

# The National Intelligencer,

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### IRON BRIDGE.

An account of the improvement of the *Piers of London, and more particularly of the intended Bridge, consisting of a single arch of six hundred feet span.* (Philos. Mag.)

Nothing tends so much to promote the improvement of a state, as the establishing of an early and uninterrupted communication through all its districts. It has therefore been a leading object with every well-wisher of his country, to render the general intercourse as perfect and convenient as possible. Public roads and bridges have been the means chiefly employed to establish this intercourse; bridges, as requiring scientific and mechanical knowledge, and in many cases, the utmost exertions of talents and skill, have frequently engaged the attention of persons of eminence and learning.

It would be an amusing task to trace the progress of this useful art, from the rude efforts of the savage, in his unutilized fields, to the magnificent works of civilized nations, when science, wealth, and increased population, have united to overcome difficulties considered before as unassailable.

When a work is to be performed, mankind, at first, make use of the materials which are nearest at hand, and which require the least skill in the preparation. Timber and stone were therefore the materials with which bridges were first constructed, and those edifices have been rendered more or less perfect, in proportion to the quality of the materials, the nature of the soil, and the degree of wealth and power in the countries in which they were erected.

In our oldest bridges, it is evident, there has been much similarity, from the small portion of *fill*; in deep water, the lower parts of the piers have been constructed with timber, and the masonry begins to take place at the line of low water; and the arches are of narrow span, and the masonry employed in them is frequently composed, partly of rubble, and partly of squared stone. The three of these were devised (by *alting* *cliff* *dam* and *iron*) to place the masonry as low, as possible, to the natural level of the river; the arches were also formed of a bolder joint, and the masonry was made much more perfect, being all of squared stone. In this manner, bridges have been constructed in Italy, France, and the British Isles, which have justly been considered, not only as works of general utility, but of great magnificence.

In like manner, timber bridges have been gradually improved, from the rough trunk of a tree thrown across a small stream, to the bold and ingenious labours of the Swiss carpenter at Schaflhausen.

Bridges continued to be chiefly composed of timber or of stone, until the year 1790, on account of economy, in some cases, they have been built with brick.

Metals not being generally found in a pure state, require much labour and expense to make them fit for the purposes of man, and therefore in the unutilized periods of society were not applied to works of great magnitude; but the important improvements in chemical and mechanical knowledge, have, in a great degree, removed those difficulties, and rendered them not only the most powerful, but the most useful means of man. Iron being the most abundant, cheap, and generally useful, of all the metals, has, of late years been applied in all works where great strength was required, in proportion to the weight of the material. Hence cylinders, beams and pumps for steam-engines, boats and barges for canals and navigable rivers, breast and piles. Mr. John Wilkinson has constructed boats and barges of iron, some of which are on the river Severn, and the others upon the canals in Staffordshire and Worcestershire.

A large manufactory for iron and brass, introduced by machinery worked by a steam-engine, has been erected at Shefford by Messrs. Marshall, and Bage, who have also introduced the use of *blast*, and a road composed of brick roads, which are supported by cast-iron

bars for large buildings and bridges have been constructed of iron.

The first iron bridge we know of, is over the river Severn, near Coalbrookdale, in Shropshire; it consists of one arch 110 feet and six inches in the span, and rises 43 feet; there are five ribs, each cast in two pieces, secured where they join at the crown of the arch by a cast-iron key plate, and connected together horizontally and vertically, by cast-iron braces, formed with dovetails and fore-looks; the ribs are covered with cast-iron plates, and the railing of the sides is of iron; the total weight of iron is three hundred and seventy-eight and an half tons. The project's being carried into execution was chiefly owing to the genius and exertion of Mr. John Wilkinson and Mr. Abraham Darley, iron masters, whose scientific knowledge and extensive practice, in all that regards the manufacture of iron, have long been known to the public. The bridge was built by Mr. Abraham Darley, and the iron work was cast at Coalbrookdale in the year 1779.

It was a bold effort; for, in the first instance, the use of cast-iron materials, they exceeded the span of the centre arch of Blackfriars bridge, which had been considered as a great exertion with bridge.

The iron work of this bridge has fully justified the idea of making use of that metal; for it is at this time as perfect as when it was first put up, except the creaking of some of the four pieces, owing to the riveting way of the abutments of stone, which, it is to be regretted, were not made sufficiently strong to oppose the great mass of alluvial earth, to which the very high and deep abutment banks are composed; for, if these abutments had been fortunately built on the coal measures, no such risk could have taken place.

The second iron bridge, which we know of, is over the same river, about two miles above the former one, at a place called Buildwas; it was erected at the expense of the county of Salop, agreeably to a plan, and under the direction of Mr. Telford, who is employed as surveyor of the public works of that county; it was also cast at Coalbrookdale in 1793 and 1795. It consists of one arch 120 feet in the span, and rises, from the springing to the soffit of the arch, 27 feet. In this bridge, as it was necessary to keep the roadway as low as possible, the principle of the Schaflhausen bridge was made good; as for the outside ribs are made to go up as high as the tops of the piers; they are connected with the ribs that bear the heaviest weight by means of pieces of iron, dovetailed in the form of king-pieces. The plates which form the covering over the lower ribs are cast with top flanges, are laid close to each other, and form an arch of themselves, so that, altogether, the bridge is compact and firm. The weight of iron is 173 tons and 1/2 cwt. Some smaller bridges, and an extensive canal at Longford, in the county of Down (over a navigable canal) have also been made under Mr. Telford's direction, in Shropshire.

The next bridge, on a large scale, which was made of iron, was that over the river Wear, at Monkwearmouth, in the county of Durham. This bridge is 236 feet in the span, and rises only 34 feet; it is composed of very stout cast-iron frames, which are connected together by bars of wrought iron, and rib-rows with flanges and screws; the ribs are covered with timber planking. The weight of cast iron used in this bridge is 805 tons, hammered iron 55 tons. This bridge was built under the direction and chiefly at the expense of Robert Stephenson, Esq. who has also a manufactory of Messrs. Walker, of Northumberland, in Yorkshires, and does much labor for the projector and to the iron masters. It was a considerable feat in the practice of bridge-building, being nearly double the span of the arch of Buildwas, and more than double that of the centre arch of Blackfriars bridge. It will, perhaps, appear rather singular, that we have not an opportunity of considering the qualities of iron, or who have not carefully compared its strength with the strength of the materials formerly used in construction, to be so great works as to proper we

should proceed with caution; but the very principle of improvement must be wholly abandoned, if the demonstrations of genius and the evidence of practical knowledge are to be disregarded. To those who will take the trouble of comparing the specific gravity and the strength of cast iron with those of iron, it will not appear extraordinary, that by using that metal, the practice of bridge-building may be changed, and the opening of archways made to extend far beyond what has hitherto been attempted. The advantages to be derived from this practice are obvious, and become of great national importance in every country where the free navigation of rivers is intimately connected with its prosperity.

We have been led into the consideration of this subject by the information we have received respecting the plans for re-building London bridges. Understanding that there was a plan for constructing a bridge over the Thames of a single arch of cast iron, we have made particular inquiries, and have authority to say that the following is a correct statement of the history, principles, and advantages of the proposed plan.

The manufactures, trade, and commerce of Great Britain having increased to an extent unequalled in the history of nations, a great proportion of which is carried through the metropolis, by means of the fine river upon which it is situated, and the important centre it forms for the commerce of the rest of the world; although this river forms an excellent channel to suit the intercourse of ships of the large burden within a few miles of the city. Yet from the increase of the number and size of the vessels frequenting the port of London, great inconveniences and losses have been experienced in transacting the business connected with the shipping. The dilapidation of which the late ships are obliged to lie, the confusion of shipping in the River, the loss of time in loading and discharging goods, the expense of lighters, the frequency of collisions, the delay and vexation experienced by the merchant and manufacturers, have at length given rise to propositions and plans to remedy these evils. On this great national subject, which embraces a vast variety of objections, opinions have, of course, been various, and some of them contradictory; this produced much difficulty while the business remained with an open Committee of the House of Commons, and, although much useful information was obtained, yet no project appeared to be finally agreed on, and brought to maturity.

This led to the judicious measure of appointing a select committee, consisting of members who were not concerned in any of the projects brought forward. This committee has made three most valuable reports to the House of Commons, wherein every thing relative to the port of London, and the general commerce of the kingdom, as far as it respects the river, has been considered, and the best plan has been arranged with an accuracy and precision which will enable the legislature and the public to comprehend, at one view, a subject which has hitherto been beyond the power of any individual to bring together.

In this great plan, they have judiciously divided the port of London into three parts, the first is the docks in the Isle of Dogs, which are calculated to accommodate the West India trade, which, usually arriving in large fleets, contributed in a peculiar degree to the crowded and embarrassed nature of the river, and which, from the valuable nature of their cargoes, were very much exposed to depredation. These docks, in this plan, are to be a canal, by means of which the goods shipped shall be to call upon, may avoid the circuitous route by Greenwich and Deptford.

[Remainder in our next.]

### For Sal or Rent.

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NICHOLAS FOSS.

### Foreign Intelligence.

LONDON, Sept. 7.

The following is an ordinance issued at Vienna, relative to the new fashion:—His Royal Highness the Archduke Charles, having learned with the greatest displeasure, that several young men in service dishonour the duties confided to them, as lieutenants of the fleet, in following the most ridiculous fashions, such as hats without a leaf, crooked heads, neck-handkerchiefs enveloping the chin, pantalons, and breeches (carefully covering the toes of the feet)—His Highness having ordered in the strictest manner that all the persons belonging to the Council of War do leave off, from this moment, this indecent fashion, and that they themselves as becomes men in the service of the fleet; and the direction of the protocol of the Council of War is charged to notify this order, to the persons in employment under it, so that they may conform thereto, and that his Royal Highness may not see himself constrained to have recourse to rigorous measures against those who should rather violate this regulation.

September 10.

In the beginning of last month the Janissaries at Belgrade mutined, and compelled the Pacha of that place to throw himself into the citadel, with a small number of officers and men who remained with him. He was obliged to give a formal declaration in favour of Pashaw Oglou. Soon after, however, one of the old soldiers of the Janissaries apparently full of conviction at this favourable declaration of their history, duty and allegiance, sent an act of submission to the distressed Pacha, who received it joyfully. He then fled, and returned to his former residence in the city. But in the night of the 14th ult. many of the mutineers found means to get into Belgrade, in troops of from ten to twenty, and a new rebellion broke out, which forced the distressed Pacha to seek again refuge in the citadel, where he expected to be attacked; the number of his followers had now greatly diminished. The whole city of Belgrade was in terror and consternation; and many merchants and rich Turks fled with their goods and valuable property to Constantinople. The rebellion, if not politically avert, that the rebellious Janissaries had been actually bombarding their Pacha in the citadel ever since the 17th ult. and, when these accounts came, a few had broken out in several places. A corps of Pashaw Oglou's troops was then on its march to join the rebels. The Turkish merchants who remained, were no longer permitted to convey away any of their goods; but the Greeks from Wallia, and Austrian subjects, were respected, and at liberty to dispose of their property as they pleased.

Dispatches were received of great importance, were received by Mr. Otto, and communicated to ministers. It was yesterday reported with confidence that the negotiation in the action is now terminated; if not absolutely at an end; and locks experienced a deprivation of above one per cent. There was a rumour likewise that Mr. Adair's resignation was being considered. Mr. Pitt was again coming in. It is true that the negotiation is really at an end, we shall not be surprised to see Mr. Pitt's resignation being considered. If the negotiation be not entirely off, we believe it will not last long. We see very little hopes of its success.

LONDON, September 12.

The East-India Company have received letters from Barker, their agent at Aleppo, dated the 15th July, conveying the substance of private advices received there from Cyprus, down to the 7th of the same month.

Mr. Malley's ship Disdem had arrived there from the coast of Egypt, and stated, that at the time of their departure a firing of cannon was heard in or near Alexandria—about a dozen defenders who had succeeded in quitting Alexandria in a boat,