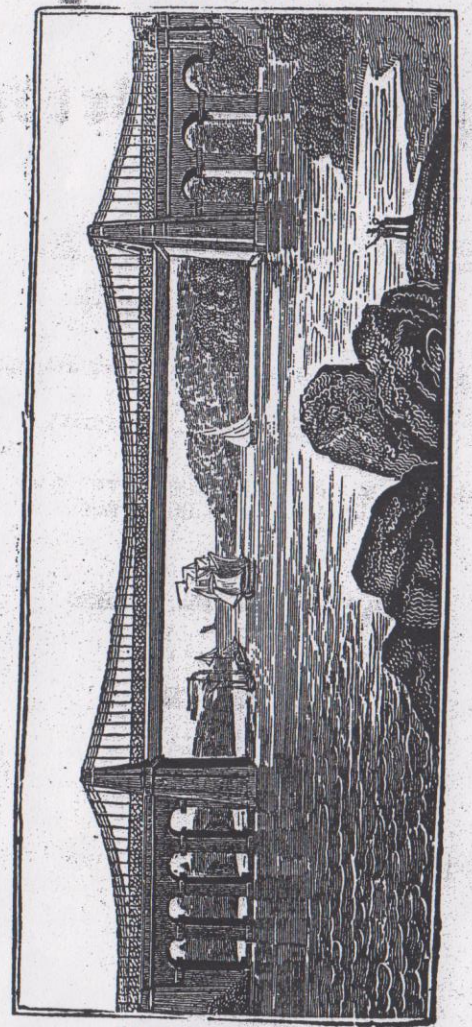
CARNARVONSHIRE.



MENAI SUSPENSION BRIDGE.

This view is taken from the Swilly Rocks.

ISLE OF ANGLESEY.

PARTICULARS

OF THE

GRAND

Suspension Bridge,

Erected over the

STRAITS OF MENAI,

BY ORDER OF GOVERNMENT;

Designed by, and Built under the immediate direction of

T. TELFORD, Esq. CIVIL ENGINEER.

Began in May, 1819, and Opened, for the use of the Public, on Monday, January 30th, 1826.

NARRATED BY DR. PRING.

Third Edition.

BANGOR:
Printed and Published by J. Brown, Book-binder.

1826.

Price Two Shillings.

[ENTERED AT STATIONERS' HALL.]

The humble Author of this Epitome, (wholly devoid of architectural talent) resided about a mile from the spot where the Menai Bridge is erected. Innate curiosity drew him frequently to the spot, to observe the growing "form and feature" of a Structure so novel, and which has left an indelible reminiscence on "the mind's eye."

He waited, anxiously expecting an abler *pen would undertake the task; he was disappointed, and now comes forward as the* timorous *Narrator, to record an Era, which will be considered, by future ages, as a prominent feature in the Annals of Wales.*

It must be universally allowed, that no one can give the world any adequate idea of the Design, Construction and Execution, of the Menai Suspension Bridge, in all its varied and complicated parts, except the renowned PROJECTOR *himself.*

Should such a Publication emanate from the erudite pen, and luminous mind of Mr. Telford; this puerile attempt must, necessarily, "hide its diminished head," and sink into the shade of oblivion.

Penrallt, near Bangor,
Feb. 22d, 1826.

PREFACE,
To the Second Edition.

The first Edition of this work, consisting of 600 *copies, having been disposed of in the short space of four months, and there being many eager enquiries at this time, for a Second Edition, the* AUTHOR, *flattered by such a signal proof of its public utility, is induced to re-print the work, with a detail of what has been done, since this magnificent Bridge was first Opened, on the* 30*th of January last.*

The Newspapers, soon after its opening, had reported: "that during stormy weather, the Bridge was impassable, *owing to its agitated state, from the effect of high winds;" than which, nothing could be more false, or malicious, as the public at large can testify—no carriage, horseman, or foot-passenger, having been detained a single instant, on any account, owing to its inefficiency, from its first opening, up to the present period.*

The outer iron-rails, on each side of the roads, were, at first, only slightly fastened, in a temporary way, with small chords; they have now, on their completion, been bound securely, and permanently, with three sets of strong mahogany rails, placed horizontally, made fast with iron screws.

The suspending Vertical Rods, which before were made tight to the road-planks, have since been eased; so that, even in case a hurricane should ensue, the action, or swinging of the Chains and Rods will not affect the stability of the platform, or suspended roadway, either laterally, or longitudinally.

PREFATORY OBSERVATIONS,

TO THE FIRST EDITION.

IT may possibly happen, that a person in perusing the Title of this Pamphlet, will erroneously conclude, without noticing its diminutive size, that it contains a Specification, with descriptive Plans, Sections, Elevations, etc. of the magnificent Bridge alluded to, displayed, as a guide to the aspirant; in this respect he will, however, find himself egregiously mistaken. He might just as well expect, by the aid *of this simple Narrative, to "build castles in the air;"*

> "Snap oaks, like twigs, across the knee,
> Quench Etna with a cup of tea;
> Sound, with a needleful of thread,
> The depth of ocean's briny bed."

The "Particulars" hereafter described are, in fact, neither more or less than a recapitulation of the PROGRESS *of the Work, as it appeared to an admiring observer, from its first Commencement—the nature and quality of the stone, the mode of taking over the Suspension Chains, etc.—to its Completion; interspersed with a few incidental occurrences.*

The road-ways, from the Toll-gates to the Arches, on the main piers, have been paved with Granite, brought purposely from Kingstown (Dunleary) in Ireland, and add greatly to the contour, and primitive beauty of the Bridge.

Ten elegant Lamps (manufactured in London) have also been added, formed of the best plate-glass, which have a most splendid effect by night.

The whole of the Iron-work has been re-touched with white paint, which gives it a lightsome, and elegant appearance.

It is calculated, that upwards of 70,000 *persons (many of whom have been conveyed by Steam Packets, from Dublin and Liverpool) have visited this stupendous National Work, during the last six months; and no doubt, its Novelty, and Grandeur, will continue to attract visitors, from all parts of the globe, for ages to come.*

Several additions will appear in the body of the work.

Penrallt, 14*th Aug.* 1826.

☞ *The* Second Edition *having been bought up in about a fortnight after its publication, a Third Edition is now presented to the Public.*

In the hurry and difficulty of preparing a statement of the Weight of the Iron, for the Second Edition, some inaccuracies crept in, which have been corrected in the Third Edition; *and the Weight of Iron, now laid down, may be considered nearly as correct, as the intricacy of the subject would admit.*

Penrallt, 4*th Sept.* 1826.

COMPLIMENTARY LINES,

Dedicated to Mr. Telford.

On viewing the Menai Suspension Bridge, and the grand Aqueduct, over the River Dee, as existing, and incontrovertible evidence, of his pre-eminent Genius.

THE following elegant Lines, from the pen of the celebrated Robert Southey, Esq. Poet Laureat, are inscribed to *Thomas Telford, Esq.* in allusion to his superior Talents, exemplified in the Construction and Erection of the superb Aqueduct, over the River Dee, called Pont Cyssylltir,* and the Grand Menai Suspension Bridge; both in North Wales.

TELFORD—who o'er the vale of Cambrian Dee,
Aloft in air, at giddy height upborne,
Carried his navigable road, and hung
High o'er Menai's Straits, the bending Bridge;
Structures, of more ambitious enterprise,
Than Minstrels, in the age of old romance,
To their own Merlin's magic lore ascribed.

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* From the British, of *Pont*—a Bridge, *cyssylltu*—to unite, *tir*—land.

WELSH PREDICTION,

Adverting to the Erection of a Bridge over the Straits of Menai.

THE following Traditionary Couplet, which has never before appeared in print, (though successively communicated, orally, from father to son) is currently said, and generally believed, by many persons now living, to have been uttered by the celebrated Seer, *Robin Ddu*, who lived about the close of the 16th century, and was remarkable for his "dark sayings." He resided in a small cottage, called, *Yr aelwyd isa' yn nghymru*—the lowest *hearth* in Wales—situate on the western boundary of the parish of Bangor, contiguous to the Straits of Menai; the foundation of the buildiug is still visible. The Distich is all follows:—

"Dwy flynedd, cyn aflonydd,
Pont ar Fenai fydd."

which, translated literally, runs thus:—Two years before tumult, there will be a bridge over the Menai.

The drift of this prediction seems, at present, inexplicable; but Time, that brings to light "the hidden things of this world," will, ere long, unfold "the mystery profound."

There are several other ominous Predictions by *Robin Ddu*, still extant, of "local forebodings," which are omitted here, as irrelevant to the present subject.

PARTICULARS.

OF THE

MENAI SUSPENSION BRIDGE.

First commencement of the Menai Suspension Bridge, on Ynys-y-moch, a natural Rock, situate about forty yards from the Anglesea, or north-shore, of the Menai Strait, near Bangor Ferry.

THE first process towards the Erection of this truly magnificent and unrivalled Bridge, took place in the month of May, 1819, by blasting, and removing the inequalities of the Rock, called Ynys-y-moch, (which at that time, was accessible only at low-water) to an even surface, in order to form thereon, a solid Foundation for the north Main Pier, on the Anglesea side.—For this purpose, in a few months afterwards, the inter-

mediate space, between the Anglesea shore and the Rock, was filled up with a temporary Causeway of stone-work, wide enough, on the summit, to admit of a rail-road, for sledges, drawn by horses, and which, being considerably elevated above high-water mark, afforded the workmen an opportunity of passing and repassing to their various occupations, at all times, without hindrance.

The tide being thus shut out from its usual passage, through this narrow strait, of course, increased the velocity of the current in the centre of the channel, which was afterwards, strikingly evident to those crossing in the Ferry-boats, during the ingress of the tide.

Previous, however, to the shutting up of the Navigation, (as authorised by an Act of Parliament) for the purpose of carrying the Suspension Chains over without interruption, by vessels passing through the Straits, this temporary Causeway was taken down, and the channel made considerably deeper, and wider than before, by which means, Coasting Vessels, of a moderate tonnage, were now, for the first time, enabled to pass through this narrow strait with perfect ease, safety, and facility, which before, was impracticable, the passage being then impeded by a sort of Embankment, raised about six feet above low-water mark, and formed of loose stones, over which Horned-cattle were drove, preparatory to swimming them across the main channel

of the river, from Ynys-y-moch to the Carnarvonshire side, when the tide was weak, and at its lowest ebb.

Many valuable head of cattle, have, at different times, been drowned, in attempting to swim across this dangerous passage, by being carried away, and irrevocably lost, by the irresistible impulse of the stream.

The impetus of the tide, in this part of the Strait, is at the rate of five miles per hour, independent of the influence of wind, which adds materially to its natural rapidity.

LAYING THE FIRST STONE OF THIS STUPENDOUS STRUCTURE.

THE temporary Causeway (before alluded to) being completed, and the superficies of the Rock (Ynys-y-moch) rendered even by the aid of masonry, the first stone of this wonderful work was laid (without the least appearance of pageantry, and, it may be added, with the utmost privacy) by Mr. W. A. Provis, the resident Engineer, on Tuesday, the 10th day of August, 1819, at 10 o'clock in the forenoon.

Late in the autumn of the same year, the preparation for the Foundation of the south Main Pier, on the Carnarvonshire side, was begun. After excavating the beach to the depth of seven feet, a solid mass of firm

rock was fortuitously met with, on which the present south Main Pier rests its "ponderous weight."

This Pier, from the extreme depth of its Foundation, exceeds, considerably, in quantum of masonry and workmanship, its gigantic rival on the opposite shore, the latter resting its base on Ynys-y-moch, the summit of which, in its natural state, is about six feet above high-water mark. This distinction is very evident at low water.

The most eligible view of the Bridge, in its present finished state, is from the sea-shore, just below the Laundry-house belonging to Gorphwysfa, a short distance, south-west of Bangor Ferry Inn.

OF THE SEVEN ARCHES WHICH SUPPORT THE ROAD-WAY, LEADING TO AND FROM THE BRIDGE.

THE four Arches on the Anglesea side, and the three on the Carnarvonshire side, which exceed in magnitude and grandeur, every work of the kind in Europe, were begun early in the spring of 1820, and completed late in the autumn of 1824.

Precise dimensions of these Arches will be given at the end of the book.

QUALITY OF THE STONE.

THE beautiful gray Marble (which takes a fine polish) of which the entire masonry of this superb work is built, was procured upon the sea-shore, at Penmon, on the north-east extremity of the Island of Anglesea, about seven miles from Beaumaris, on the property of Lord Viscount Warren Bulkeley; for which his Lordship was paid, by Government, sixpence per Ton.

The stone, which in its natural state is formed in layers, or shelves, and capable of being cut in solid blocks, of any given length or dimensions, was conveyed from the Quarries, along the sea coast, passing through the picturesque Bay of Beaumaris, to Bangor Ferry, a distance of about twelve miles, by small Coasting Vessels, employed for that particular purpose; three of which were, during tempestuous weather, unfortunately wrecked near Puffin Island, while endeavouring to pass through the Sound, where several Vessels, from distant parts, have met with a similar fate,

During the Erection of the Bridge, many, of the more industrious workmen employed their leisure hours, by polishing waste pieces of this beautiful, and frequently, variegated marble, and forming them into Letter-pressers, Ink-stands, and Chimney-ornaments, neatly executed, which have been eagerly purchaced by those who came

to visit this Grand Specimen of British Architecture.

OF THE TWO MAIN PIERS.

It is proper to observe, that the abutments of the two Main Piers are not formed of a solid bed of stone-work all the way up; on the contrary, eight hollow squares (four in each pier) were left, near the centre of the abutments, (commencing above high-water mark) and continued up, perpendicularly, nearly to the level of the road-way, which, as the pier advanced in altitude, were regularly worked within, and closely cemented with mortar, in the same manner as the external face of the pier. This method of forming wide abutments, adds greatly to the strength and solidity of the interior of the work, by binding the masonry more closely together; a self-evident position.

OF THE SUSPENSION PIERS, BEING A CONTINUATION OF THE MAIN PIERS.

After the completion of the seven Arches, (before-mentioned, page 12) the small Arches, intended for the road-ways, were constructed, each being 15 feet to the

spring of the Arch, and 9 feet in width, through which Carriages, &c. &c. are to pass.

After the Arches were turned, the Suspension Piers were further elevated, tapering gradually in a pyramidical form, to the height of 53 feet, from the level of the road, by solid masonry; each stone, from the bottom to the top of the Suspension Piers, being bound together with iron dowels, to prevent the possibility of being separated or bulged, by the immense pressure and weight of the Suspension Chains.

The stone-work being thus far completed, the next process was in the

IRON DEPARTMENT.

On the extreme height of the Suspension Piers, are placed the cast-iron Blocks, or Saddles, (with wrought-iron Rollers, and brass Bushes,) for the purpose of regulating the contraction and expansion of the Iron, by moving themselves either way, as may be required, according to the temperature of the atmosphere, without causing the least derangement in any part of the work. These self-acting Rollers are most ingeniously constructed, and form a desideratum in this line of Bridge-building.

OF THE IRON FRAMES, TO WHICH THE SUSPENSION CHAINS ARE FASTENED.

In order to form a permanent seat, grasp, or hold, for the Iron Frames, to which the lower, or extreme ends of the Suspension Chains were to be made fast, three oblique Cavities or Openings were made of a circular form, about six feet diameter, by blasting in a natural body of Rock, on the Anglesea side, leaving a considerable width of rock between each opening; which afterwards served as a passage for the Suspension Chains. These excavations were carried down, like an Inclined-plane, to the depth of 20 yards.

This being accomplished, a connecting avenue, chamber, or cavern was formed, horizontally, at the bottom of the Cavities, sufficiently capacious for the workmen to fix the Iron Frames, (composed, principally, of flat cast-iron plates) which were afterwards ingrafted (as it were) by initiation, in the natural rock, so as to bid defiance to any stress that might bear upon them; and immoveable, until the whole mass of solid rock itself gives way. This Cavern can now be entered from a passage bored purposely, through the same rock, below the level of the road-way.

A similar mode of proceeding was adopted on the Carnarvonshire side, but, as the rock was situated at a greater distance from the bed of the river, than that on the Anglesea side, and having also to cut through a considerable bank of earth, it turned out an undertaking of immense labour, and took up a considerable time to accomplish. This accounts for the disproportion apparent in the catenary, or chord-line of the Suspension Chains.

The Iron Frames being thus permanently fixed and adjusted, the next operation was

FIXING THE SUSPENSION CHAINS, MADE EXCLUSIVELY OF WROUGHT-IRON.

The Suspension Chains being firmly secured, and made fast to the Iron Frames (before treated of) the chain bars, each ten feet in length, were then laid down, by placing five together, (equivalent to one breadth of chain) and carried on, by consecutive lengths, joined by flat iron-plates and bolts, to the apex of the Suspension Piers, supported, underneath, all the way up, by a frame-work of strong timber; the upper end of the Chain, resting on the cast-iron Saddles, which had been placed there to receive them.—*(Vide page 15.)*

The reader will bear in mind; that at this period, the Suspension Chains were carried no further, from their fastenings in the rock on each side, than the top of the Suspension Piers, leaving the Chain disjunct, with an open space intervening between the two Suspending Piers, for the curved part of the Chain; which, in reality is *the actual Line of Suspension*, on which hangs the whole weight of the road-way, or any additional weight added thereto, by loaded waggons, heavy droves of cattle, or any other excessive weight passing over it.

It now becomes necessary to explain, how the open space between the two opposite ends of the Chain was filled up, and the (at present disjunct) ends of the Chains, were made continuous to each other, so as to form a complete Chain.

But first, it must be premised, that the part of the Chain on the Carnarvonshire side, was afterwards lengthened, by adding additional chain-bars, from the apex of the Suspending Pier until it reached down, perpendicularly, nearly to high-water mark; whereas, the part of the Chain on the Anglesea side, extended no further than the apex of the Suspension Pier.

PROCESS USED
IN
Taking over the first Suspension Chain,
Of which the remaining 15 were a mere repetition.

On Tuesday the 26th of April, 1825, the first Chain (*i. e.* the curved part thereof) of this stupendous work, was thrown over the Straits of Menai; the day was calm, and highly propitious for the purpose.

An immense concourse of persons, of all ranks, began to assemble on the Anglesea and Carnarvonshire shores, about twelve o'clock at noon, to witness a scene, which our Ancestors had never contemplated.

Mr. Telford attended, to see this part of his Grand Scheme effected.

Among the spectators were—

Sir Robert Williams, Lady Williams, & family; Lord and Lady Boston, and family; Colonel Peacoke; Major Hampton, and family; John Williams, Esq. and family, Trosyrafon; Wm. Wynne Sparrow, Esq. and family, Red Hill; John Price, Esq. Plas Cadnant; Hugh Evans, Esq. and family, Henblas; Rev. H. Rowlands, Plasgwyn; Rev. R. Williams; Rev. P. B. Williams; Rev. J. Hamer; Rev. Ellis Roberts; Rev. Hugh Price; Rev. E. Jones; Thomas Jones, Esq. and family, Cromlech; Samuel Worthington, Esq. and family, &c. &c.

Numerous pleasure-boats, arrayed in all their gaudy colours, were seen "gliding, in envious pride, on Menai's proud waters."

Precisely at half-past two o'clock, it being then about half-flood tide, the Raft,* prepared for the occasion, stationed on the Carnarvonshire side, near Treborth Mill, which supported the part of the Chain intended to be drawn over, began to move gradually from its moorings, towed by four boats, with the assistance of the tide, to the centre of the river, between the two Grand Piers; when the Raft was properly adjusted, and brought to its ultimate situation, it was made fast to several buoys, anchored in the Channel for that specific purpose. The whole of this arduous process was accomplished in twenty-five minutes.

The part of the Chain, pending from the apex of the Suspension Pier, on the Carnarvonshire side, down nearly to high-water mark, was then made fast by a bolt, to the part of the Chain lying on the Raft; which operation was completed in ten minutes.

The next process was fastening the other extremity of the Chain, still lying on the Raft, to two blocks, of immense size and power, for the purpose of hoisting it up to its intended station, the apex of the Suspension Pier, on the Anglesea side; the tension of the Chain, at this time, was forty tons.

*450 feet long, and 6 feet wide.

When the blocks were made secure to the Chain, (comprising twenty-five ton weight of iron) two Capstans, and also two preventive Capstans, commenced working, each Capstan being propelled by thirty-two men.

To preserve an equal force and tension in the rotatary evolutions of the two principal Capstans, two fifers played several enlivening tunes, to keep the workmen regular in their steps; for which purpose they had been previously trained.

At this critical and interesting juncture, the attention of every one present, seemed rivetted to the novel spectacle, now presented to their anxious view; the Chain rose majestically, and the gratifying sight was enthusiastically enjoyed by all present, in "breathless silence."

At ten minutes before five o'clock, the final bolt was fixed, which completed the whole line of Chain, and the auspicious event was hailed by the heartly acclamations of the numerous spectators, joined by the vociferations of the workmen, which had a most delightful effect, from the reiteration of sound, caused by the reverberation of the rocks, on the opposite banks of the river.

Not the least accident, delay, or failure, occurred in any department, during the whole operation; which does infinite credit to every individual engaged in this Grand Work.

From the casting off of the Raft to the uniting of the Chain, took up only two hours and twenty minutes, which appears truly astonishing, when the magnitude of the work is considered, and which could be appreciated by those only who had an opportunity of viewing it—a work, differing, in sublimity of design, from every other Bridge; and which, undeniably, has not its equal in the known world.

Upon the completion of the Chain, three of the workmen, viz. Hugh Davies, stone-mason, William Williams, labourer, and John Williams, carpenter, had the temerity to pass along the upper surface of the Chain, which forms a curvature of 590 feet. The versid sine of the arch is 43 feet.

On the termination of the day's proceedings, each workman (about 150 in number) was regaled, by order of the Right Hon. the Parliamentary Commissioners of the Holyhead Road Improvements, with a quart of *Cwrw da.*

Thus concluded a day, which linked the reciprocal Interests of the Counties of Anglesea and Carnarvon in a UNION, which, "it is devoutly to be wished," will never be broken.

The ancient British name of Anglesea, is "MÔN—MAM CYMRU,"—the Mother of Wales; who will, by this uninterrupted communication, be more closely connected with her children, than heretofore.

The other 15 Chains were taken over according to the following dates:—

2nd Chain.....28th April.

[On the 6th May, William Williams, labourer, after finishing his day's work, sat himself down quietly on the centre of the curved part of the upper Suspension Chain, with his feet resting on the one below it, and, in that position, actually went through the regular operation of making a pair of small Shoes, in the short space of two hours; which he afterwards sold for a Sovereign. He was led to suppose, that the Shoes were purchased for Public Exhibition, at the British Museum!]

3rd Chain.....	May 7th.
4th do.....	— 10th.
5th do.....	— 13th.
6th do.....	— 14th.
7th do.....	— 21st.
8th do.....	— 24th.
9th do.....	June 4th.
10th do.....	— 8th.
11th do.....	— 10th.
12th do.....	— 11th.
13th do.....	— 15th.
14th do.....	— 21st.
15th do.....	— 28th.

TAKING OVER THE LAST, OR 16TH CHAIN.

ON Saturday, the 9th July, 1825, the last Suspension Chain of this truly marvellous, and sublime work, was taken over, which completed the entire Line of Suspension.

The anxiety felt by many to witness a spectacle so novel and interesting, had drawn together numerous persons, of all ranks, from every part of the United Kingdom, in addition to those resident within thirty miles of the spot.

The weather was particularly fine—the sun shone forth in all its wonted splendor—the shores were covered with innumerable spectators—and the river was elegantly studded with pleasure-boats, adorned with flags "of every hue."

Smooth, as a mirror, was the deep,
Save zephyr, all the winds asleep.

The same mechanical process was pursued, in taking the Chain over, as that stated in a former account, *(vide page* 19*)* only with this difference; the workmen having acquired, by practice, an increased degree of adroitness, this (the last) Chain was got over, and the bolt fixed, in one hour and thirty minutes; being a saving (in time) of fifty minutes, compared with the First Chain, which took up two hours and twenty minutes.—*(Vide page* 22.*)*

On fixing the final bolt, a Band of Music descended from the top of the Suspension Pier, on the Anglesea side, to a scaffolding, erected for that purpose, on the centre of the curved part of the Chains, (which form an inverted rainbow) and there played the National Air of "*God save the King,*" amid the cheering and exultation of the numerous spectators, on the opposite shores; "and loud and many were the acclamations of the admiring multitude."

The workmen were then arranged, and marched (accompained by music) in Indian file, on a platform, resting on the two lowest centre Chains, from the Anglesea to the Carnarvonshire side, along the curvature of the Chain, and back again; which had a most picturesque effect from the sea-shore, the altitude diminishing the natural size of the objects, and giving them the imaginary appearance of "aerial beings."

While this interesting scene was going forward, the St. David Steam Packet, of Chester, D. Sarsfield, R.N. Commander, passed under the Chains, to a short distance beyond the Bridge towards the Swilly rocks, then put about, and returned back again, to its former station in the River, a little below Gorphwysfa wood.

This Steam Packet had the distinguished honor of Opening the Navigation of the Strait, which had been closed, after giving due public notice, from the 21st of April preceeding.

OF THE VERTICAL RODS.

THE sixteen Suspension Chains being all adjusted, and placed equi-distant to each other, the Vertical Rods were fastened to them, the lower ends being firmly bolted to the iron Sleepers, (or transverse road-way bars) each Vertical Rod and Sleeper being placed, longitudinally, five feet apart. There are one hundred and eleven Sleepers, to each of which are attached, transversely, four Vertical Rods, making the whole number of Vertical Rods in the Line of Suspension, (*i. e.* between the two Suspension Piers) four hundred and forty-four.

OF THE SUSPENDED ROAD, FORMED OF DEAL PLANKS.

THE next process was laying the planks down, across the Sleepers, to form the Suspended Road-way—the main spring of the whole project—the *ne plus ultra* of the grand scheme—on which hung the entire fate of the whole enterprise.

Saturday, 24th Sept. 1825, at five o'clock, *p. m.* the first trier of planks on the road-ways were rendered passable for the convenience of the workmen; on which

occasion, after mounting a Flag, to announce the happy event, a Royal Salute, of 21 guns, was fired at Craig-y-don, the hospitable Seat of O. Williams, Esq. M. P. (one of the Commissioners) situate about a mile, north-east of the Bridge, His eldest son, T. P. Williams, Esq. M. P. gave £4. to be distributed among the workmen.

The road-way consists of two Carriage-roads, each twelve feet in breadth, with a foot-path, of four feet in breadth, in the centre between them, inclosed all the way by an iron railing, on each side, to secure Passengers from any accident, which might otherwise occur, in case of horses proving restive; and it also affords personal protection from carriages, or horned cattle, passing along the road-way.

Three tier of deal planks form the flooring of the road-way. The lowest tier of planks are three inches thick; the second tier, two inches thick; both laid down longitudinally, as the road runs. The third, or upper tier, two inches thick, are laid transversely, to the width of eight feet, with side-guides, made of African Oak, to keep the carriage wheels clear, from injuring the Vertical Rods.

The form of the Suspended Road-way is somewhat convex, rising gradually from the ends to three feet high at the centre, which gives it a most graceful appearance, when viewed in front; it resembles a kind of eye-brow curve.

Here it is proper to make a momentary digression, to state: that while the Ferry-boats formed the only communication, between Anglesea and Carnarvonshire, at Bangor Ferry, three-quarters of an hour was usually consumed in the irksome process of unloading the coach; shipping the passengers, luggage, and parcels, into an open ferry-boat; crossing the channel, and then unshipping again; and, lastly, reloading a second coach, to take on the Passengers, &c.

But independent of the inconvenience, inturruption, and loss of time, few persons, except those who have undergone the ordeal, are aware of the unpleasant sensation experienced by Inside-passengers, on their arrival at Bangor Ferry, being forced to quit a warm birth, whether by day, or in the dreary dead of the night, and unavoidably exposed to (frequently) a tremendous heavy rolling sea, with terrific waves washing into the boat, and tossing it about, fore and aft, so as to alarm even the bold and daring spirit of an experienced seaman; or, perchance, forced to endure the unpleasant effect of a drenching shower of rain—"the pelting of the pitiless storm,"—with other vicissitudes of inclement weather; or, which was a circumstance of very common occurrence, the probability of *a wet jacket*, either from rain or sea-water, for the remainder of the journey.

Such annoyances, miseries, and perplexities, as those just described, speak volumes; and has, for ages past,

shewn the actual necessity of doing away with such a public nuisance.

An antidote has, at last, by the ingenuity of Mr. Telford's enlightened mind, been fortunately discovered, and now brought into action, which will prove an irrefragable elucidation of the decided convenience, safety, and gain in time, effected by the erection of this (to say the least of it) USEFUL Bridge.

The Ferry was the private Property of the Plas Isa' family, of Conway, who have held it for time immemorial, although they possessed no written document to shew, how the family first became possessed of it. Soon after the building of the Bridge had commenced, a certain sum was offered, on the part of Government, to the Guardians of Miss Williams, the heiress, who was at that time under age, but which was not thought, by them, equivalent to its real value. Government had, therefore, no alternative left but to bring the question before a regular Jury. Accordingly, at the Spring Assizes, held at Beaumaris, March 4th, 1820, the question for an equitable Compensation for the value of the Ferry, was argued by Counsel, before Judge Leycester, and a Special Jury; when the latter, after taking an average of the annual returns, for the 13 years preceeding, amounting to £885. 18s. 0d. per annum, awarded, allowing at the rate of thirty year's purchase, the sum of £26,577. Which sum was paid by Govern-

ment to Sir D. Erskine, in right of his Lady, (formerly Miss Williams, of Plas Isa',) on the day the Menai Bridge was opened.

On the night previous to Opening the Bridge, a Notice was sent to the Ferryman, that as soon as the Mail Coach had passed over the Bridge, the Ferry-boats were to cease plying, and the Ferrymen's services were from that moment, no longer required—an event, that deserves to be recorded in *letters of gold.*

FINAL OPENING of the BRIDGE

For the Accommodation of the Public.

On Monday, the 30th Jan. 1826, this stupendous, pre-eminent, and singularly unique structure, was opened to the Public, at 35 minutes after one o'clock, *a. m.* by the Royal London and Holyhead Mail Coach, conveying the London Mail-bag for Dublin; David Davies, Coachman, William Read, Guard.

Mr. W. A. Provis, the resident Engineer, had received Instructions from the Commissioners, to meet the

London down Mail, at Bangor Ferry Inn, and there take charge of it across the Bridge. As soon as the horses were changed, he got upon the Mail Coach, accompained by Mr. Akers, Mail Coach Superintendant; Mr. Hazledine, the Contractor for the iron-work; Mr. J. Provis, the superintendant for proving and examining it; Mr. Rhodes, the director of the iron and timber work; Messrs. J. and W. Wilson, sons of the contractor, for the masonry; and as many more as could find room to sit or stand, or even procure a place to hang by.

Thus loaded, the Mail Coach proceeded on, about a quarter of a mile, to the Toll-gate, which, was immediately thrown open, and, amidst the glare of lamps, (a heavy gale of wind blowing at the time) it passed across the Bridge in grand style;

> The high-mettled steeds, mantling their proud crescent necks,
> As if conscious of the triumphant achievement.

The first private Carriage that crossed, was that of Augustus Elliott Fuller, Esq. one of the Commissioners, drawn by four beautiful greys.

The second private Carriage, was Mr. Telford's, in which sat Sir Henry Parnell, Bart. and himself.

The first Stage Coach was the Pilot, Bangor and Carnarvon Day-coach.

The first London Stage Coach, was the Oxonian.

After these, the Carriage of Sir D. Erskine. Bart.

Here it is proper to make a momentary digression, to state: that while the Ferry-boats formed the only communication, between Anglesea and Carnarvonshire, at Bangor Ferry, three-quarters of an hour was usually consumed in the irksome process of unloading the coach; shipping the passengers, luggage, and parcels, into an open ferry-boat; crossing the channel, and then unshipping again; and, lastly, reloading a second coach, to take on the Passengers, &c.

But independent of the inconvenience, inturruption, and loss of time, few persons, except those who have undergone the ordeal, are aware of the unpleasant sensation experienced by Inside-passengers, on their arrival at Bangor Ferry, being forced to quit a warm birth, whether by day, or in the dreary dead of the night, and unavoidably exposed to (frequently) a tremendous heavy rolling sea, with terrific waves washing into the boat, and tossing it about, fore and aft, so as to alarm even the bold and daring spirit of an experienced seaman; or, perchance, forced to endure the unpleasant effect of a drenching shower of rain—"the pelting of the pitiless storm,"—with other vicissitudes of inclement weather; or, which was a circumstance of very common occurrence, the probability of *a wet jacket*, either from rain or sea-water, for the remainder of the journey.

Such annoyances, miseries, and perplexities, as those just described, speak volumes; and has, for ages past,

shewn the actual necessity of doing away with such a public nuisance.

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late Proprietor of the Ferry, drawn by four elegant greys, decorated with ribbons, followed by numerous Gentlemen's carriages, landaus, gigs, cars, poney-sociables, &c. &c. upwards of one hundred and thirty in number; and horsemen innumerable.

By the particular and modest request of Mr. Telford, the Architect, a regular and splendid Procession, as at first intended, was dispensed with, to the serious disappointment of at least five thousand persons, who had assembled on this memorable occasion.

The cloud of disappointment, however, soon dissipated, and the numerous pedestrians—among whom were several persons of the first distinction, from both counties—continued parading along the beautiful platform Road-way, for several hours. Joy, admiration, and astonishment, seemed depicted in every countenance, on beholding the proportion, symmetry, and grandeur, apparent to the most common observer, in every part of this unrivalled structure.

During the morning, the rain fell in torrents, but towards mid-day, the weather cleared up, and the afternoon was fine. The wind, due south, blew fresh throughout the day, which caused a trifling, though scarcely perceptible, undulatory motion, about the centre of the Bridge. Horses, of every description, nevertheless, passed over, without evincing the least shyness or timidity.

A Royal Standard was hoisted on each of the Main Piers, together with numerous other flags; one displayed the loyal motto of "*Long live the King.*"—Cannons were stationed on each side of the Bridge, which continued firing, at intervals, the whole day. A Band of Music attended, for the entertainment of the company, changing its situation, occassionally, from one side of the Bridge to the other.

When we reflect on the varied appearance of the numerous persons and objects present—the elegance of the equipages—the bold and sublime scenery of the country adjacent—and though last, not least—the General Public Utility of this Grand National Work; it must be allowed, that the *coup de œil* was most enchanting; it was, indeed, a proud day for Cambria.

Wednesday, 1st of Feb. 1826, the first three-masted vessel that passed under the Bridge, was the Ship Melantho, of Carnarvon, homeward bound from Liverpool, with all her spars up, and sails set, commanded by Captain Lloyd; piloted by David Hughes, of Bangor. The Melantho had been stranded, a few months previously, at Llanddwyn, on the western extremity of the Menai Strait; but was afterwards purchased, repaired, and refitted at Carnarvon. Her top-masts were nearly as high as those of a Frigate, and yet cleared 12 feet and a half below the centre of the Road-way, as ascer-

tained by Mr. Rhodes, the Iron-master, by measurement.

An inconceivable number of Foriegners, of the highest distinction and celebrity, came at various times, to view, examine, and witness the progress of this wonderful Bridge—which seems to have excited the surprise and attention of the most scientific men, in every quarter of the globe.

CASUALTIES.

It could scarcely be expected, in a work of such magnitude and intricacy, that every species of casualty could possibly be prevented. Few, indeed, of the many hands employed, were maimed; but it is a melancholy duty to state, that during the erection of the Bridge, four workmen lost their valuable lives, in the execution of their various employments, viz. John Read, stone-mason, a Scotchman: David Roberts, stone-mason, and Robert Roberts, carpenter, Welshmen; and John Key, stone-mason, an Englishman.—In each instance, it is to be regretted, owing to the want of common prudence on their own part; as every precaution was taken by the Overlookers of the work, to prevent, as far as possible, any fatal occurrence.

Thus, by a singular coincidence, each distinct branch of Great Britain has contributed its quota, in the fatal list of casualties.

CONCLUSION.

This National, and splendid specimen of British Architecture, will be a lasting monument to the discernment of the present Government, for having called into requisition, the transcendent talents of Mr. Telford, who has thus, by a positive proof of superior scientific knowledge and taste, signalized himself, in this line—The First Architect of the Age.

The skilful manner in which the various concomitant parts of this magnificent Bridge has been executed, will remain an indelible proof of the superior abilities of Mr. W. A. Provis, Resident Engineer; Mr. J. Provis, prover and examiner of the Iron; Mr. J. Wilson, the Contractor for the Masonry; Mr. Hazledine, the Iron-founder; and Mr. T. Rhodes, the superintendant Engineer for the Iron and Timber work.

In the former part of this Pamphlet it was shewn, that it had been foretold, upwards of a century back, by *Robin Ddu*, that a Bridge would be built over the River Menai.

A person who has lately seen, and minutely examined this MASTER-PIECE OF PERFECTION, has predicted: That the Menai Bridge will rank, in future ages, as the Eighth Wonder of the World.

Ere Snowdon sinks down, or its cliffs rift asunder,
Menai Bridge will be rank'd, as The World's Eighth Wonder.

DIMENSIONS
OF THE STONE-WORK.

THE height of each Main Pier, is one hundred feet, from high-water line, to the level of the road-way.—From thence, to the apex of the Suspending Pier, 53 feet. The arches, through which carriages, &c. pass, are nine feet wide, and fifteen feet to the spring of the arches, where the Lamps are placed. From the Main Piers to the Toll-houses, the road falls at the rate of one foot in twenty-five. Each of the small Piers, from high-water line, to the spring of the arch, is sixty-five feet; the span of each arch is fifty-two feet, six inches. The road on the Bridge consists of two carriage-ways, twelve feet each, with a foot-path, of four feet, in the centre. The length of the suspended part of the platform, or road, is five hundred and fifty feet.

The Toll-house, on the Carnarvonshire side, is considered, in design and execution, a masterly performance; and does equal credit to the Architect, and Builder.—Mr. Telford, and Mr. Wilson.

The Toll-house, on the Anglesea side, is perfectly unique; and is remarkable for its elegant solid stone-roof.

DIMENSIONS
OF THE IRON-WORK.

THE Chains, sixteen in number, consist of five chain-bars in each length. Each chain-bar is (generally) 10 feet long, 3¼ inches wide, and 1 inch thick; with 6 chain-plates at each end, 16 inches long, by 8 inches broad, and 1 inch thick; secured by two bolts, at each joint, each bolt weighing 56lbs. The total number of chain-bars, in the cross section of the chain, is 80. The number of chain-bars (consisting of five bars to each length) in one chain, is 935; in the sixteen chains, 14,960. The entire length of the chain, from the fastenings in the rocks, is 1678 feet. The number of chain-plates (which unite the chain-bars) in each chain, is 122; in all 17,952. The number of bolts, in each chain, is 374; in all 5,984. The vertical rods, an inch square, (suspended from the chains) are placed 5 feet apart, and support the sleepers, (or road-way bars) which form the flooring of the road-way. The number of suspension rods, in each line, is 199; total in the four lines, 796. The number of sleepers, is 111. The number of truss'd-rods, and king-posts, which (with the sleepers) support the suspended part of the road, is, of each, 222; in all 444.

WEIGHT OF THE IRON.

	lbs. weight.
64 large chain-bars, 7½ feet long, 4 inches wide, and 1½ inch thick, each bar weighing 150lbs. multiplied by 5, makes	48,000
384 large chain-plates, 18 inches long, 10 inches broad, and 1½ inch thick, each weighing 75lbs.	28,800
128 large bolts, each weighing 126lbs	16,128
123 chain-bars, 10 feet long, 3¼ inches wide, and inch thick, each weighing 124lbs. multiplied by 5, makes	76,260
738 chain-plates, 16 inches long, 8 inches broad, and 1 inch thick, each weighing 32lbs	23,616
246 bolts, each weighing 56lbs	13,776
597 connecting rods and bolts, each weighing 27lbs.	16,119
16 steadying-ties, each weighing 1225lbs	19,600
Total weight of one chain (making 121 tons, 299lbs)	242,299
2 cast-iron plates, under the saddles, each weighing 46,080lbs	92,160
8 saddles, each weighing 3,248lbs	25,984
20 tie-bars, for the saddles, 20 feet long, by 3 inches square, each weighing 600lbs	12,000
64 rollers. each weighing 335lbs	21,440
16 guide-plates and brass bushes, each weighing 373lbs	5,968
199 suspension-rods, averaging 33½ feet in length, by 1 inch square, each rod weighing 111lbs. multiplied by 4, makes	88,356
111 sleepers, each weighing 334lbs	37,074
222 trussed-rods, each weighing 40lbs	8,880
222 king-posts, each weighing 7lbs	1,554
Anglesea side. 98 side-rails, each weighing 80lbs.	7,840
Anglesea side. 98 foot-way rails, each weighing 50lbs	4,900
Suspended part. 222 side-rails, each weighing 65lbs	14,430
Carnarvonshire side. 74 side-rails, each weighing 80lbs	5,920
Carnarvonshire side. 74 foot-way rails, each weighing 50lbs	3,700
	330,206

Brought over	330,206
6 cast-iron frames, for the fastenings in the rocks, each weighing 2,240lbs	13,440
24 round bolts, 9 feet, by 6 inches, each weighing 444lbs	10,656
Anglesea side. 78 side road-rails, each weighing 80lbs	6,240
Anglesea side. 24 centre road-rails, each weighing 50lbs	1,200
Anglesea side. 78 cast-iron stanchions, to support the rails, each weighing 176lbs.	13,728
Anglesea side. 24 short stanchions, each weighing 100lbs	2,400
Anglesea side. 39 hand-rails, each weighing 104lbs	4,056
Carnarvonshire side. 38 side road-rails, each weighing 80lbs	3,040
Carnarvonshire side. 40 cast-iron stanchions, each weighing 176lbs	7,040
Carnarvonshire side. 38 hand-rails, each weighing 104lbs	3,952
484 cast-iron parapet rails, each weighing 31lbs	15,004
4 sets of cast-iron saddles (near the Anglesea Toll-gate) each weighing 2,016lbs	8,064
8 gate-posts, each weighing 533lbs	4,264
4 toll-gates, each weighing 325lbs	1,300
2 lamp-posts, each weighing 300lbs	600
12 tie-bars, in the pier arches, each weighing 533lb	6,396
32 cast-iron saddles, (above the Toll-house, on the Carnarvonshire side) each weighing 416lbs	13,312
4 plates, under the (last-mentioned) saddles, each weighing 900lbs	3,600
	448,498
Total weight of the sixteen chains (1938 tons, 784lbs)	3876,784
Total weight of Iron	4325,282

Making, in all, 2162 tons, 1282lbs.

N. B. The above calculations are made from Mr. Samuel Penn's Tables, of the Weight of Iron.

TOLLS

TAKEN AT THE MENAI BRIDGE.

	s.	d.
For every Stage Coach, and Mail Coach.....	2	6
For every Post Chaise, Coach, Landau, Berlin, Barouche, or other such Carriage, with 4 wheels and 2 horses...	3	0
Ditto ditto, with 4 wheels and 2 horses.....	2	0
For every Waggon, Wain, or other such Carriage, with 4 wheels.....	1	0
For every Cart, or other Carriage, with two wheels.....	0	6
For every Horse, Mule, or Ass, not drawing any Carriage.....	0	2
For every Foot Passenger.....	0	1
For every drove of Oxen, Cows, or neat Cattle, per score,	1	0
For every drove of Hogs, Calves, Sheep or Lambs, per score.....	0	6

N. B. A Ticket will clear both Gates for the remainder of the day.

Finis.

Bangor: printed by J. Brown.