

www.e-rara.ch

A treatise on bridge architecture, in which the superior advantages of the flying pendent lever bridge are fully proved

Pope, Thomas

New York, 1811

ETH-Bibliothek Zürich

Shelf Mark: Rar 912

Persistent Link: <https://doi.org/10.3931/e-rara-9310>

Conclusion.

www.e-rara.ch

Die Plattform e-rara.ch macht die in Schweizer Bibliotheken vorhandenen Drucke online verfügbar. Das Spektrum reicht von Büchern über Karten bis zu illustrierten Materialien – von den Anfängen des Buchdrucks bis ins 20. Jahrhundert.

e-rara.ch provides online access to rare books available in Swiss libraries. The holdings extend from books and maps to illustrated material – from the beginnings of printing to the 20th century.

e-rara.ch met en ligne des reproductions numériques d'imprimés conservés dans les bibliothèques de Suisse. L'éventail va des livres aux documents iconographiques en passant par les cartes – des débuts de l'imprimerie jusqu'au 20e siècle.

e-rara.ch mette a disposizione in rete le edizioni antiche conservate nelle biblioteche svizzere. La collezione comprende libri, carte geografiche e materiale illustrato che risalgono agli inizi della tipografia fino ad arrivare al XX secolo.

Nutzungsbedingungen Dieses Digitalisat kann kostenfrei heruntergeladen werden. Die Lizenzierungsart und die Nutzungsbedingungen sind individuell zu jedem Dokument in den Titelinformationen angegeben. Für weitere Informationen siehe auch [Link]

Terms of Use This digital copy can be downloaded free of charge. The type of licensing and the terms of use are indicated in the title information for each document individually. For further information please refer to the terms of use on [Link]

Conditions d'utilisation Ce document numérique peut être téléchargé gratuitement. Son statut juridique et ses conditions d'utilisation sont précisés dans sa notice détaillée. Pour de plus amples informations, voir [Link]

Condizioni di utilizzo Questo documento può essere scaricato gratuitamente. Il tipo di licenza e le condizioni di utilizzo sono indicate nella notizia bibliografica del singolo documento. Per ulteriori informazioni vedi anche [Link]

CONCLUSION.

LET the broad arc the spacious HUDSON stride,
And span COLUMBIA'S rivers far more wide ;
Convince the world AMERICA begins
To foster Arts, the ancient work of kings.
Stupendous plan ! which none before e'er found,
That half an arc should stand upon the ground,
Without support while building, or a rest ;
This caus'd the theorist's rage and sceptic's jest.
Like half a rainbow rising on one shore,
While its twin partner spans the semi o'er,
And makes a perfect whole, that need not part,
Till time has furnish'd us a nobler art.

The muse with humble flight will now unfold
The myst'ries of a work that ne'er was told ;
Delineate the plan by simple rules,
That those who can't believe may prove they're fools.
One single arc, whate'er the span may be,
Of river, lake, or swamp, or arm of sea,
Is all it needs, so wond'rous is it plann'd,
To form a spacious Bridge from land to land.
The towering poles of navies in full sail
May pass this arc in e'er so brisk a gale,
And ships at anchor ride beneath the arm,
Or moor to shelter'd wharf, secure from harm.
Thus navigation chastely is preserved,
And sons of commerce lose not their reward.

The butment's built of stone, where stone is found,
 For nought can last so long or keep so sound ;
 But if the place should timber only grant,
 Then stone and iron the builder will not want.
 The length of butment's not, as men have told,
 So long to cut a city in two-fold ;
 For rivers North and East may have a Bridge,
 And streets call'd South and West may bound their ridge.
 If half the are a thousand feet demand,
 One hundred is enough upon the land,
 To form the butment and the steelyard's prop,
 Which balances the power, lest it should drop.
 This butment must more gravity possess
 Than flying arm by weight can furnish stress ;
 Consolidation of a mass of stone,
 Or towers erect, like those which China own ;
 But best when butments form a group of stores,
 To house the treasure brought from distant shores :
 The rent they furnish pays the building's cost,
 Which in all other Bridges must be lost.
 The stones that first compose the fulcrum's base
 Are large and massy, but of even face,
 Well bonded by their square and equal form,
 So closely plac'd to leave no room for worm,
 Or spurious matter of a worthless kind,
 That oft is fill'd, in walls, in hopes to bind
 The unconnected parts, which ne'er did rest ;
 These make but cobweb-structures at the best.

The mortar all is ground within a mill ;
 The only labour is the hods to fill ;
 One horse and boy for twenty men provide
 With cement better made, more cheap beside.
 The arms of Bridge are built of stone or wood,
 But iron, cast, would furnish twice the good ;
 Its extra beauty and its lesser weight
 Confound the pride and ignorance of the *great*.
 Combining levers stretch from shore to shore,
 And span the foaming flood ne'er span'd before ;
 By logs of timber plac'd at angles right
 The bold formation is made strong and tight ;
 Each semi are is built from off the top,
 Without the help of scaffold, pier, or prop ;
 By skids and cranes each part is lower'd down,
 And on the timber's end-grain rests so sound,
 That all the force of weight can ne'er divide
 Each tabled timber from its partner's side :
 And, lest the end-grain should not stand the test,
 A sheet of iron 's plac'd between each rest,
 That no compression or indention can
 Make an impression to defeat the plan.

The usual mode of building house or ships,
 Of framing Bridges, tables, purlins, hips,
 'Tis end to side-grain by the ancients plann'd,
 On which their ponderous loads were made to stand ;
 And all the Bridges that were ever built
 Repos'd their weight on ceintre, pier, or stilt.

Not so the Bridge the author has to boast ;
 His plan is sure to save such needless cost ;
 A ladder on each side is lower'd down,
 And shifted from the fulcrum to the crown ;
 Two men on each descend to drive the bolts,
 Wedge fast the trunnels or set taught the nuts,
 Or line with boards the parabolic form,
 Expos'd to weather and the furious storm.
 The lateral shape of Bridge resists the wind,
 By concave circle throws its force behind ;
 The butment on each shore receives the charge,
 Repels with weight the pressure by, and large.
 If shores supply with rock to build upon,
 The builder then hath an advantage won,
 By which he saves the cost that oft ensues
 In sinking coffers, caissons, or mud pews.
 But should some softer strata heave in sight,
 The consequences will be truly light,
 As nothing is more easy to provide
 Than concave circle on the under side,
 By which the pressure will combine to force
 The neighbouring infirm strata much more close ;
 Its watery particles must soon escape,
 And force the solid grains into a heap,
 By which the massy butment rests secure,
 And through its firm foundation must endure.
 Not so the tottering piles of ancient day ;
 When prest by weight they quickly slide away,

Wreck, from the centre to the structure's base,
And all its bond and beauty soon deface.

When Time, with hungry teeth, has wrought decay,
Then what will sceptics be dispos'd to say ?

Why, " down the Bridge must fall, without repair,

" And all the author's pleadings will be air."

Not so, he's better arm'd than you expect,

For nought can bring to ruin but neglect ;

A mean's provided, which can never fail,

To keep up strength whate'er the Bridge may ail :

Each log of wood, where'er its station be,

Is safely shifted for a sounder tree,

With greater ease remov'd than heretofore

A piece could be repair'd in an old floor.

For lasting age this Bridge will far exceed

All others ever built ; they rot with speed.

' But how to reconcile these novel truths

' With what the *Doctors* teach their college youths

' Is hard for us (say some) to understand,

' How timber Bridges can fly off the land,

' Without a prop or scaffold from the strand,

' And meet to join in centre hand in hand,

' Is truly strange and marvellous to me,

' And, till I see it, never can it be !"

Yes, teachers many have their pupils taught

That nothing strange or new can e'er be brought,

But what in ancient times were known or wrought,

So narrow and so mean their scanty thought.

But, base that works of art should judged be
 By fools in skill, who have no eyes to see ;
 Who ne'er by arduous thought, or stretch of mind,
 Trac'd causes old, some new effects to find ;
 Whose stupid life to man was ne'er of good,
 Except it were to eat another's food ;
 And numerous is this tribe, that gain a name,
 But not by works of skill, deserving Fame.

Yet, science has her sons in every age,
 Her babes of skill, her striplings, and the sage,
 And daughters too, on which her hand bestows
 Sublime discernments, that no stranger knows ;
 Though bastards oft intrude and steal the bread
 With which the sons of merit should be fed,
 Array themselves in ep'lettes, swords and gowns,
 And strut about like showmen's drest-up hounds ;
 And if you ask them a new work to view,
 ' Oh, sir ! say they, it never can be true ;
 ' Besides, I have no time to spare, to look
 ' At schemes like these ; they 're not within my book.
 But science owns not such a gaudy train,
 Who can on sons of genius pour disdain,
 Nor *quack philosophers*, who durst decide
 On works of merit they have never tried,
 Nor half-taught theorists, of whatever name,
 Who seek by others' skill to gather fame ;
 Nor wanton sceptics, who can dare condemn
 More worthy works than ever fell to them.

Methinks the sons of art would be too blest
 Were there not men like these to prove their pest.
 What ! though this Bridge surpass all else before,
 Should it be disbelieved e'er the more,
 What finite man, to whom all skill was given,
 That none beside should read the starry heav'n,
 Or find a plan by which to pass the deep,
 While blockheads and their follies rest in sleep ;
 Desery a continent, find out a land,
 Mark out a shoal, make known where lies quicksand,
 Or trace the magnet which to poles directs,
 And, with the quadrant, all mistake corrects ;
 Or cast great guns, whose thunders loudly roar,
 Or make silk ears, philosophers to soar,
 Or Drake's dread fireships, that no quarters give,
 But blast in sunder all, that none survive
 To tell the dismal tale of dire despair,
 That ship, and guns, and men, are blown in air ;
 Or excavate the earth, to float a bark,
 To carry goods through rocks and mountains dark,
 Propel a boat by steam, 'gainst wind and tides,
 That in a calm by others swiftly slides ;
 That travels night and day, like a stage coach,
 Which at the usual time make its approach :
 Or make sweet sounds to soothe some savage breast,
 Or link such words as poets deem the best,
 Or carve some marble that shall stamp renown,
 Or paint some golden scene that fame shall crown,

Or build this flying Bridge, the author's boast,
 Or thousand other schemes now gone and past,
 Or thousand things to come, that none e'er knew,
 As time rolls on, invention shall prove true :
 If these were all design'd for one man's work,
 The other sons of art in caves might lurk,
 And mourn their useless state, as lost to fame,
 Compell'd to live and die without a name.
 ARCHIMEDES foretold the lever's power,
 How he could with a pole upset a tower,
 Or raise the globe, if fulcrum were but strong,
 Sufficient for to rest his lever on.
 The author's Bridge shall surely rise to fame,
 In spite of envy's efforts, power, or claim,
 And men of liberal science own its worth,
 Respect his name and cultivate its growth.

T. POPE.





