two arches have at some period been made into one big span. The position

of the missing pier is clearly seen in the river bed, where a rock shows the spot on which it stood.

The list of bridges here given, though consisting almost entirely of those in Northumberland, Durham, Cumberland, Westmorland, Yorkshire, and Lancashire (the lists of which are practically complete), contains a few others in various parts of England.

Bridge.	Spans.	Remarks.
	feet.	
Fountains Abbey (3), Yorks.	10½-12	
Fountains (Mill) (2), Yorks.	20	
Crowland	16	943-1300 reputed.
Kilgrim (4), Yorks.	21	
Ripon (9), Yorks.	21	not ribbed.
Eddisford (4), Lanc.	24½	
Elvet (? 8), Durham	27	1225 reputed.
Eaglescliffe (6), Durham-Yorks.	30	1350-1400 reputed.
Eamont (3), Cumb.-Westm.	30	
Otley (9), Yorks.	30	1673.
London	30	1209 known.
Wakefield (9), Yorks.	30	1340 reputed.
St Ives, Hunts (6)	22-30	
Warcop (3), Westm.	30	
Kildwick (4), Yorks.	19½, 30, 34	1330 reputed.
Sunderland (4), Durham	31½	before 1346.
Wilton (Ross), (6)	28-32	
Monno, Monmouth (3)	27½-32	
Paythorn (2-3), Lanc.	32	
Chester New (4), Durham	29-32	<i>circ.</i> 1350.
Hereford (6)	27-32	
Settle (2), Yorks.	37½-40	
Wensley (4), Yorks.	37	<i>circ.</i> 1340.
Croft (7), Yorks.-Durham	38	1673 : dated stone.
Cotherstone (1), Yorks.	40	
Topcliffe (2), Yorks.	48	
Devil's (3), Westm.	55	1633 : dated stone.
Barnard Castle (2), Yorks.-Durham	45-57	1596 : dated stone.
Warkworth (2), Northd.	60	1379 reputed.
Borobridge (3), Yorks.	54-60	
Framwellgate (2), Durham	85	1125, rebuilt <i>circ.</i> 1390.
Twizell (1), Northd.	90	1570 reputed.
Bishop Auckland (2), Durham	90, 98	1388 reputed, no ribs.

The number of arches is shown in brackets.

The above list consists of the bridges at present existing with ribbed arches, and the measurements are those of the spans which clearly show antiquity. Eaglescliffe Bridge, for instance, has larger spans than that given, but they are not ribbed and are clearly of a totally different period; Hereford (fig. 8) also displays almost every conceivable type of arch, but the ribbed arch is of the dimensions given.

In addition to these bridges, a number have been removed, the most important of which were the one of ten arches at Newcastle (first referred to *circa* 1150), almost totally wrecked in 1771; and that at York, 70 feet span, taken down about 1820.

Those named are not all the earliest bridges in the North of England, for there are very early references in literature to Haydon Bridge on the Tyne, as well as to the one at Corbridge beside the Roman city. The latter is referred to in 786 in the Chronicle of Melrose; is named in 1150; rebuilt in 1235; and definitely mentioned as being of timber when it had to be repaired in 1299. It is then spoken of as the only bridge on the river above Newcastle. The present stone bridge has a stone dated 1764, and this is generally given as the date of its construction. Berwick Bridge is mentioned in 1199 as having been swept away, and in the

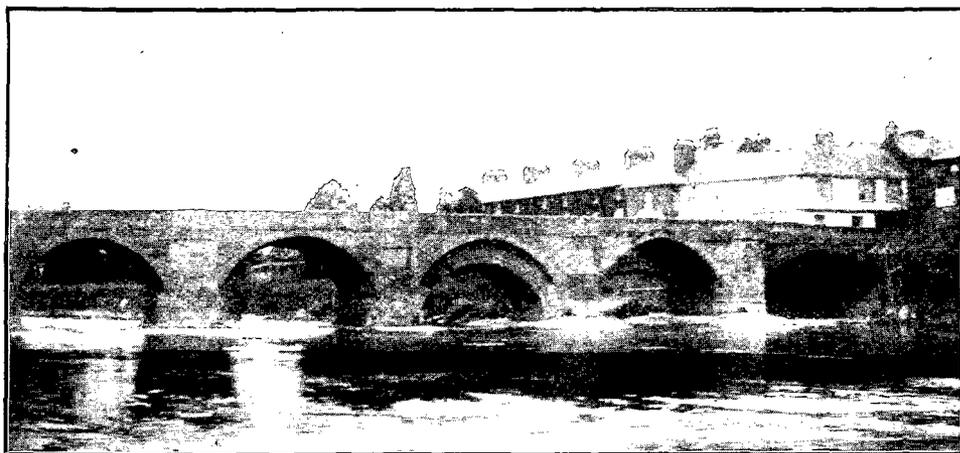


Fig. 8. Hereford Bridge, 27 to 32 feet span, showing arches of different styles and dates.

Chronicle of Lanercost it is stated that the stone pillars were overthrown by a flood in 1294 and people thrown into the water: it is also referred to in the Scalacronica as having been overthrown because the arches were too low. These three bridges came into considerable prominence in early history, as they seemed to be the points to which the raiding armies directed their way, and they then had an importance far beyond their local usefulness. All seem to have been constructed and reconstructed.

It is a feature of the English bridges, as distinct from those in Scotland, that as the southern rivers moved more slowly, destruction from floods was of less frequent occurrence. The mending and patching of the older bridges has been carried on to such an extent that the majority of the old English bridges are, in detail, a heterogeneous mixture of the ideas of different periods, and one can pick out arch by arch the different patchings to which they have been subjected. The two best examples are probably those at Hereford and Yarm, for

in each case one can see evidences of almost every period from the thirteenth to the nineteenth century.

A word of caution is necessary in regard to many of the statements about bridges that are printed in different books. Undependable references have crept into much of the antiquarian and other literature, and one has to exercise a considerable amount of discretion before trusting even to printed statements. One of the best examples of this occurs at Barnard Castle, where all the guide-books give the date on the bridge as 1569, whereas it is 1596—evidently one has copied from the other, or all from the same erroneous source. Eaglescliffe Bridge, according to another authority, was removed and rebuilt of iron. The old stone bridge is still there, but iron girders have been used to widen it. Otley Bridge is also spoken of as having been washed away, but one is incredulous of this, as so many old arches remain. One would be inclined to put down the number of arches broken as two out of seven.

GATEWAYS.

In regard to these early bridges, a reference must be made to the gate which spanned the centre of almost all these old structures, for defensive or fiscal purposes. It was formerly the custom to have a gateway in the centre or at the end of most of the important bridges, in some cases for defensive purposes, in most for toll; but almost all of these gateways were taken down in the coaching period, when they formed a rather serious obstruction. Of this type there is now only one left, that at Monmouth (fig. 9), and it is to be hoped that every effort will be made to retain this picturesque, if inconvenient, access to the town.

At St Ives (fig. 10), in Huntingdonshire, the toll-house in the centre of the bridge remains, but there is no gate, and the date on the lintel of the house, 1736, shows that the present building is of no great antiquity. The bridge itself is very ancient, but has been remodelled and rebuilt from time to time, as is evidenced by the different styles of masonry.

A bridge of unique type is that at Ambleside, where a complete house has been built occupying the whole arch; and although the bridge is only 9 feet wide and 22 feet span, the house has an upper story. It would appear as if, when the new bridge was completed, the old bridge had been sold to a frugal person, who erected a house on it free of questions of the land proprietor. The bridge, which is of ordinary rubble masonry, shows no great signs of antiquity, and is probably somewhat over a hundred years old.

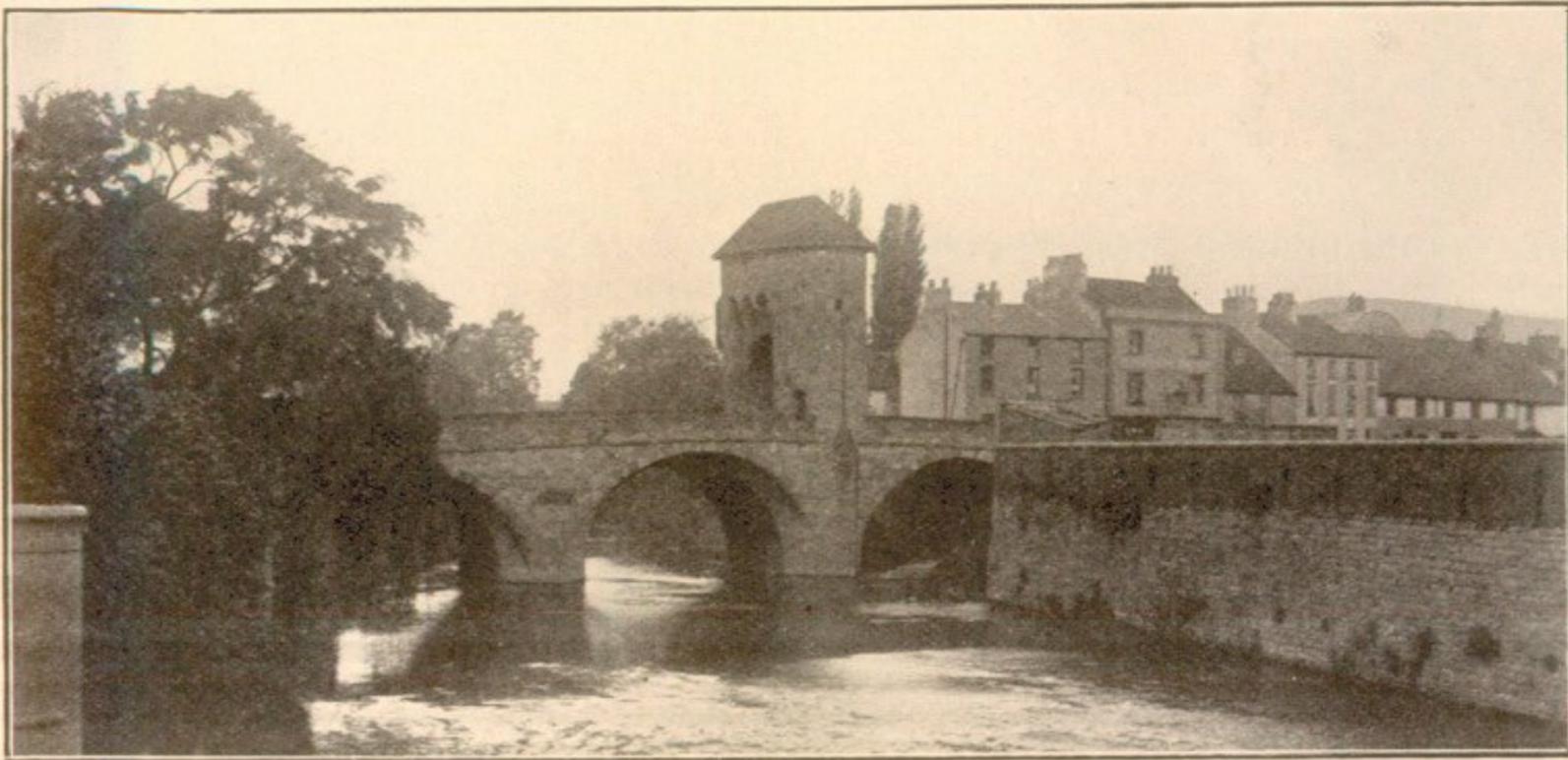


Fig. 9. Monno Bridge (Monmouth), $27\frac{1}{2}$ to 32 feet span, with gateway—the only specimen left in England.

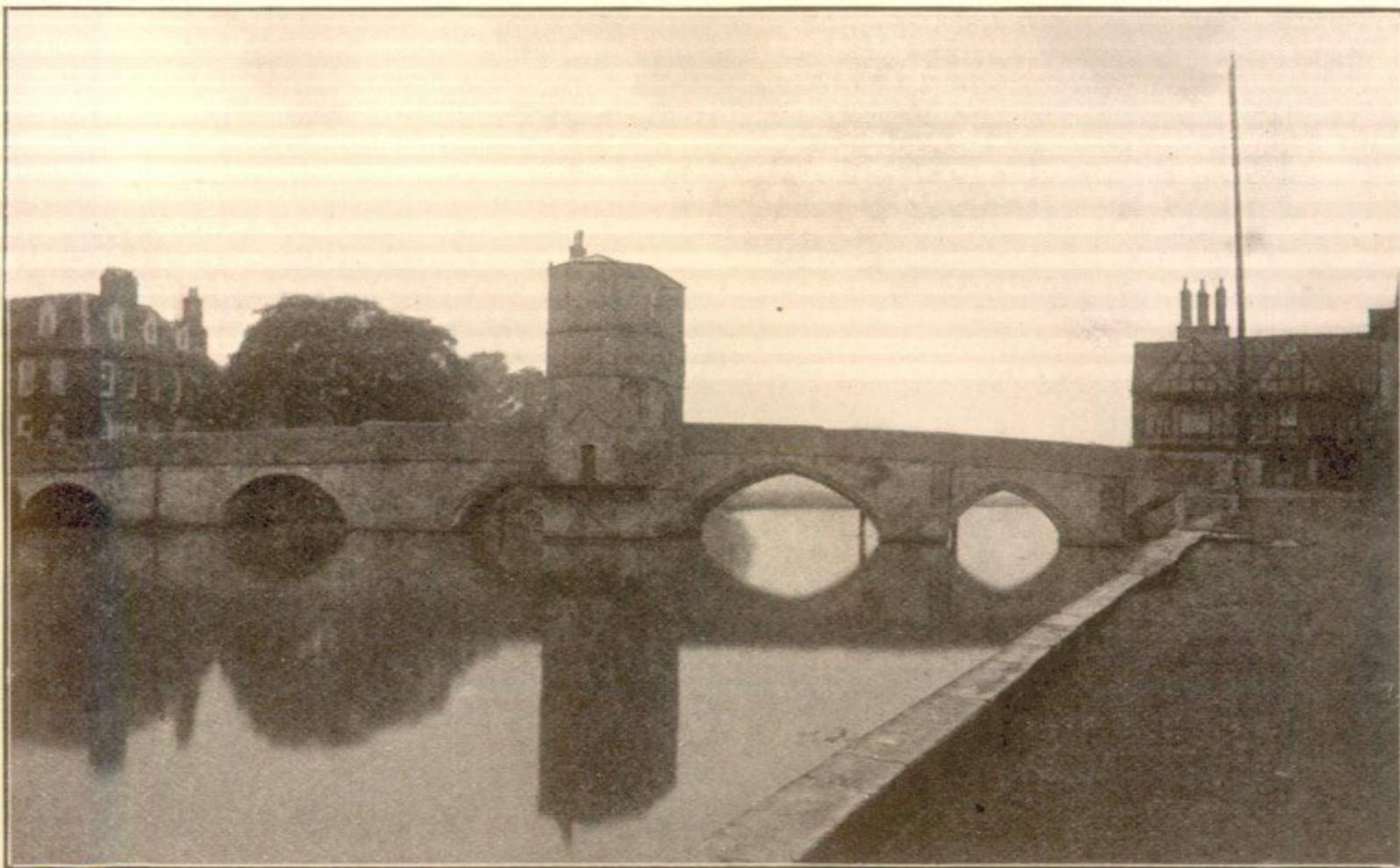


Fig. 10. St Ives Bridge (Hunts.), 22 to 30 feet span, with house dated 1736.

ANCIENT SCOTTISH BRIDGES.

While it is noticeable that the ribbed bridges constitute, almost without exception, the earliest form of bridge in England, it is remarkable that the ribbed bridges in Scotland, whose dates are known, all seem to come within the period from 1520 to 1540, and this fact makes one hesitate to place the style at such an early date as in England. There are at present fourteen bridges of this type remaining, and, placing them according to the size of the span in the same fashion as the English bridges, the result is as follows:—

Bridge.	Span.	Remarks.
	feet.	
Tullibody, fig. 11 . . .	18½	
Pencaitland	18	
Roberts (Dingwall) . . .	20	1540-1560.
Dairsie	26½	1530.
Jedburgh	30	
Avon (Hamilton), fig. 12	34	
Cramond	36-38	
Abbey, Haddington . . .	38	
Linton, East	43	
Bothwell	45	
Dee (Aberdeen)	46	1527.
Maiden (Newbattle) . . .	50	
North Water	51½	1539.
Gannochy	65	1732.

In addition to these, quite a number of ribbed bridges have been demolished at various periods, the most important of which were those at Inverness, Leith, and Hawick. In addition, there are a couple of insignificant bridges across a mill-stream near Melrose Abbey, each with a span of about 12 feet. Commenting upon the above references, the facts all point to these structures having been erected between 1480 and 1540, and it is remarkable how the type so universal in the fourteenth century in England, does not appear to have been much in use until the sixteenth century in Scotland.

THE OLDEST SCOTTISH BRIDGES.

Although Stirling Bridge is mentioned in history at an early date, yet it is the Bridge of Perth of which we have the earliest authentic evidence. It is first referred to in the Inchaffray Records, p. 50, in the year 1202, and in 1210 is known to have been overturned in a flood. Its chequered career is mostly contained in the Chronicle of Perth, *Musæ Threnodie*, and Frith's *Ecclesiastical Annals*.

In 1228 we come across a reference to a stone bridge over the Spey at the place where the Highland Railway now crosses that river

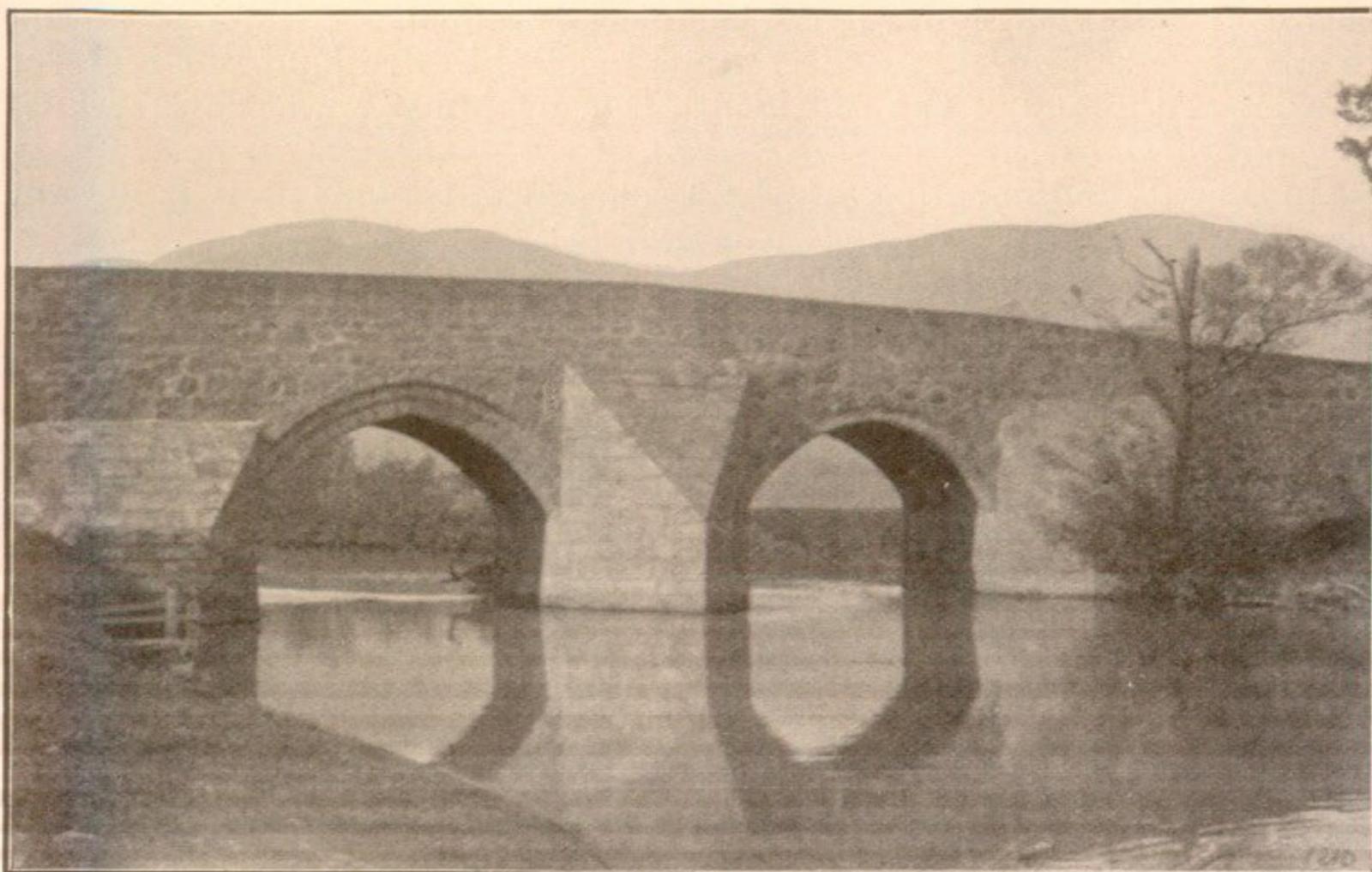


Fig. 11. Tullibody Bridge (near Alloa), $18\frac{1}{2}$ feet span.

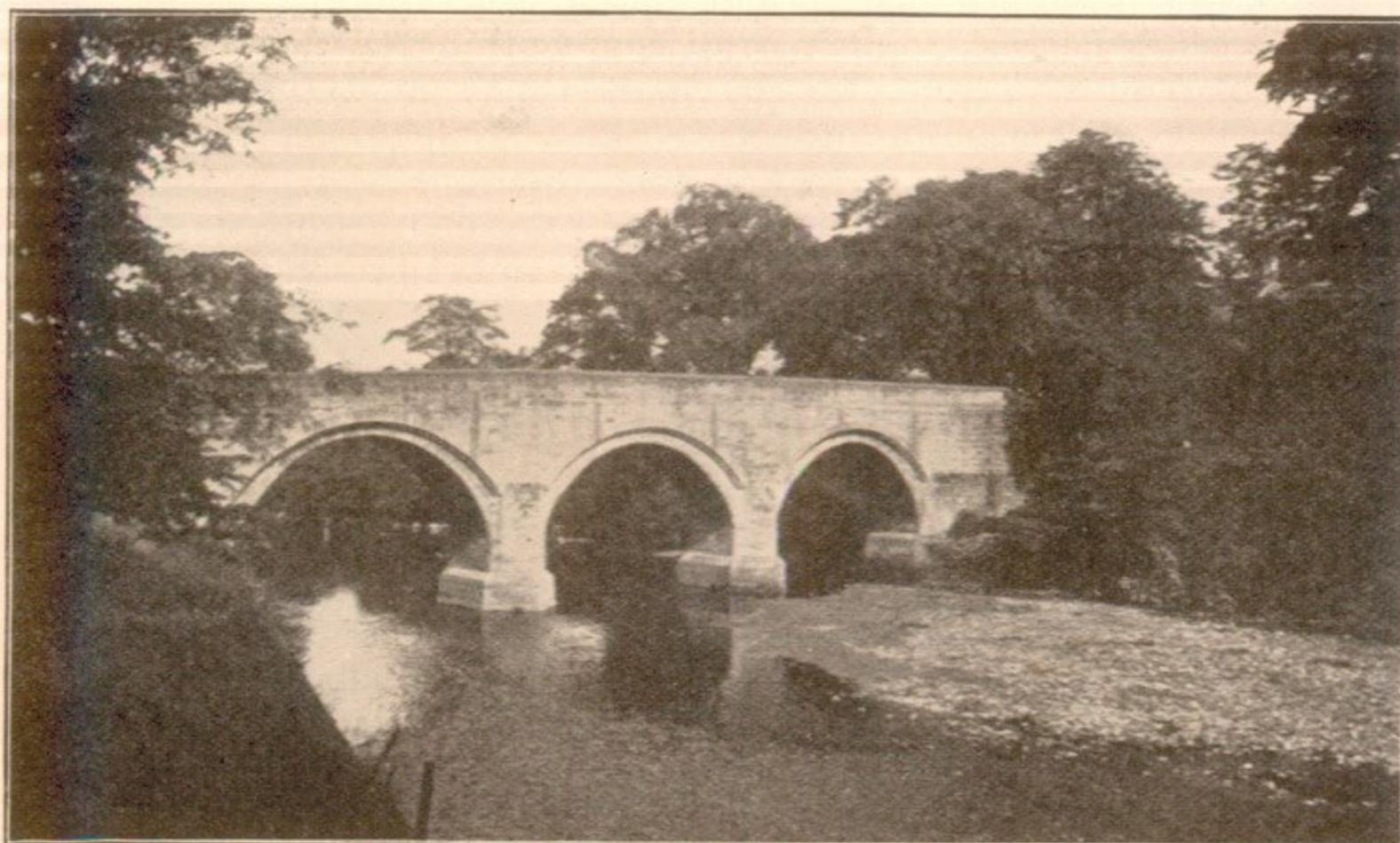


Fig. 12. Avon Bridge (near Hamilton), 34 feet span.

between Keith and Elgin. The place is called Boat of Bridge. It seems to have been one of the earliest stone bridges in Scotland, but it ceased to exist at the end of the fourteenth century, and it was never rebuilt (*Registrum Moraviense*, pp. 107 *et seq.*).

In 1218 I find mention of the Bridge of Brechin, but it is not the present one (*Registrum Brechinensis*, 271/224).

In 1236 the Brig of Ayr is named, but it appears to have been a temporary predecessor of the present structure (*Burgh Charters*).

In 1234 the Brig of Ettrick is mentioned (*Liber de Calchou*, 309). This is usually identified with the present Ettrick Bridgend, seven miles above Selkirk. I would, however, be inclined to make the suggestion that it is unlikely that this refers to a bridge in the Hunting Forest of Ettrick, as the reference is to the meeting of a justice eyre. Looking to probabilities, I think we must seek for the site of this bridge somewhere close to the modern bridge at Lindean, as the number of old roads converging at that place suggests it as the most likely spot. This bridge must have been washed away long before Scott of Harden built his bridge at Ettrick Bridgend in 1653.

In 1260 the Bridge of Dunkeld is referred to (*Cart. Cambuskenneth*, 268/184). This bridge must have been short-lived, as we read of it being built again of stone and timber in 1461. It is referred to as once again being built in 1513, and this time one stone arch was completed (*Lives of Bishops of Dunkeld*). The bridge appears on Timothy Pont's manuscript maps of Perthshire about 1619, but nothing further is known of it. In common with the two previous bridges at the same place, it seems to have disappeared altogether.

In 1272 the Bridge of Cart is referred to (*Regist. Passelet*, 51), and is assumed to be the one at Paisley. It is extremely probable that this also was a timber bridge, as the old bridge removed about 1850 does not appear to have been built much before 1600.

In 1285 the Brig of Clyde is mentioned (*Regist. Passelet*, 400), and, although no definite locality is given, it appears to be Glasgow Bridge. There is, however, a curious mark in one of Timothy Pont's manuscripts indicating a bridge over the Clyde at Carmyle, and in this case one observes old roads leading down to the point at which it was supposed to cross, showing that a bridge at this site is not an improbability. The old Bridge of Glasgow is generally supposed to have been built by Bishop Rae in 1345; but the evidence of this is so slender, and the facts point so much to a later date, that one must assume that Blind Harry's statement, that it was of wood, was accurate in every way.

Stirling Bridge, referred to in a document dated 1296 (*Calend. Doc.*

Scot., 186), has been dealt with in a previous paper very fully, but it also appears to have been of wood at that period.

IRISH BRIDGES.

In Ireland the building of stone bridges does not appear to have been undertaken in early times, for I have failed, so far, to come across any stone bridges of earlier date than the eighteenth century—they have either been replaced, or the old ones were of wood. The explanation may in some degree arise from the absence of Roman influence and example—there are no “Roman” bridges in Ireland; but the fact that Drogheda (a form of the Gaelic *drochaid*, a bridge) was the name of the town at a very early date, shows us they existed at a very remote period. There is a very early reference (1159) to a bridge at Athlone over the Shannon, but it is specially named as a plank bridge; while the wooden one at Killaloe was destroyed in 1170.

LATER BRIDGES IN ENGLAND.

The period of the seventeenth century appears to have been marked by some bold efforts to erect large bridges, and in County Durham in particular one sees a triple-ringed arch that looks most massive and strong. It is a type unknown in Scotland, and I have so far seen it nowhere else either in England or Ireland. One of the best examples of this construction is at Barnard Castle (fig. 13), where the two-arched bridge of 45 to 57 feet spans shows great strength. It is dated 1596. The same construction is shown on the splendid two-arch bridge spanning the Wear at Bishop Auckland, where 90 and 98 feet spans carry the road across the river. This bridge is ascribed to the date 1388, but one is hardly inclined to accept such an early date for two large spans, when all the old bridges in the neighbourhood of that period are of the usual small span.

Another type of bridge of which there are a fair number in England, but hardly any in Scotland, is the packhorse bridge. The roadway is only from 4 to 5 feet wide. They correspond in some degree with the bridges of the Church-bridge period in Scotland, but are much narrower and have a heavy parapet. They are usually of one large arch, and one of the best of the type is seen at Dob Park near Otley, and at the Beggar's Bridge near Whithy. They appear to have been built for the packhorse traffic mostly in the seventeenth and eighteenth centuries, and the only one I have seen in Scotland resembling them is the narrow bridge in Alyth, where the same heavy parapets appear.

The eighteenth-century developments of bridges largely consist of

an increase in the size of the spans; and in the nineteenth century, in the massiveness and solidity of the structure.

One of the most instructive facts, however, in the relation of these early ribbed structures to those of the later periods is that the ribs or rings were originally the solid part of the bridge, and the arch was no

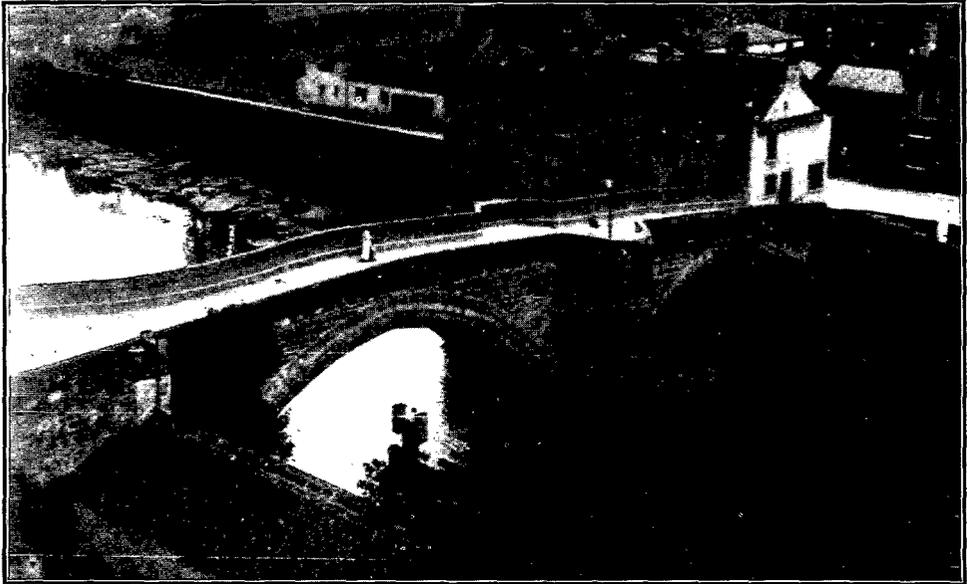


Fig. 13. Barnard Castle Bridge, 45 to 57 feet span, 1596.

more than a covering of stones to these rings. Later the arch itself became the substantial part, and the rib dwindled merely to an ornament or a secondary support, and finally disappeared altogether.

It was therefore a remarkable fact that when the first iron bridge was constructed at Colebrookdale in Shropshire in 1777, the ribbed type of arch was faithfully reproduced in iron as in the primitive structure, showing the inherent strength and usefulness of the original design in stone.