

by marriage with the Houses of Austria, Prussia, and the Orleans family of France.

What has given them this position? Is it mere accident, or do they possess any intrinsic qualities by which they have earned it? This question is not very difficult to answer. In the first place, they have the advantage of good personal appearance. Nature has endowed them, we will not say with beauty, but with handsome and pleasing persons. It is only the shallow philosopher that will laugh at this, and suppose it can have nought to do with success in Europe. Not so; it materially assists in winning the esteem of mankind, and on the esteem of our fellows all political prosperity rests.

But we must look farther: personal appearance *alone* will not command position and influence. If we cast the eye over the career of the family, we shall observe that they have been generally successful in the exercise of their parental duties. All parents know how difficult these duties are to fulfil; and in high stations, where temptations are abundant, the difficulties must be greater. Yet the Coburgs have succeeded in training their young so as to make of them worthy men and worthy women, fitted for the business of life. This redounds greatly to their credit, and has materially strengthened the position of the family.

But a third quality of the Coburgs is no less conspicuous; and that is, their strong common sense. They have not earned military distinction, they have not made scientific discoveries; neither literature nor art make any of them their slaves; they cannot be said to have exhibited brilliant genius in any department; and yet, in the business of their lives, they show a prudence and discretion which have been the prime causes of their success. Witness the able manner with which Leopold has acted the part of constitutional monarch in Belgium, reminding us of our William III, who had a similar, and hardly more difficult position, a century and a half ago. Witness the excellent sense displayed by our sovereign in her sometimes rather delicate dealings with the chiefs of political parties. Witness the sound judgment which has shown itself in the addresses of the Prince Consort, as philanthropist and as patron of science and art. Witness, too, the tranquil state of Portugal, over which Coburg influence has presided for more than twenty years. It is clear, then, that as a family they possess strong common sense—a common sense that enables them to appreciate and adapt themselves to the circumstances by which they are surrounded; still more, a common sense that enables them to do, what Louis Napoleon boasts of—to understand the character of the age. And perhaps they understand it better than his Imperial Highness. *He* has cast in his lot with universal suffrage and despotism; *they* with constitutional monarchy and representative institutions. *It remains to be seen which is the correct reading.*

The events that followed 1848 were a serious blow to the liberal cause; and one ill effect has been that the Coburgs, as if losing faith in their principles, have begun to ally themselves with absolute courts, such as Austria. The temptation is great; but to proceed far in this direction will be fatal to

the popularity, and sooner or later to the influence, of the family. They will cease to represent the liberal cause; they will no longer be allied with the principle of progress, which, however much it be retarded and thrown back, must eventually crush all resistance in its sure but gradual advance. Herein consists the danger to the House of Coburg, and it is a danger incident to all who sit long upon a throne. It is that of forgetting the people by whom the throne is supported, and for whose welfare it exists. So far, the House of Coburg has not fallen into this grave and irredeemable fault. So far, they have lent themselves to the service of mankind, and are reaping the fruit in the approbation and esteem of the civilized world. So far, they are identified with liberal policy. So far, they represent that large and moderate class of society, who struggle to preserve the blessings of freedom without its excesses, and save mankind without subjecting it to military dictatorship. Therefore it is that the family of Saxe Coburg are prospering; for these reasons they hold the prominent place they do in the councils of Europe; and whatever the future may have in store for them, they are for ever associated with our century, and history will make honourable mention of their names.

RAILWAY BRIDGES AND VIADUCTS.

The number of bridges in the country has been enormously multiplied by the railways. The South Eastern line has not less than 141; the South Western, 188; and the London and Birmingham, 270. It was ascertained in 1847, that, for every mile of railway constructed up to that time, from two to four bridges had been built, many of them hundreds of feet in length, of great height, solidity, and cost. The vast majority are, however, of the smaller class, leading the lines over canals, over or under the common roads and narrow field communications. They were at first wholly of brick or stone, according to the district; but it was soon found more economical to erect them by means of cast-iron girders, laid from one abutment to the other. It is frequently the case that railways intersect existing communications at an oblique angle, in which case, to preserve the straightness of the line, the arch of the bridge is placed obliquely to the abutments. These ingenious structures are styled "skew bridges," of which there are many beautiful examples in brick, stone, and ironwork.

Improvements in the manufacture of iron, together with increased facilities of transit, led to its use and extensive employment in building bridges. The first in the kingdom was constructed over the Severn, at Colebrook Dale, about the year 1780. It consists of five cast-iron arched ribs, nearly semicircular, with uprights of the same material, upon which the roadway is carried. Another example, on a different plan of construction, was soon afterwards carried over the river Weir at Sunderland—a single arch, bold and elegant, remarkable for its span of 200 feet, which it was then thought could not be surpassed. Vauxhall Bridge, London, is said to be the lightest of its kind in Europe; but

the one at Southwark is the largest and finest iron-arched erection in existence. It crosses the Thames with three arches, the central one being 240 feet in span, and the two side ones 210 feet.

The use of iron admitted of the construction of bridges upon the suspension principle, which com-



BRIDGE OVER THE THAMES AT MAIDENHEAD.*

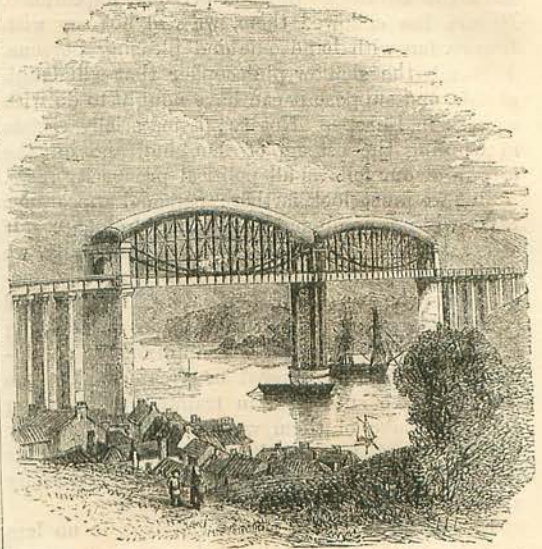
bine lightness, elegance, and cheapness; can be built expeditiously, and be stretched across channels in which it is impossible, from the rapidity of the current, the altitude of the banks, and other obstacles, to erect piers for an arched bridge. The principle is as old as the spider's web, and has long been practically applied by rude tribes. They form ropes of rushes, or leathern thongs; stretch as many of them as are necessary between trees or posts on opposite banks; connect and cover them so as to make a slight pathway; and thus pass over the chasms of the Andean and Himalayan mountains. About a century ago, a bridge of iron wire was suspended over the Tees, near Durham, which served for foot passengers; another, in 1816, was hung over Gala Water at Galashiels, to establish communication between different parts of a manufactory; and a third was stretched across the Tweed at King's Meadows. But it was generally supposed that such structures were not applicable to the active and heavy traffic of a commercial country; and notwithstanding Telford's splendid achievement at the *Menai Strait*, probably no suspension bridge could be constructed to bear permanently the load that is hourly passing every day over London Bridge.

The *Menai Strait* has since been spanned by a bolder and more novel highway—the *Britannia*

* This is said to be the boldest bridge ever constructed; the actual pressure at the crown of the arch being about one-third of that which would begin to injure the cohesive strength of the material of which it is composed. In ordinary bridge building, one-twentieth of such pressure is considered advisable for safety. The bridge crosses the Thames, and under it may be indistinctly seen the celebrated *Bray church*. Brunel was the engineer. The two large arches are each 128 feet wide, and only rise twenty-four feet three inches. The bridge is of brick.

Tubular Bridge—one of the most wonderful achievements in the annals of scientific and mechanical enterprise.

A tubular bridge, upon the suspension principle, in some points more extraordinary than the *Britannia Bridge*, has since been thrown across the

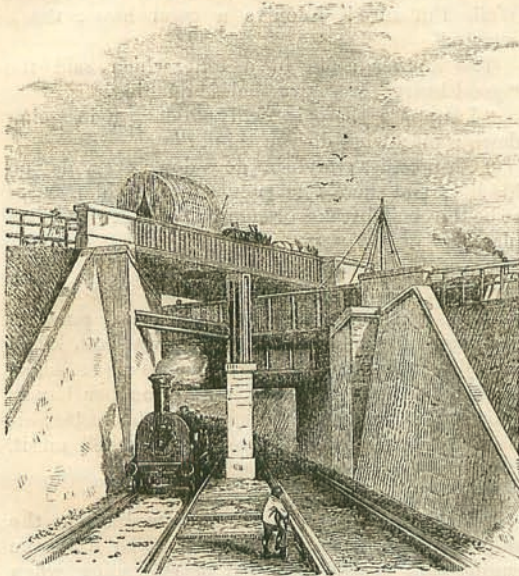


BRIDGE OVER THE TAMAR AT SALTASH.

river Tamar, at Saltash, by Mr. Brunel, for the line of the Cornwall Railway. The whole structure consists of nineteen spans or arches. Seventeen of these are wider than the widest arches of *Westminster Bridge*, and were constructed with comparatively little difficulty, as they merely lead from the hills on either side to the edge of the water. The other two overleap the river, 900 feet wide, resting upon a pier in the centre, the erection of which is the prime feature of the work. There was no natural rock left bare by the ebbing tide, as in the case of the *Britannia*, to serve as a foundation, while some seventy feet of sea-water, with twenty feet of mud and gravel, lay between the engineer and a firm basis. A coffer-dam for such a depth, and in such a tide-way, was out of the question; but, by a most ingenious application of the coffer-dam principle, what seemed an insuperable obstacle was at last overcome. An immense wrought-iron cylinder, 100 feet high, and 37 feet in diameter, weighing upwards of 300 tons, was made and sunk exactly on the spot whence the masonry was to rise; and the water having been pumped out, the workmen descended to clear away the mud and gravel from the subjacent rock. A noble pile of granite was built within the cylinder, up to the level of the water, as a foundation for four ponderous columns of iron, octagon in shape, which form the visible pier. The total length of the structure from end to end is 2240 feet, very nearly half a mile, and 300 feet longer than the entire stretch of the *Britannia Bridge*. It was opened by the Prince Consort in May, 1859, and is called the *Albert Bridge*.

Structures raised to carry a roadway across a valley, with or without a stream, in order to avoid

the acclivities, or over a plain, to acquire a certain level, take the name of viaducts, and when arched, are, properly speaking, viaduct-bridges. They have been constructed in great numbers and of vast magnitude, to meet the necessities of railways, and

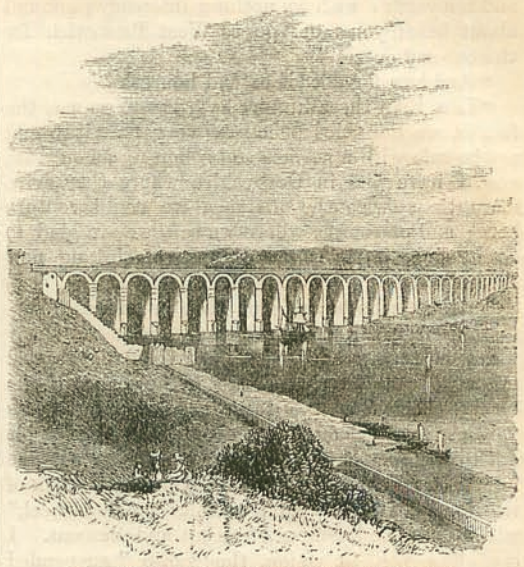


BRIDGE OVER THE BRENTFORD AND GREAT WESTERN JUNCTION.*

are commonly resorted to where a high level has to be gained, and materials for an embankment may be scarce. The whole of the London and Greenwich Railway may be said to be one viaduct, consisting of 878 arches; but their span, of 18 feet, and height of 20, are very inferior when compared with some subsequent examples. One of the most beautiful and magnificent carries the Chester and Shrewsbury Railway across the vale of Llangollen, at the height of 150 feet above the level of the Dee, upon 19 arches of 90 feet span. The outline of this work gives grace to the structure without impairing its strength. Viewed from beneath, its bold proportions are very striking, and seen from any point, its chaste style and attractive finish excite admiration. With the exception of the entradoes of the arches, which are composed of a blue kind of brick, the whole is built of stone, of a rich and effective colour. But the Tweed Viaduct, taking into account its greater length, while not so lofty, is the largest stone viaduct in the world, and was constructed under greater natural difficulties, owing to the apparently hopeless task, at first, of securing a firm foundation in the loose sandy strata. It contains upwards of a million cubic feet of masonry, and in the inner portions of the arches there are

* This is perhaps the closest specimen of engineering in the world. It was necessary at almost the same point for the railway to dip beneath the road from Hounslow to Hanwell, and also under, at a smaller depth, the Grand Junction Canal. An ordinary engineer would have made two bridges; it is, however, very cleverly united in one. There is another bridge showing similar skill, near Ambergate, on the Midland Railway. The railway crosses a small river, and is itself at the same point crossed by the Cromford Canal; a road which runs parallel with the railway (and is also crossed by the canal) in its turn, a few yards farther on, goes under the railway and over the river.

two millions and a half of bricks. Upon the completion of the work, in August, 1850, it was opened by the Queen, on her annual tour to Scotland, who ordered it to be called the Royal Border Bridge.*



RAILWAY VIADUCT OVER THE TWEED AT BERWICK.

THE BLACK COUNTRY.

CHAPTER IX.—LIONS OF THE BLACK COUNTRY.

THERE was excitement prevailing in the L. R. parsonage, for a pic-nic was on foot, and we were all agog preparing for it. When I say a pic-nic, I would not for a moment be understood to mean one of your ordinary, common-place, every-day sort of affairs, to a castle, or a wood, or a field, or a hill. We were going down a coalpit—a pit belonging to our friend Mr. Greystone—and down which he graciously purposed himself to accompany us. He had become a frequent visitor at the vicarage, and the interest he took in Mr. Barry's garden was wonderful.

"I must have you down a pit, Miss Ingram," he had said more than once; "you would never forgive yourself if you left the Black Country without seeing all the lions."

I think she would, for she was an arrant coward, but of course, under such circumstances, had nothing for it but to be "most anxious;" "so curious about the working of the pit." "Did the coal lie in lumps at the bottom, ready to be drawn up, or had it to be cut out?" "Yes, indeed, she must go down and learn all about it; there was nothing she liked so much as exploring."

Well, everything was arranged, the pic-nic agreed upon, and the day fixed. I may remark, that only the "nic" was to be in the mine; the "pick" was to come off afterwards, at Mr. Greystone's house, as more conducive to appetite.

* "Our Home Islands. Their Public Works." By the Rev. T. Milner, M.A., F.R.G.S., a most interesting volume, published by the Religious Tract Society.