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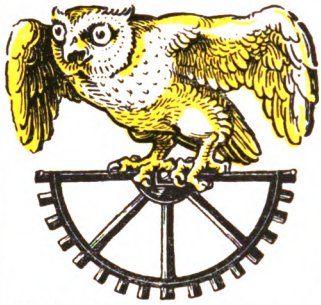

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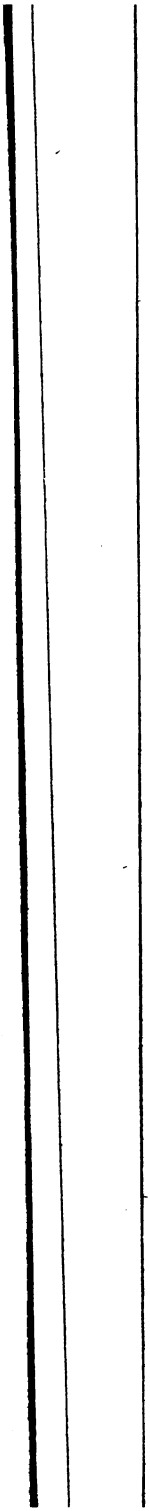

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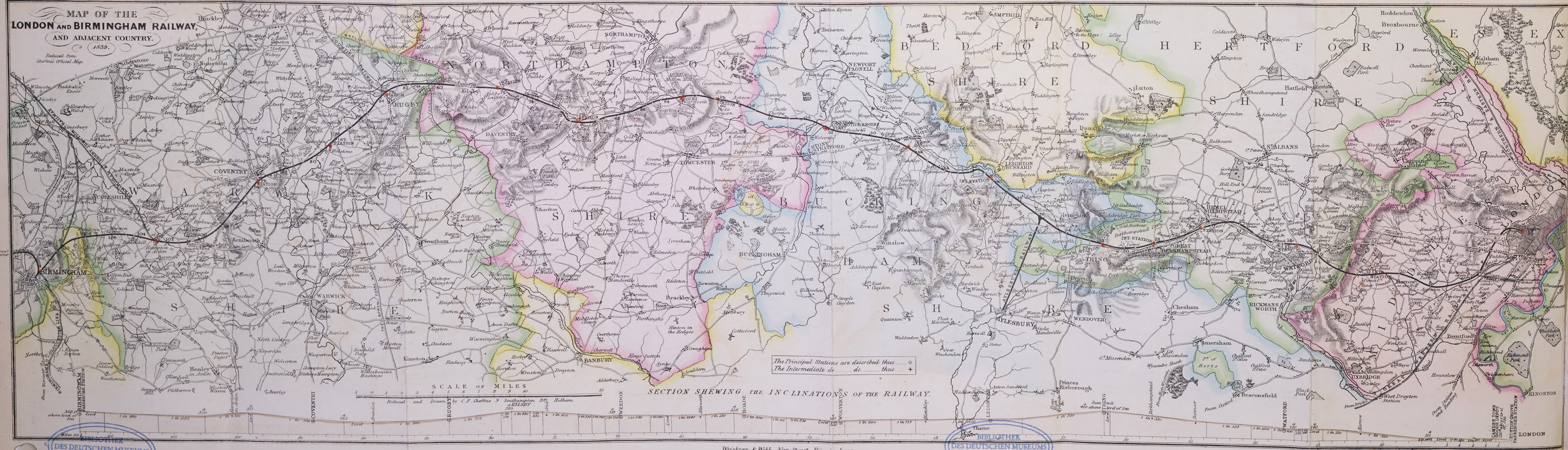
MAP OF THE LONDON AND BIRMINGHAM RAILWAY, AND ADJACENT COUNTRY.

1839.

Reduced from Charles's Official Map.



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THE
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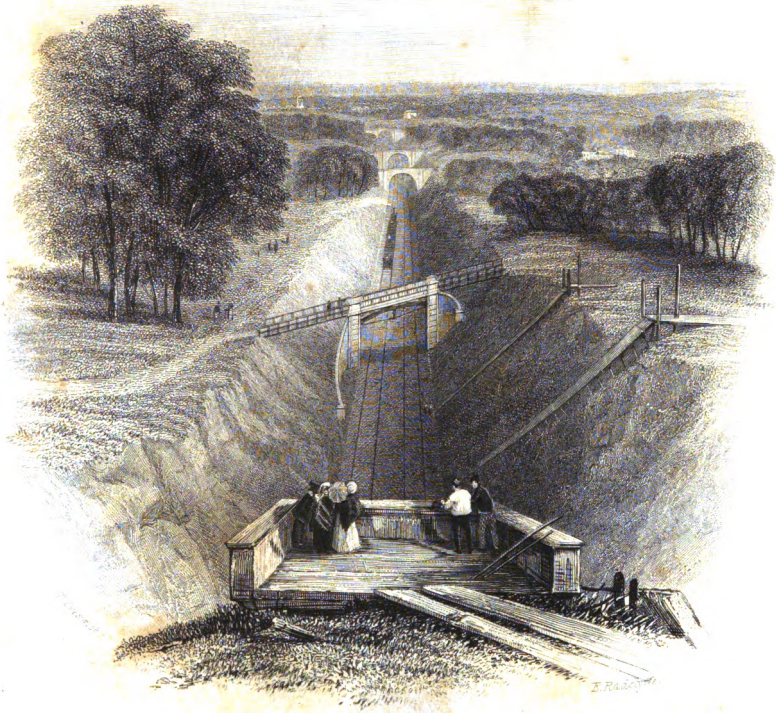
RAILWAY.



View from the top of Kilsby Tunnel,

looking towards Rugby.

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THE

LONDON AND BIRMINGHAM RAILWAY;

WITH

THE HOME AND COUNTRY SCENES

ON EACH SIDE OF THE LINE;

INCLUDING

SKETCHES OF KENILWORTH, LEAMINGTON, WARWICK, GUY'S CLIFF, STRATFORD, &c.

BY

THOMAS ROSCOE, ESQ.,

(AUTHOR OF "WANDERINGS AND EXCURSIONS IN WALES.")

ASSISTED IN THE HISTORICAL DETAILS

BY PETER LECOUNT, ESQ., F.R.A.S., CIVIL ENGINEER,

Who has been connected with this Railway from its commencement.

WITH A MAP OF THE LINE,

EIGHTEEN FINE STEEL PLATES,

AND NUMEROUS WOOD ENGRAVINGS.

LONDON:

CHARLES TILT, FLEET STREET.

WRIGHTSON AND WEBB, BIRMINGHAM.

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PREFATORY NOTICE.

When new and interesting facts regarding the progress of *steam-science*—for it has now assumed a nomenclature of its own—continue to excite popular wonder and admiration,—when a voyage across the Atlantic is thought little more important than a trip in one of our pleasure yachts, it would be strange, indeed, were the completion of the most extensive and magnificent Railroad in Great Britain to produce no feelings of national exultation, or to be allowed to go unduly celebrated. The mind is lost in amazement as it contemplates so vast and splendid a structure in all its bearings, in its yet undeveloped powers, and in its future results and influences upon the resources of a great country. Nor would the most full and particular history of the details connected with its formation, assisted by the most varied and beautiful illustrations—such as have been attempted in the following work—convey a just idea of its magnitude and importance. The effect can only be adequately realized by *ocular* observation; and its vast capabilities seem, as it were, to be revealed to the eye, as its grand successive trains—filled with a world of business and pleasure—come sweeping majestically by.

If we look back at what has already been accomplished within the present century, how strange and unlimited a prospective unfolds itself, connected with this invention, on trade and commerce—on all the social relations and intercourse of life,—and most of all in the rapid interchange of thought and communion of interests it will create; and this too resulting from a single discovery, as yet in its effects but imperfectly applied in traversing both land and sea. While it is impossible, however, to estimate the extent and im-

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portance of this discovery, the more immediate and prominent advantages are already beginning to develope themselves, and will ere long become conspicuously apparent. These are felt and appreciated by the public at large in the conveyance of intelligence by the posts; in a gradual equalization in the value of all property and productions; and in a more equal diffusion of the town and rural population, by the increased intercourse opened with remote districts, and with the most distant coasts. Nor is it a less striking and remarkable feature of this unconscious yet beneficent power to diminish, in a vast ratio, the amount of human suffering and toil,—even anxiety and mental pain,—by the rapid transmission of necessary and important intelligence of whatever nature.

Another attribute, no less attractive, of this wonderful power is that, hand in hand with profit and instruction, the most distant scenes are brought within our view. The beautiful, the picturesque, and the sublime,—afar in the deep recesses of the lake and mountain splendours of our islands, or of foreign lands,—will no longer be described as a marvel and a dream; they will become obvious to all—the inheritance of the most plodding and industrious, as of those who lord it over the soil. Already in Belgium and in France,—and wherever there is any approach to public prosperity by means of just and equal laws, so as to enable the GREAT PUBLIC to avail themselves of the conveniences of life, and especially where cheap railroads are the order of the day,—we see what astonishing results have been produced. With the increase of international intercourse, the contrast will become hourly more perceptible; and it will surprise the manufacturer and artizan of England to find that Brussels and Antwerp, with a population less by one half, make the returns of their railroad almost fourfold as compared even with the Liverpool and Manchester Railway.

There are some curious and interesting facts recently made known, which tend to throw fresh light upon the comparative developement of the resources of a country under the old system and under the newly applied powers of steam. But for the depressing influences under which this country labours, the astonishing effects of increased facility of intercourse would have been more decidedly

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manifested. Although its advantages are not confined to any particular country or district, they ought to be most strikingly exhibited in a rich commercial community. High fares on a railway operate like a tax upon other commodities; they render railroads a luxury,—a medium of enjoyment only for certain classes; while the extent to which intercourse may be carried by cheapness and facility, like the consumption of any untaxed article, is incredibly great even with a small population, and far beyond mere numerical superiority with a preventive price. This fact is well worth consideration, especially with regard to the great lines of road where population, rather than wealth and a privileged class, abounds, and must decide its ultimate prosperity.

But this gratifying fact,—so satisfactory to the companies and proprietors of Railroads who consult their real interests,—was still more clearly elucidated by the establishment of the *Omnibus Conveyance;* in the success of which, neither the number nor the facility of intercourse, but the low price, was the main point; and for this the proprietors were indebted to the example set them by those of Paris. Owing to this single cause, the Omnibus system has continued steadily increasing, and is still extending itself. How surprising, for the same reason, is the amount of passengers daily carried by the steamers on the Thames! During one year, more than five hundred thousand persons were conveyed to Greenwich, and three hundred thousand to Woolwich and Blackwall, while the hundreds of thousands carried to the various watering-places far exceeded these; and it is a singular fact, that land conveyances for the same destinations, in proportion to their cheapness, increased with almost equal rapidity. Within the present century, there were only two coaches which ran between London and Woolwich; and now, the omnibuses *only* perform the same journey forty-eight times in each day. Within the last half century, there was not a single coach which ran between London and Horsham, in Sussex; and, for nearly forty miles, there lay but one wretched road for the pedestrian and the horseman: at this time there are no less than thirty coaches which run between these places, and the traffic of goods exceeds forty thousand tons in the year. The passengers on the

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Stockton and Darlington Road increased more than fourfold; and, from three hundred, those on the Bolton Railway increased up to two thousand five hundred per week. Since the opening of the Newcastle and Carlisle Road, the coaches licensed to carry from three hundred and forty-six to six hundred and eighty-six, to and fro, now carry fifteen hundred and ninety-six, on the average, every week. Upon the Dundee and Newtyle Line, the travellers have risen from some four thousand to the enormous increase of fifty thousand. It is well known that on the Liverpool and Manchester Railway the numbers have more than quadrupled, and are yet continuing to increase; and if farther evidence were wanting of the beneficent effects of opening good roads, and facilitating conveyance, Ireland,—even obstinate and irreclaimable Ireland,—affords it in abundance. The traffic and intercourse between Great Britain and Ireland are calculated to have augmented twenty-fold since the introduction of steam navigation; what must be the results, as regards internal improvements, in a country so fertile and productive, from the establishment of inter-provincial Railroads? Aided by the British steamers alone, a change has already been effected in the manner of transacting business, and with the same beneficial results as have been derived from the London and Birmingham and Liverpool Lines, and which are rapidly extending. In the same way as the tradesmen of London now visit the adjacent towns, the country dealers repair to the metropolis, and those in Ireland think it worth while to come to England to sell their goods and make purchases, in preference to employing agents; can we picture to ourselves the amount of intercourse and general traffic when, in addition to the steamers, we have numerous Lines of Railroad intersecting both Great Britain and Ireland? And can we calculate, when that period shall arrive, what must be the amount of trade and travelling upon this most splendid and admirably finished road in the world? With such results almost within its grasp, this magnificent establishment,—no longer a gigantic enterprise and speculation which shook the faith of the most sanguine,—may well incite the whole kingdom, and even foreign countries, to a spirit of emulation and rivalry.

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LIST OF PLATES.

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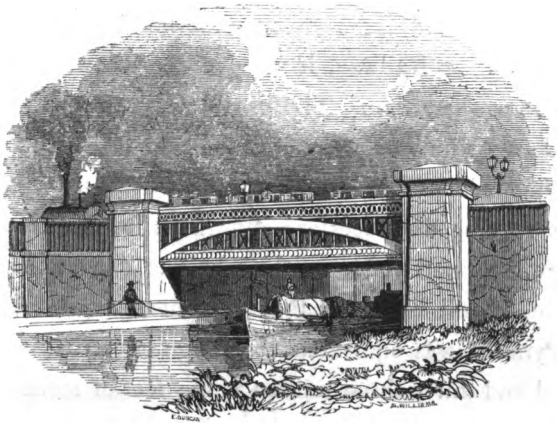

RAILWAY BRIDGE OVER THE REGENT'S CANAL.

DIVISION FIRST.

CHAPTER I.

THE London and Birmingham Railway is unquestionably the greatest public work ever executed, either in ancient or modern times. If we estimate its importance by the labour alone which has been expended on it, perhaps the Great Chinese Wall might compete with it, but when we consider the immense outlay of capital which it has required,—the great and varied talents which have been in a constant state of requisition during the whole of its progress,—together with

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the unprecedented engineering difficulties, which we are happy to say are now overcome,—the gigantic work of the Chinese sinks totally into the shade.

It may be amusing to some readers, who are unacquainted with the magnitude of such an undertaking as the London and Birmingham Railway, if we give one or two illustrations of the above assertion. The great Pyramid of Egypt, that stupendous monument which seems likely to exist to the end of all time, will afford a comparison.

After making the necessary allowances for the foundations, galleries, &c., and reducing the whole to one uniform denomination, it will be found that the labour expended on the great Pyramid was equivalent to lifting fifteen thousand seven hundred and thirty-three million cubic feet of stone one foot high. This labour was performed, according to Diodorus Siculus, by three hundred thousand, and by Herodotus by one hundred thousand men, and it required for its execution twenty years.

If we reduce in the same manner the labour expended in constructing the London and Birmingham Railway to one common denomination, the result is twenty-five thousand million cubic feet of material (reduced to the same weight as that used in constructing the Pyramid) lifted one foot high, or nine thousand two hundred and sixty-seven million cubic feet more than was lifted one foot high in the construction of the Pyramid; yet this immense undertaking has been performed by about twenty thousand men in less than five years.

From the above calculation has been omitted all the tunnelling, culverts, drains, ballasting, and fencing, and all the heavy work at the various stations, and also the labour ex-

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pended on engines, carriages, wagons, &c.; these are set off against the labour of drawing the materials of the Pyramid from the quarries to the spot where they were to be used—a much larger allowance than is necessary.

As another means of comparison, let us take the cost of the Railway and turn it into pence, and allowing each penny to be one inch and thirty-four hundredths wide, it will be found that these pence laid together so that they all touch would more than form a continuous band round the earth at the equator.

As a third mode of viewing the magnitude of this work, let us take the circumference of the earth in round numbers at one hundred and thirty million feet. Then, as there are about four hundred million cubic feet of earth to be moved in the Railway, we see that this quantity of material alone, without looking to any thing else, would, if spread in a band one foot high and one foot broad, more than three times encompass the earth at the equator.

It will be evident that such a work as this could only have been undertaken in a country abounding with capital and possessing engineering talent of the highest order. The steps by which the science of Railways has arrived at its present position were slow yet progressive. Railways of wood and stone were in use, as well as the flat iron or tram-rail, in the middle of the seventeenth century, particularly among the collieries of the north, and were gradually improved from time to time; they still however retained a character totally distinct from those structures which will soon form the means of transport through all the principal districts of the kingdom.

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At length we lived to see the splendid creations of GEORGE STEPHENSON, one of those gifted beings who are destined by one unerring stroke to annihilate those bonds which limit the fame of ordinary men. Watt and Stephenson are of no country; they belong not even to Europe; they are citizens of the world in the truest and the best meaning of the word. Centuries hence, when with few, very few, exceptions, even the deeds as well as the names of the heroes, the conquerors, and the politicians of the present day will have become engulphed in one common oblivion, those of Watt and Stephenson will be found rolling imperishably down the stream of time, and fertilising the whole habitable globe with the magnificent creations of their genius.

The first performance to which Mr. Stephenson directed the resources of his mind was the Stockton and Darlington Railway. This was certainly a great attempt; the ice was broken, the old track was fearlessly abandoned; yet it was but the planting of that ladder by which he was to ascend to his present eminence,—he scaled that eminence on the Liverpool and Manchester line. It was there the system was shown in all its bearings, and at one blow a full and entire revolution was effected in all our habits and manners, and in our customs and feelings,—a revolution which every person will confess is of such extent that its consequences and its bearings on all the circumstances of civilised life are not capable of being even guessed at, but which even now almost justifies Bishop Wilkins's idea, that in some future time a man would be as likely to call for his wings as he then did for his boots. It is certainly a splendid sight to see one man, by the magic powers of his mind, more than realising the far-famed boast of

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Archimedes, taking a railway for his fulcrum, and moving the world.

It will readily be supposed that in such an enterprising country as this a successful experiment like that of the Liverpool and Manchester Railway, would at once be followed out in all directions, bearing in mind that the expense of such enormous works will at all times limit them to main lines of travelling, in order to insure a proper return of capital to the spirited individuals who embark their property in them. Lines from the Liverpool and Manchester Railway to Birmingham, and from Birmingham to London, were among the first which were projected; and, in fact, surveys and other preparations for the London and Birmingham line were in progress prior to the opening of the Liverpool and Manchester Railway, (September, 1830,) and the projectors were waiting only the successful result of that event to mature their plans. Some of these surveys were made as far back as 1825.

In 1830 two lines were proposed; one by Sir John Rennie, taking the Banbury and Oxford line of road, and the other by Mr. Giles, taking its course by the way of Coventry. Companies were formed in each case, and were duly marshalled against each other, with their various staff appointments fully organised, directors, secretaries, engineers, solicitors, bankers, &c., and great were the rejoicings in Westminster Hall.

If the battle had been waged, and if any poet could have been found, capable of bringing into harmonious numbers such uncouth sounds as cuttings and embankments,—blocks and sleepers,—and slopes of one thousand eight hundred to one,—Homer's Ghost might have trembled till all Pluto's

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dominions gave a simultaneous sympathising shake, like those comical clocks furnished with Hardy's "Noddy,"* where the one cannot rejoice in a little irregular motion without the other telling tales by instantly wagging about too. But fortunately, all parties were too wise, and they deemed it much more prudent, instead of throwing away their money in an uncertain Parliamentary contest, at once to consult, as far as possible, the interest of their several proprietaries, by selecting that line which a majority should consider the best, and thus unite the two companies into one.

George Stephenson had, a little prior to this, been engaged by the parties who had chosen the Coventry line for the Railway, and as he also gave his opinion in favour of that route, it was finally decided that the London and Birmingham Railway should go *via* Coventry, and George Stephenson and his Son were appointed engineers to the now united 'London and Birmingham Railway Company.'

It may be thought that this period of time is passed over too lightly; but it is best. Why should the party feelings, the hopes and the fears, the disagreements, the quarrels, and the heart burnings of five or six years ago, be perpetuated? It would be in excessive bad taste, to say the least of it, and anything but amusing to the public at large; all parties did then what all have done since, that is to say, they strained every nerve for the interests of the proprietors to the best of their ability and judgment, and who could do more? It may

* This philosophical little instrument, for which the talented Mr. Hardy received a Medal from the Society of Arts, is an inverted pendulum which moves isochronally with that of the clock on which it is put, and shews when the clock is not firmly fixed.

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be just observed, that through the proprietors principally residing in Lancashire, and from their proximity to the Liverpool and Manchester line, being to a certain extent practical men, they were better able to take a leading part, and to judge what was most advantageous; and they had heavy votes enough to oblige their judgments to be executed.

There was this object also to be kept in view, in forming such a line as the London and Birmingham Railway, that it is a grand trunk from the metropolis towards the northern part of England, and that numerous branches would in all probability fall into it at no very distant period; that the Irish traffic would all come along it, and most probably the Scotch. It was also to be remembered, that not only the towns near the line would be benefited, but others far distant.

The impulse to travelling which has been given from the facilities afforded by railways, and the cheapness of this mode of conveyance, has been astonishing; and will, of course, continue to improve the more they are brought into use. The increase has varied in all proportions up to the ratio on the Stockton and Darlington line, where the passengers are now eighty times as many as they were before it was in operation.

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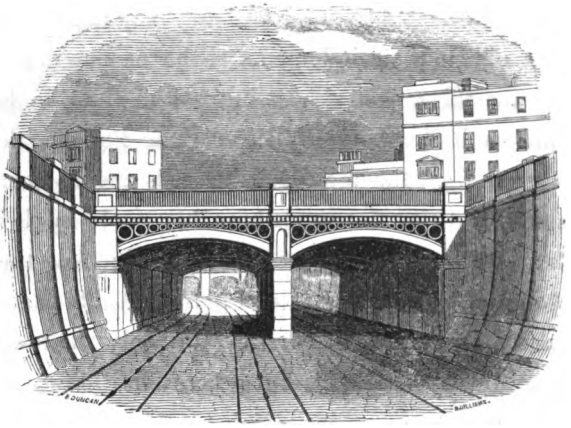

EXCAVATION BENEATH THE HAMPSTEAD ROAD.

CHAPTER II.

On September the 11th, 1830, the two Companies united themselves, selecting eight persons from each as a provisional committee. Much had been done previously to this in preparing the public mind, and in endeavouring to obviate opposition, which, however, still continued very strong among those who either could not or would not see the advantages of establishing this means of communication. This has, however, perhaps worked good rather than evil; for it could only be met by the free use of the press, in order to enlighten all those who were willing to receive information on the subject

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of railways, and this was done to such an extent that it soon became apparent our danger would be in having too many railways instead of too few.

In the latter end of 1830 a committee of survey was appointed to establish a regular communication with the Engineers, by way of periodical reports, and to correct errors, make improvements, confirm friends, and conciliate enemies. In October, Messrs. Stephenson and Son reported that the line, as laid down by Mr. Giles, from Islington to Chipping Barnet, South Mims, Leverstock Green, and Hemel Hempstead, was exceedingly rough, and incurred deep and extensive excavations, and that they would recommend it to leave London near Hyde Park, running almost parallel with the Edgeware Road to Watford, Hemel Hempstead, Great Berkhampstead, and Ivinghoe.

It was also proposed to enter Birmingham on the south side by a tunnel, so as to gain a central *terminus*. Another plan was to pass up the Tame Valley from Stone Bridge, and join the Grand Junction Railway at Wednesbury, having a branch line to Birmingham; this was done with a view to the advantages of the whole line from London to Liverpool. Both companies were to have stations in Broad-street,—the Grand Junction on the north-west side, on a piece of ground of about seven and a half acres; and the London and Birmingham on the south-east side, containing about nine acres, with another station at the Bell Barn Road.

In the Summer of 1831 Mr. Creed examined another line, with the mountain barometer, from Northampton, through Bedford, Baldock, and Hutford, to near the West-India Docks; another line through Buckingham, Brackley, and

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Warwick was surveyed, and many other attempts at improvement were made, each line having its advantages and disadvantages; the chief things next to the traffic to be kept in view being to select that line where there is the least difference between the highest and lowest levels, and also that which is least expensive, even if it is not the most direct.

The country between London and Birmingham is a series of basins or low districts, separated from each other by considerable ridges of hills; the object to be gained was, therefore, to cross the valleys at as high a point as possible, and the hills at as low an one. The low districts are the London basin—the valley of the Colne, extending from Brentford by Watford, to St. Alban's,—the lowland in the neighbourhood of Leighton Buzzard, on to Stoke Bruern,—the valley of the Nen, in which is Northampton,—and the basin of the Avon; which last, from its great depth, low level, and abrupt termination on the south, by the high ridge of hills on which Daventry, Kilsby, and Crick are situated, and on the north side by the Meriden ridge, required particular attention.

The high grounds which bound these districts are the county boundary between the London basin and the valley of the Colne,—the Chalk ridge, at Ivinghoe, which rises between the Colne valley and the Leighton Buzzard district, —the Blisworth ridge, which forms the southern side of the valley of the Nen,—and the Kilsby and Meriden ridges, forming the abrupt sides of the valley of the Avon. The whole will, therefore, stand thus:—

1. The basin at London formed by the Thames.
2. The summit at Oxhey, near the division of the counties of Middlesex and Hertford.

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3. The basin of the Colne river.
4. The summit at Tring.
5. The basin of the Ouse, near Stoney Stratford.
6. The summit at Blisworth, opposite Towcester.
7. The basin formed at Weedon by the streams flowing into the river Nen at Northampton.
8. The summit at Kilsby, opposite Daventry.
9. The basin of the river Avon, crossed near Wolston, about five miles south of Coventry.
10. The summit of the Meriden ridge.
11. The basin at Birmingham formed by the river Rea, which flows into the Tame.

From this sketch of the nature of the ground it is evident what care was required in searching for the best line of road. Mr. Robert Stephenson examined the country in the Autumn of 1830, and was ordered to prepare the necessary plans and sections to deposit with Parliament in the November of that year. The time, however, was much too short; and it was only by great haste and force of numbers that the preliminary step of depositing these plans was accomplished.

The standing orders of the Houses of Parliament, although not then so strict or minute as in the present day, required more labour and closer attention than the time would admit of, and the result of all this hurried preparation was by no means satisfactory, and particularly so to the Engineer, who felt that he had not been able to devote that time and consideration to the project which it demanded. After some further preliminaries, therefore, it was determined to defer the application to Parliament for a bill till the following year, and thus give the Engineer the opportunity of examining and selecting

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such a line as he could confidently report on as being the best the country would afford. When this was done, the plans and sections were deposited with Parliament in the November of 1831, showing a line almost identical with that which is now executed, where the steepest gradient (except where the line has been extended from Camden Town to Euston Square) is sixteen feet per mile.

During the preparation of these plans it was, of course, necessary that, before they could be made out, the Surveyors and Engineers should go upon the different properties through which the line was to pass, for the purpose of taking the necessary levels, and obtaining the data on which they were to found their drawings. This is a subject which merits the attention of our legislators in no small degree. Parliament orders certain plans and sections of any proposed public work, for which an act is sought to be obtained, to be deposited with their clerk, and with all the respective clerks of the peace for the counties through which such public work is to pass. This is a wise and prudent regulation, as it enables every landed proprietor, or other person interested in property which will be interfered with by the work in question, to go and inspect the nature of this interference, and thus ascertain if any and how much damage will be done to his interests, and to provide against injury, by making a special agreement for the necessary compensation; or he may oppose the bill altogether.

This provision is so far good,—but no farther. When Providence ordained that human beings should eat, it was at the same time ordained that the earth, on which they were to live, should afford them food. The legislature has not thought

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it necessary to follow this wise example it has ordained that plans and drawings shall be made, but it has not provided the means by which this is to be done; consequently the engineers and surveyors are completely at the mercy of any opponent who holds land through which the projected line is to pass, as he can at all times prevent them from making the necessary surveys. Indeed, if he be not an opponent, but happen to have had a bad digestion, or his bilious organs disturbed from any cause whatever, he warns them off his land, and they are left to make their survey how they can, while the measure in question, no matter how advantageous to the public, is put in jeopardy through the want of one or two of Abernethy's blue pills.

A great deal of this opposition was encountered in making the surveys for the London and Birmingham Railway, and although, in every case, as little damage was done as possible, simply because it was the interest of those concerned to conciliate all parties along the line, yet, in several instances, the opposition was of a most violent nature; in one case no skill or ingenuity could evade the watchfulness and determination of the lords of the soil, and the survey was at last accomplished at night by means of dark lanterns.

On another occasion, when Mr. Gooch was taking levels through some of the large tracts of grazing land, a few miles from London, two brothers, occupying the land, came to him in a great rage, and insisted on his leaving their property immediately. He contrived to learn from them that the adjoining field was not theirs, and he therefore remonstrated but very slightly with them, and then walked quietly through a gap in the hedge into the next field, and planted his level

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on the highest ground he could find,—his assistant remaining at the last level station, distant about one hundred and sixty yards, apparently quite unconscious of what had taken place, although one of the brothers was moving very quickly towards him, for the purpose of sending him off. Now, if the assistant had moved his staff before Mr. Gooch had got his sight at it through the telescope of his level, all his previous work would have been lost, and the survey must have been completed in whatever manner it could have been done;—the great object, however, was to prevent this serious inconvenience. The moment Mr. Gooch commenced looking through his telescope at the staff held by the assistant, the grazier nearest him, spreading out the tails of his coat, tried to place himself between the staff and the telescope, in order to intercept all vision, and at the same time commenced shouting violently to his comrade, desiring him to make haste and knock down the staff. Fortunately for Mr. Gooch, although nature had made this amiable being's ears longer than usual, yet they performed their office very badly, and as he could not see distinctly what Mr. Gooch was about, the hedge being between them, he very simply asked the man at the staff what his (the enquirer's) brother said. "Oh," replied the man, "he is calling to you to stop that horse there which is galloping out of the fold yard." Away went clodpole as fast as he could run, to restrain the unruly energies of Smolensko the Ninth, or whatever other name the unlucky quadruped might be called, and Mr. Gooch in the meanwhile very quietly took the sight required; he having, with great judgment, planted his level on ground sufficiently high to enable him to see over the head of any grazier in the land; but his clever assistant,

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as soon as he perceived that all was right, had to take to his heels, and make the shortest cut he could to the high road.

In another instance, a reverend gentleman of the Church of England made such alarming demonstrations of his opposition, that the extraordinary expedient was resorted to of surveying his property during the time he was engaged in the pulpit, preaching to his flock. This was accomplished by having a strong force of surveyors all in readiness to commence their operations, by entering the clergyman's grounds on the one side at the same moment that they saw him fairly off them on the other, and, by a well-organised and systematic arrangement, each man coming to a conclusion with his allotted task just as the reverend gentleman came to a conclusion with his sermon; and before he left the church to return to his house, the deed was done—the sinners had all decamped,

> "And like the baseless fabric of a vision
> "Left not a wreck behind."

These are a few specimens of what is really a very great hardship, and a hardship which might easily be prevented by Parliament. Whenever a measure of importance to the public comes to such a stage as to render surveys necessary, in order to comply with the standing orders of either branch of the legislature, the parties should be enabled to comply with those orders, or it is manifestly the old plague of the Israelites re-enacted—making bricks without straw.

At last, however, the business was all completed, and the share list being filled, a bill to enable the Company to make a Railway from London to Birmingham was read a first time on February the 20th, 1832, and a second time on February the 28th, 1832, after a division of one hundred and twenty-

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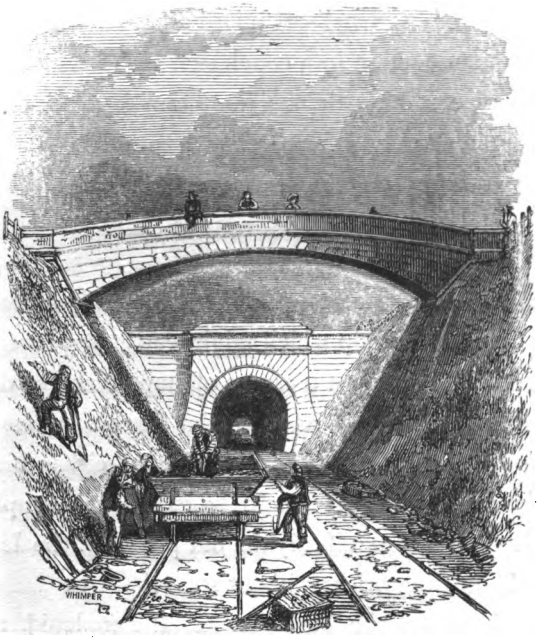
five to one hundred and forty-six. It went into committee in the Commons, April the 5th, 1832, and witnesses were examined till the 13th of April; the committee then adjourned, and the examination was resumed on the 21st of May, and on the 5th of June the Bill passed the committee, after the examination of nearly a hundred witnesses of various kinds, among whom were merchants from London and Birmingham, manufacturers, carriers by land and water, farmers, gardeners, graziers, &c.



BEECHWOOD TUNNEL, NEAR COVENTRY
And Kenilworth Road Bridge.

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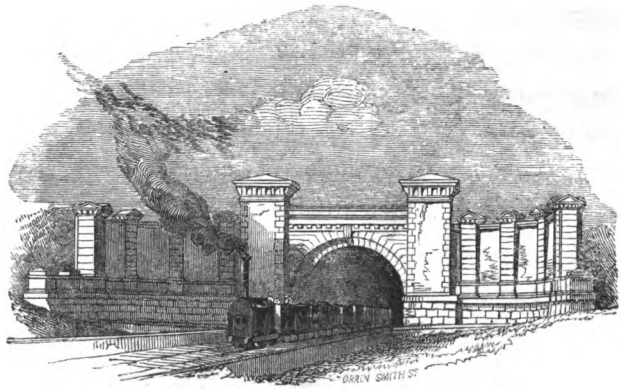

ENTRANCE TO THE PRIMROSE HILL TUNNEL.

CHAPTER III.

It may be safely said that no private bill was ever more strictly scrutinized than was that of the London and Birmingham Railway; the opposition to it being confined more to the cross examination of the witnesses in its favour than in producing any direct evidence against it, which, it must be confessed, would have been rather a difficult task. There was not a single fact proved against the great utility of the measure, while its advocates clearly established in its support the following important points,—viz., that the exporting of goods suffered material loss and great inconvenience by the present slow mode of traffic,—that goods for the Baltic trade were often detained by the frost for the whole winter, through a very short delay in shipping them,—that consider-

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able orders were frequently lost from the impossibility of completing them in time,—that merchants keep large stocks of many sorts of articles in London to meet these emergencies at a consequent outlay and loss,—that some particular trades have been almost ruined through the impossibility of getting goods forwarded in time, the coach proprietors having refused to take articles of considerable weight,—that nothing is so invaluable in the export trade as expedition and certainty,—that in fancy articles it is almost indispensable, orders being frequently sent subject to the condition of their being shipped in a particular vessel,—that returns of money were sometimes made in eighteen months instead of nine, through this delay in the shipment of the goods ordered, —that farmers would be able to send to London a different kind of produce altogether, and a much better one, particularly lambs, calves, dairy produce, &c., saving also a great expense in their carriage;—besides which, cattle were often driven till their feet were sore, and they could go no further, they were then sold on the road for what they would fetch. In the same manner sheep were continually being left in every town on the road at a ruinous sacrifice in price,—that many estates along the line of railway would be increased in value at least thirty per cent., the consumer being also benefited as well as the producer.

It was also proved in evidence, that killed meat was repeatedly putrid in Summer before it could be sent to the proper market; that the cost of carriage limited the vast supply of manure to a short distance round London; whereas, by a railway, its application would be most materially extended,—that all cattle became deteriorated considerably

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when driven even a moderate distance to market, and produced a proportionally less price; for instance, a sheep driven eighty miles lost eight pounds in weight.

In addition to the speed and comfort of railway travelling, the cost would be reduced;—a person living at Malvern would require sixteen hours and a half to get to London, and pay forty-three shillings; while, by the railway, he would be eight hours and a half, at a cost of thirty-two shillings.

In these days of political agitation the rapid transmission of bullion forms a subject of considerable importance, and even one hour saved would be sometimes the means of preventing the stoppage of a bank. Marked evidence was given to this effect.

In like manner the rapid conveyance of troops was most essential. It was clearly shown that a lesser number would be required in any tract of country possessing railway conveyance, as they could be concentrated on any given spot, in aid of the civil power, in the same or shorter time than could now be done with a larger number of men; and the fact was stated, that a regiment of eight hundred men, and a large quantity of baggage, were only three hours in going from Manchester and being shipped at Liverpool.

On the Leeds and Liverpool canal, being the one most interfered with by the Liverpool and Manchester railway, the traffic had actually increased at the time, and it was a curious fact, that by the Stamp Office returns, there was one more coach licensed at Liverpool and Manchester the year after the railway was opened than the year before. Every coach but one had been taken off the road between those towns, but they were still running with the addition of one at the two *termini*, for the purpose of feeding the railway.

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It was also shown, that so invariably had it been found that land was benefited by a railway passing through it, that in advertisements for the sale of estates, this circumstance generally formed a part of the advantages detailed,—then, again, there were the vast sums expended in labour,—the materials bought from the surrounding country,—the lowering of the poor rates, not only by the employment given to the local population, but by the large payments to these rates by the railway companies themselves. The extensive cuttings were also taken advantage of for draining by the adjoining occupiers, and altogether new life was infused along the whole extent of country through which the works were progressing.

The above is a short abstract of the leading points which were proved in evidence before the House of Commons; it now remains to be stated what the probable cost of this great work would be, and what return for their risk and outlay the proprietors might reasonably expect.

The Estimate laid before Parliament was as follows:—

Excavations and Embankments	£179,000
Tunnelling	250,286
Masonry	350,574
Rails, Chairs, Keys, and Pins	212,940
Blocks and Sleepers	102,960
Ballasting and laying Rails	102,960
Fencing	76,032
Land	250,000
Water Stations and Pumps	3,600
Offices, &c.	16,000
Locomotive Engines, Wagons, and Coaches	61,000
Contingencies	294,648
	£2,500,000

Before drawing to a conclusion with the present work, we

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shall more particularly allude to the increase which has taken place in this sum. It will, therefore, be sufficient at present to say, by way of explanation, that in an undertaking of this kind there are certain works which are of a fixed nature, and which can be fairly taken at the current prices of the day; but there are also others variable both in quantity and price.

For instance, the engineer knows he has, at least, a certain quantity of earth to move, and that, as he crosses over or under a given number of public highways, he must have a determinate number of bridges. All these things are positive data for an estimate, and constitute the principal sums in what are called the contract works; these formed an item of £1,649,155. in the revised estimate of the engineer, and they were actually let for £1,621,821. or £27,334. below the estimate; to this £76,160. has to be added, for the extension from Camden Town, where the railway originally began, to Euston Square. (See Table in Appendix.)

From the great increase in prices, which took place almost immediately after the letting of the works, no less than seven contracts were thrown on the Company's hands, and of course these were the most difficult and expensive parts of the works, and in each case, the directors had to purchase all kinds of implements and materials at a vast expense, including five locomotive engines, while, from the times at which these seven contracts took to complete them, there was very little possibility of transferring these implements (technically called the Plant) from one contract to another. This, although a very expensive process, was the only one to be followed, or the line could not be opened under at least a year beyond the time contemplated.

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It is a well known fact, that from the great rise in prices there is hardly one of the contractors who has made a sixpence by the three years' labour, and some have absolutely lost money, but have spiritedly performed their engagements whenever it was possible for them to do so. The difficulties of particular works will be adverted to in a future place; in the mean time the reader may be reminded of another class, —namely, the variable one.

The contract works, consisting of definite portions of the whole, being let, as the land agents advanced in their labours, a series of what are called extra works arose; these consisted of bridges over private roads,—of bridges to join lands severed by the railway,—of culverts, drains, watering places, new roads, gates, fencing, approaches to bridges, &c., forming a large portion of the whole, and which could only be ascertained as the agreements were entered into between the owners of the land and the Company's agents.

It is obvious the engineer can have neither a knowledge of the extent of these, nor of their cost, except in a very general way; he only gains full information as he has extracts sent him from time to time from these agreements, shewing what has been consented to on the part of the company, and he then gives his orders for the various works to be done. It is evident therefore that the total cost of these constantly increasing and variable works, many of them, as in the case of bridges with extensive approaches, costing several thousand pounds, cannot be fully ascertained till the line is nearly completed.

Another variable class of items are those denominated additional works. These consist of alterations of various kinds which must constantly arise in all great undertakings, such

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as increasing the slopes in particular parts where, on cutting into the ground, it is discovered to assume a different character to that of the borings taken right and left of it, from which borings alone could a judgment be formed in the first instance; in some cases springs of water are cut into, and have to be drained, in others rock is come upon, where no geological indications, or any result from the borings, would lead any one to suspect its proximity; from similar causes bridges have to be enlarged in their foundations, and where the slopes have been increased, in their superstructure also; water has to be procured for the adjoining occupiers of land at considerable expence; and there is a constant and unavoidable increase in the outlay from these and other causes, over which no human foresight could, by any possibility, have the least control.

It could scarcely have been supposed that under the article of extra works, the following curious specimen of the impositions which the company has suffered, would have taken place. In one portion of the line, on the Birmingham division, some land was passed through in such a way that it was evident the proprietor required, in reality, no accommodation in the way of bridges at all. At the first outset, however, he demanded five bridges; but, in the course of the discussion, came down to four, with an equivalent in the price of the land. It was absolutely necessary to obtain the land, or the contractors would have been stopped in their operations, so that, after a great deal of argument, the Company was forced to submit to this enormity, and the agreement was signed, sealed, and delivered, guaranteeing to the proprietor a bridge at A, another at B, another at C, and another at D.

Soon after the money had been received the proprietor

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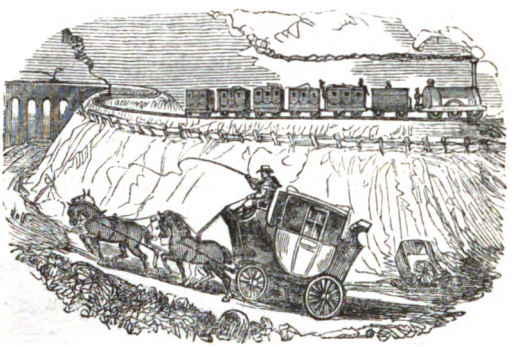
wrote to say, he thought he could dispense with a bridge at A, and if the company would give him about half its value he would do without it; of course as this would save expence it was agreed to, and bridge A done away with, the proprietor receiving about half what it would have cost in building.

When this quantity of hard cash had been a little time warming in his pocket, he discovered he could do without bridge B, and offered to commute that with the Company on the same terms as bridge A. This being agreed to and paid for, he in succession found out that he could dispense with bridges C and D on exactly the same terms; and thus every bridge he had so pertinaciously demanded, were one after the other found to be totally unnecessary, as every body knew very well at first; but it is to be supposed that he found it a very agreeable way of getting a few cool hundreds; at any rate such are the facts,—he has been paid for all the four bridges, none of which have been built.



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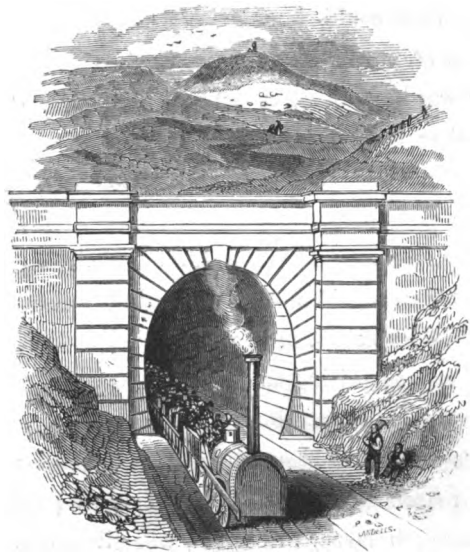

FRONT OF NORTH CHURCH TUNNEL.

CHAPTER IV.

THE compensations demanded from the Company by the proprietors of land and other premises on the line of the railway were enormous, and in many cases where no injury whatever was done, the land valuers having made their estimates upon the most liberal scale. All sorts of payments were required on the most frivolous pretexts, and even some of the opponents to the bill were obliged to be paid, in order to gain their consent to the measure. The sum of £3000 was given for one piece of land, and the extravagant amount of £10,000 for consequential damages, when instead of any damages being sustained the land has been improved; these and similar transactions soon run away with all reasonable

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estimates; and yet it is certain, that in every instance the best plan that could be devised was followed to procure the land on equitable terms, taking into consideration that to gain time was in most cases the principal object.

One rather original character sold to the Company some land, and was loud and long in his outcries for compensation, ringing the changes on all sorts of damages which the railway could not fail of bringing upon him. Well, his demand was paid, and his complaints were stopped. A few months afterwards a little additional land was wanted from the same individual, when, surprising as it may appear, for some adjoining parts of this land so deteriorated by the railway, on which the Company's works had brought such inevitable destruction, and for which reason so high a sum had been paid, he actually required a much larger price than was given him before, and on the Company expressing the surprise which was natural on hearing such a demand, he very coolly replied, "Oh, I made a mistake *then*, in thinking the railway would injure my property; it has increased its value, and, of course, you must pay me an increased price for it."

There was a case occurred which, although the amount involved was inconsiderable, will suffice to show the *animus* on the occasion. The drainage of a road was demanded from the Company, and the claimant would have undertaken it for a sum of money to be paid to him. It appeared, however, that the Company could do it much cheaper by taking the drain across the corner of one of his fields; this he refused to permit. Matters stood thus when he happened to be called to London, and after his return discovered that the Company had made a drain for him in his absence,

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having in fact quietly tunnelled through the corner of his field without committing a trespass.

The remaining part of the Parliamentary evidence which may be adverted to, is the probable result of the traffic that was to be expected on the line. Some time previous to the application to Parliament, the Company had secured the able services of Captain C. R. Moorsom, R. N., as one of their secretaries, and it was on a new and original plan of his that the writer of this article calculated the traffic then existing on the main roads and the surrounding country, which would be available to the railway when opened.

The way in which these things are usually prepared for Parliament, is so vague and undetermined as to merit no other name than a guess, and not a good one either; hence has arisen the common saying with all great undertakings of this kind, "halve the receipts and double the expenditure, if you wish to know any thing about it." In the present case, however, the traffic was actually counted on the roads during a fortnight, and the results thrown into a table, to which were added the probable traffic now existing, which at any rate *could* come along the line in less time, and for less money than by any other route; by this means, and by using the Stamp Office returns for all that coaching which was not actually counted on the direct road, a sure foundation was formed for a correct determination of what could be done, and as no increase on the traffic already existing was assumed for the additional facilities which the railway would afford, it is fair to conclude that the estimate is not too large, particularly as only part of the canal traffic, namely light goods, were taken into account. The result is contained in the Appendix at the end of this volume.

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The bill was read a third time in the Commons on the 19th of June, 1832. Its first reading in the Lords was on the 19th of June, the second reading on the 22nd of June. No division took place on either, and it was sent to the committee of the Lords on the 22nd of June, where a similar mass of testimony was again gone through for seven days, and notwithstanding the overwhelming weight of evidence in favour of the measure, and the total absence of all reasonable testimony against it, the bill was lost on the following motion by Lord Brownlow:—

"That the case for the promoting of the bill having been concluded, it does not appear to the committee that they have made out such a case as would warrant the forcing of the proposed railway through the land and property of so great a proportion of dissentient landowners and proprietors."

Thus a great public Company was stopped for twelve months from pursuing a project of such vast importance to the country at large, in almost every relationship of social life; and the proprietors, some of whom had been laying years out of their money, were put to the expense of no less than £72,869 before they were allowed to benefit the country by establishing one of the greatest public works ever achieved by man.

Yes, reader, in every half-yearly report of expenditure sent forth to the twenty-five thousand proprietors, foremost in the items is recorded the appalling fact, that public-spirited men who are willing to risk millions of their money, and lay out of part of it for seven or eight years, in order to complete such a splendid undertaking as the London and Birmingham railway, must, before they can obtain permission to commence this work, submit to place down upon their records

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as the first item of their outlay,—" Payments for obtaining the Act of Incorporation £72,868. 18s. 10d."

Operations had now to be commenced afresh; this was done in October, 1832, and plans and sections were deposited again with Parliament by the 31st of November, corresponding as nearly as possible with those of the preceding year, the only alteration being a slight change between Harrow and London, and an alteration in the *terminus* of the railway by stopping at the Hampstead road, near its intersection with the Regent's Canal, where the Camden Town station now is.

Much was said out of committee, during the progress of the bill, on the subject of a more direct line than that which had been chosen. Mr. R. Stephenson and Mr. Gooch spent a great deal of time in investigating this question, examining the country, and taking levels in all practicable directions, in order to ascertain the merits of the line referred to. This was intended to branch off from the present route near Tring, and leaving Aylesbury a little to the south-west, passing near to and on the easterly side of Bicester, thence on to Buckingham and Banbury, crossing the river Avon between Leamington Priors and Warwick, and joining the present line again in the neighbourhood of Hampton-in-Arden.

The saving in distance by this line would not have exceeded four or five miles, and in addition to the many difficulties and expensive works on this route, the crossing of the valley of the Avon, near Warwick, was at once a fatal objection:—the sixteen feet per mile, which is now the maximum rate of inclination, except on the Euston Extension into London, must have been abandoned if the proposed line had been selected.

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The valley of the river Avon forms one of the basins, or lowest points to be passed as has been before explained, and the intersection of high ground between it and Birmingham, called the Meriden ridge, one of the summits. On the present line the rate of inclination between the Avon and Meriden ridge is sixteen feet per mile only. Now on the direct line the Meriden ridge must have been crossed as well as in the present line, but in a less advantageous place; inasmuch as the river Avon, near Warwick, is very considerably lower than at Wolston, where it is now crossed, and the Meriden ridge would have been intersected at a higher point than at present, besides the circumstance of these high and low points being much nearer together.

The line by the towns of Coventry, Daventry, Stoney Stratford, Leighton Buzzard, Berkhampstead, and Watford, may, therefore, be pronounced the very best the country would admit of, and an unobjectionable line for locomotive engines, having no rise greater than one foot in three hundred and thirty, or sixteen feet per mile, and this the opponents of the bill were no doubt perfectly aware of, as they never brought forward the direct line, or any other, as being better than that now executed.

The London and Birmingham Railway Act passed the Commons' Committee March the 15th, 1833, and the Lords, April the 22nd, 1833, receiving the Royal assent May the 6th; and the means which the directors were obliged to resort to must be left to the imagination of the reader; suffice it to say, that no variation sufficient to account for the different features of the case took place in the numerical value of the assenting or dissenting landowners, between the

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time of the first application being thrown out by the Lords' Committee and the time when the bill was passed by them.

Although there were found during the progress of this great work numerous and severe difficulties, there was nothing to indicate any thing like what was experienced, and without expending vast sums in boring, they could never have been anticipated. The district through which the line passes is peculiarly interesting in a geological point of view, and from the railway crossing the different strata at nearly right angles, it probably intersects a greater number of formations than any other line will do in the same distance.

The strata which are crossed extend from the London clay to the borders of the Coal Measures, and the various deep cuttings and tunnels shew most interesting sections of each formation. These have had considerable attractions for the geologists, and have been very numerously visited; they are now, however, becoming rapidly a sealed book, for as the various works successively approach completion, the sides of the excavations and embankments are either covered with turf, where it can be obtained, or where it cannot, with good soil, and sown with grass seed; this method of finishing the slopes being a great support to them through the tenacity of the roots.

The London clay is penetrated by the Primrose Hill Tunnel, and presents a close, compact, and dry appearance. This tunnel was perfectly free from water, but a more than usual thickness of brick lining was necessary, arising from an extraordinary pressure, probably caused by the swelling of the clay, on exposure to the atmosphere.

The plastic clay and sands were well shewn in the deep

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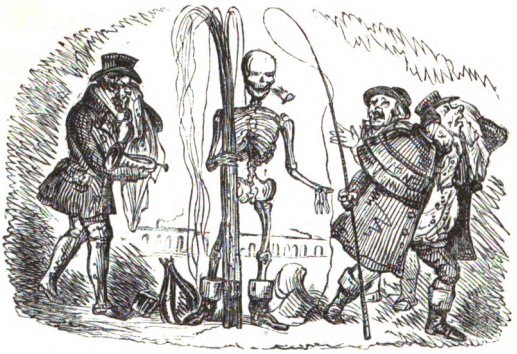
cuttings at the first summit from London, in the neighbourhood of Oxhey, before approaching Watford.

At Watford, near the Colne, the chalk first made its appearance underneath the plastic clay, and extended along the line to the Tring, or second summit, where a good section of the lower chalk is given by the deep cutting at that place.

The Watford and North-church Tunnels give also good sections,—the former of the upper chalk. A coating of gravel, varying in thickness, overlies the whole of the chalk, and in some instances forms the actual surface for arable purposes, and if we may judge from their very flourishing condition, this appears to agree well with turnips. The gravel is most abundant in the neighbourhood of Watford, covering the upper chalk which in many places it penetrates, or in other words, the large fissures or rents in the chalk are filled with the gravel, and as this latter material was very loose and mobile, it was the occasion of much difficulty and danger in the excavation of the Watford tunnel; for at times, when the miners thought they were excavating through solid chalk, they would in a moment break into loose gravel, which would run into the tunnel with the rapidity of water, unless the most prompt precautions were taken.



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W. Radclyffe

ENTRANCE TO THE LONDON & BIRMINGHAM RAILWAY STATION

EUSTON SQUARE, LONDON.

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W. Radclyffe

ENTRANCE TO THE LONDON & BIRMINGHAM RAILWAY STATION,

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KILSBY TUNNEL.

CHAPTER V.

THERE is little doubt that could our good forefathers of less than one century back return and take possession of their former homes, if indeed they could hope to find them again, we should some of us have a sorry chance of escaping with our lives. To talk of the age of miracles, indeed! of the penalties inflicted on the Galilean philosophy, and of the exploits of witchcraft,—what might we, their presumptuous descendants, expect when they saw us, like the giant-killer, in our seven-leagued boots—*videlicet* locomotives—taking forty strides for one; going just as far, and transacting just as much business, in a single day, as they were proud to put

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into a week.* How they would open their eyes in astonishment and dismay at witnessing the resistless proofs of our necromantic powers and triumph in all the black arts, such as they appear in one of our feeblest engines—a mere pony, as it is termed, velocipeding with the speed of ten racers, or the strength of one hundred of the stoutest of Barclay's drayers of porter. Indubitably, if our said ancestors could only catch us—rather difficult at their old rate of posting—we should be forthwith arraigned, tried, and, agreeably to the old laws,—however little so to ourselves,—not long since in force as regarded all sorcerers and dealers in forbidden knowledge, either hanged or drowned, or perhaps, for sake of variety, burnt, to eradicate our diabolical propensities of flying over the earth upon wings of fire; for they would assuredly not pay the slightest attention to our fine-spun theory of steam, or believe that any thing less than some supernatural, probably infernal, power, could contrive to send us, by a smoking, grumbling, little inanimate machine, at a pace so very different to the old plans of human motion on the surface of this our strange and antiquated earth.†

* The fact related in this note offers an extraordinary contrast with former times:—"A gentleman went to Liverpool in the morning, purchased, and took back with him to Manchester, 150 tons of cotton, which he sold, and afterwards obtained an offer for a similar quantity. He went again; and actually, that same evening, delivered the second quantity in Manchester, 'having travelled 120 miles in four separate journeys, and bought, sold, and delivered, 30 miles off, at two distinct deliveries, 300 tons of goods, in about 12 hours.' The occurrence is perfectly astounding; and, had it been hinted at fifty years ago, would have been deemed impossible."—*Railway Magazine.*

† The following comparison of speed would go far to justify our slow-motioned predecessors in ascribing the velocity produced by steam to Beelzebub, or some of his agents:—"The ordinary rate of a man per second, in walking, is four feet; of a good horse in harness, 12; of a rein-deer in a sledge on the ice, 26;

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In the compression of steam, producing results so happy and glorious,—propelling, or rather firing, us out of a steam-gun, as it were, at once to our destination, and then back again, with as much ease as playing at ball,—our wondering progenitors would have stoutly held there was a bottle-imp in the case, and would have had speedy recourse to exorcisms and holy water, instead of coke and spring water to calm the obstreperous effervescence of his powers. At all events, if we are to believe their own words, they would have been shocked at the idea of performing a journey from London to Birmingham, and back again to London, without making a will, or within less time than six days;—making their *last testament* on the Sunday previous,—setting out early on the Monday morning,—and, by possibility, getting home again in time to offer thanksgiving on the following Sunday, or sometimes late on the Saturday night; but this last was considered rather a rare feat,—most likely owing to some old

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of an English race-horse, 43; of a hare, 88; of a good sailing ship, 19; of the wind, 82; of sound, 1,038; of a twenty-four pounder cannon-ball, 1,800. A railway steamer, travelling at the ordinary rate of 30 miles an hour, performs 44 feet per second, which is eleven times the speed of the man walking, nearly four times that of the good horse, twice that of the rein-deer, and only about one-half less than the swiftness of the wind itself. But man, horse, and rein-deer, all become soon exhausted—even Boreas is sure to "crack his cheeks" before long; while the railway steamer is as fresh and strong at the end of a long journey as at first starting. Miles to it are but as paces to others. A racer, such as the Flying Childers, might possibly rival the steamer for the last half of a single mile heat; but we know a Fire Fly that would do more miles in one day than 360 Flying Childerses. Again,—a racer doing one mile in two minutes, and no more, can but carry a feather weight for that brief time and distance; while the steamer could draw the Grand Stand, and half the sporting world along with it, from Doncaster to Newmarket, and thence to the Hippodrome, in one day."—*Railway Times.*

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hunter, or wild young horse, having taken the bit in his mouth and started the whole concern *at a gentle trot.*

That this is no imaginary estimate of the power of locomotion possessed by our plodding forefathers something less than a hundred years ago, we shall have great pleasure in proving presently, to the no small credit of their business-like habits, especially of their adventurous spirit, their daring, and love of dispatch. It is even asserted, in some old chronicles, that expresses were known to have arrived in town from Birmingham early on the morning of the third day from that of their departure; and that on one occasion, when conveying intelligence to Government, a mounted jockey, by avoiding the high roads, and taking to the less knee-deep and sludgy fields, actually reached the capital on the second day, and earned a fame greater than any to be attained on the course.*

I was led into this train of gratifying reminiscences by observing a long train advancing at a very startling pace. It was an express sent to ascertain the cause of delay in the arrival of the regular afternoon train, which was beyond its time nearly an hour. It passed *me again on its return from Harrow* as I was walking upon the line between the tunnel at

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* "In 1703, when Prince George of Denmark went from Windsor to Petworth to meet Charles III. of Spain, it appears that the journey, which is a distance of about forty miles, occupied fourteen hours, although those who travelled it did not get out, save when they were *overturned* or stuck fast in the mire, until they reached their destination. "We were thrown but once, indeed, in going," says the relator; "but his Highness's body coach would have suffered very much if the nimble boors of Sussex had not frequently poised it, or supported it with their shoulders, from Godalming almost to Petworth. The last nine miles of the way cost us six hours to conquer them."—*Annals of Queen Anne.*

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Primrose-hill and Kilburn, having occupied just twenty-seven minutes and a half in going and returning—a distance altogether of twenty-one miles in the time that I had accomplished on foot just one and a half—being close upon the average of forty-six miles the hour.

On turning to my note book to set down this expeditionary fact, so little complimentary to a foot passenger, I was exceedingly amused to meet with the following entry, sent me a few days before by an antiquarian friend engaged in making out a scale of the locomotive progress of our active grandfathers. It is, word for word, an authentic advertisement, dated the 12th of April, 1742, and doubtless astonished the good people of that day by the splendid promises of dispatch which it held forth:—"The Litchfield and Birmingham stage coach set out this morning (Monday) from the Rose Inn, Holborn Bridge, London; and will be at the Angel, and the Hen and Chickens in the High Town, Birmingham, on *Wednesday next to Dinner*, and goes the same afternoon to Litchfield; it returns to Birmingham on Thursday morning to Breakfast, and gets to London on Saturday night, and so will continue every week regularly with a good coach and able horses."*

This fact in itself speaks volumes, especially when contrasted with the advertisements of the great modern Railway. It may be safely left to the reader himself to estimate *the distance* between ourselves and our ancestors, and measure how far, in regard to the science of locomotion, we are in advance.

The London and Birmingham Railway is 112½ miles long from the entrance at Euston-square to its termination; and

* Walker's Birmingham Paper, No. 26, 1742.

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passes through the counties of Middlesex, Hertford, Buckingham, Northampton, Worcester, and Warwick. Within one mile of the line are situated the city of Coventry, and the towns of Rugby, Fenny Stratford, Leighton Buzzard, Berkhampstead, Watford, and Harrow. The greatest inclination of the Railway is sixteen feet in a mile; excepting that part between Camden Town and Euston-square, about a mile in length, on which locomotives do not run, but a stationary engine with rope is employed to draw the train of carriages. This rope is upwards of 10,000 feet in length, and about seven inches in circumference; the two stationary engines and the rope cost £25,000, and draw the trains at the rate of twenty miles an hour.

The Grand Entrance is formed of a majestic Doric portico, similar to the Propylea of the Greek cities, with antæ and two lodges on either side, forming offices for booking parcels, &c. and extending about 300 feet in width, the centre being opposite to a wide opening into Euston-square. It was erected by Messrs. Cubitt, after the designs of Philip Hardwick, Esq., the successful architect of Goldsmith's Hall, City Club House, and other first-rate edifices. The proportions of this splendid erection are gigantic, and the portico may be considered the largest in Europe, if not in the world. The diameter of the columns is eight feet six inches; their height forty-two feet; the intercolumniation twenty-eight feet, forming the carriage entrance; and the total height, to the apex of the pediment, seventy-two feet. It is built of Bramley Fall stone; of which, in this erection alone, above 75,000 cubic feet were consumed. It may astonish some readers to know that several of the blocks of stone weighed about thirteen

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tons; and that the erection of this front and the wings cost £35,000.

The regulations respecting the different entrances are excellently contrived, so as to prevent even the possibility of confusion. Gates for ingress and egress are perfectly distinct; and by the simple rule of adhering to the plan in use on the high roads, of keeping the left hand uniformly, the chances of accident or collision are very materially diminished. Thus passengers enter on the left of the entrance at Euston-square, while those from the country emerge by the right; and on each side are the numerous offices prepared for the convenience and accommodation of the different classes. Passing through the booking offices, the passenger enters an extensive yard, covered with a beautifully constructed and elegant iron roof, supported on iron columns, under which the carriages are placed on their arrival and departure. This shed is 200 feet long and about 50 span, and at night is brilliantly lighted with gas. Even when it happens that a train arrives from the country just as another is leaving town, and when hundreds of persons are enclosed in the area under the shed, all is regularity and facility for departure. An effective police and numerous assistants, in the uniform of the Company, ensure every precaution that can be taken, both as regards the safety of the public and the care of property.

One mile of the Railway, between Euston Grove and Camden Town, has four lines of rails, and the remainder two. The rails at depôts, sidings, stations, &c. may be estimated at one tenth of the whole length, making a total extent of double line of rails laid down upwards of 124 miles. They are manufactured of the best malleable iron, and are of

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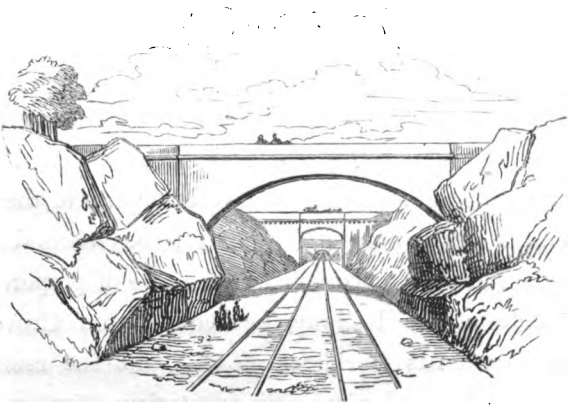
different thickness and form. Some parts have rails which are called, from their increasing in thickness towards the middle, fishbellied, and weigh about 50 lbs. to the yard; while others are parallel, weighing 65 lbs. to the yard, and some as heavy as 75 lbs. The rails are supported by what are called *chairs*, fastened to stone blocks or wooden sleepers, carefully fixed in the ground so as to elevate the rail more than an inch above it. The stone blocks for the whole line may be estimated at 152,460 tons, and their cost at £180,000.; the expense being pretty nearly divided into three parts—viz., one-third for the cost of stone, one-third for freight to the Thames, and the remainder for delivery on various parts of the works. The weight of iron rails used for the whole line is truly astonishing, being nearly 35,000 tons, which cost the Company about £460,000.



EXCAVATION NEAR COVENTRY.

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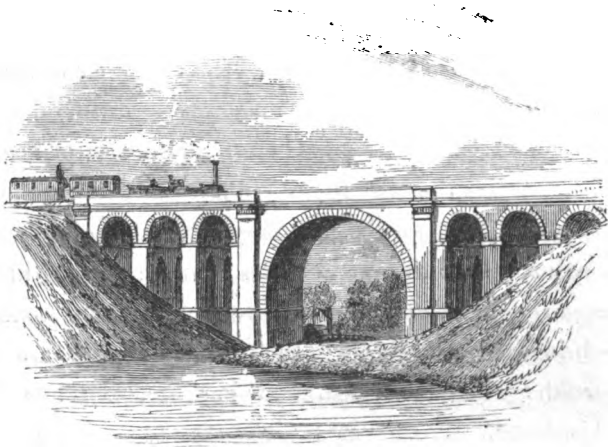

SHERBORNE VIADUCT NEAR COVENTRY.

CHAPTER VI.

From Euston Square to Camden Town the Railway is formed by a wide cutting or trench, about eighteen or twenty feet deep, the sides of which are composed of beautifully executed brick work, having an iron balustrade at top, which, when the trees and shrubs of the adjoining gardens have sprung up, will form a pleasing object. The land being on a considerable rise outwards from London is worked, as before named, by endless ropes passing over pulleys in the middle of the tracks, which ropes are set in motion by the

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stationary steam-engines at Camden Town. Great precaution is required in attaching the carriages to the rope; and this is generally done by one man, who is trained for that purpose. The way in which he effects the fastening is by means of a small rope, called a *messenger*, having a slip knot at one end, which he passes over the rope, and holds the other in his hand as he stands on the foremost carriage, in order to release the train when it reaches Camden Town, or in case of accident. By a signal given to the engineer, the engines are stopped in an instant. The train is generally drawn up this length of railway in three or four minutes, during which time the passenger passes under several very handsome stone and iron bridges and galleries; the most extensive are those under the Hampstead-road and Park-street. The whole of this length is excavated from the London clay; and the walls which form the sides are curved, in order to resist the inward pressure; they are as much as three bricks thick at the top and seven at the bottom; the number of bricks used in forming these gigantic walls was about sixteen millions. When the train arrives at the Iron Bridge which carries the line over the Regent's Canal, the carriages are detached from the rope, and allowed to run along the line till they meet the locomotive engine by which it is afterwards propelled.

The impression on the eye, and much more on the mind, on approaching the works by the Grand Entrance, through a spacious area—the first view of the road—the vast preparations—and the splendid train of carriages, presently sweeping along with the velocity of the wind—is described by almost every stranger as at once exciting and magnificent. When it

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is considered that the mighty impulse which bears hundreds of human beings at the speed of from twenty to forty miles in an hour, is given without a breath of animated life—that not one effort is made except by blind inanimate matter, rushing over the land at the mere dictum of its master mind —the effect of the whole is indescribably strange and impressive, and calculated to raise a new train of thought and reflection.

Rapidly traversing the Grand Excavation, we soon reach the Camden Town Station, and have in view the open country, and the green and diversified hill of Highgate. In travelling thus far we have passed under seven bridges, two of considerable magnitude,—one being 484, and the other 380, feet in length. The elegant suspension bridge which is slung over the Regent's Canal cost £4,500.; it is divided in the middle by one of the main girders to which the Railway is suspended.

The CAMDEN TOWN DEPÔT forms a Station for the carrying department of goods, while that at Euston-square is set apart for passengers. The former contains thirty-three acres of land, which are raised several feet above the regular surface of the ground, and supported by a wall; so that heavy goods may be easily lowered from the railway waggons into carts to be conveyed to their destination. At this Station is a very extensive locomotive engine house, which cost £21,000.; several ovens for making coke for the use of the engines; a repository for cattle brought by the railway to supply the London market; stabling for fifty horses; a manufactory for carriages; and offices for a large establishment of clerks, and of the Engineer in Chief and

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the Resident Engineer.* Here, also, are the stationary engines for working the ropes, but they are under ground, immediately below the Railway; their situation is marked by two very elegant chimneys, which belong to the boilers; these rise to an height of 133 feet above the rails, and are twelve feet diameter at bottom and six at the top. In the engine house is an organ-pipe or whistle, which communicates with the passenger station at Euston-square by a tube, along which a signal can be conveyed to the Engineer in four seconds. The way in which the signal is now given to start the engines, is by an apparatus similar to a gasometer; it consists of a weighted cylinder, which dips into another cylinder filled with water. On allowing the upper or inner cylinder to descend, the air which it contains is forced down an upright pipe in the inside of it, and passes along a pipe under ground; then as it rushes out at its other end through the whistle, the signal is given to start the engines.

Immediately the locomotive engine is attached to the train it starts forward towards Birmingham. Passing under the bridge which carries Chalk Farm Lane over the Railway, the passenger arrives at an excavation leading to Primrose-hill Tunnel, which he enters at a depth of forty-five feet below the surface. This tunnel has a remarkably handsome stone front, erected from the designs of Mr. Budden;† in length

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* Mr. Fox, the Resident Engineer at this end of the Line, had under his charge the important contracts between Euston-square and Primrose-hill Tunnel. In the superintendence of these works he evinced indefatigable industry, and a thorough acquaintance with his profession.

† A gentleman who has acted as Mr. Robert Stephenson's secretary.

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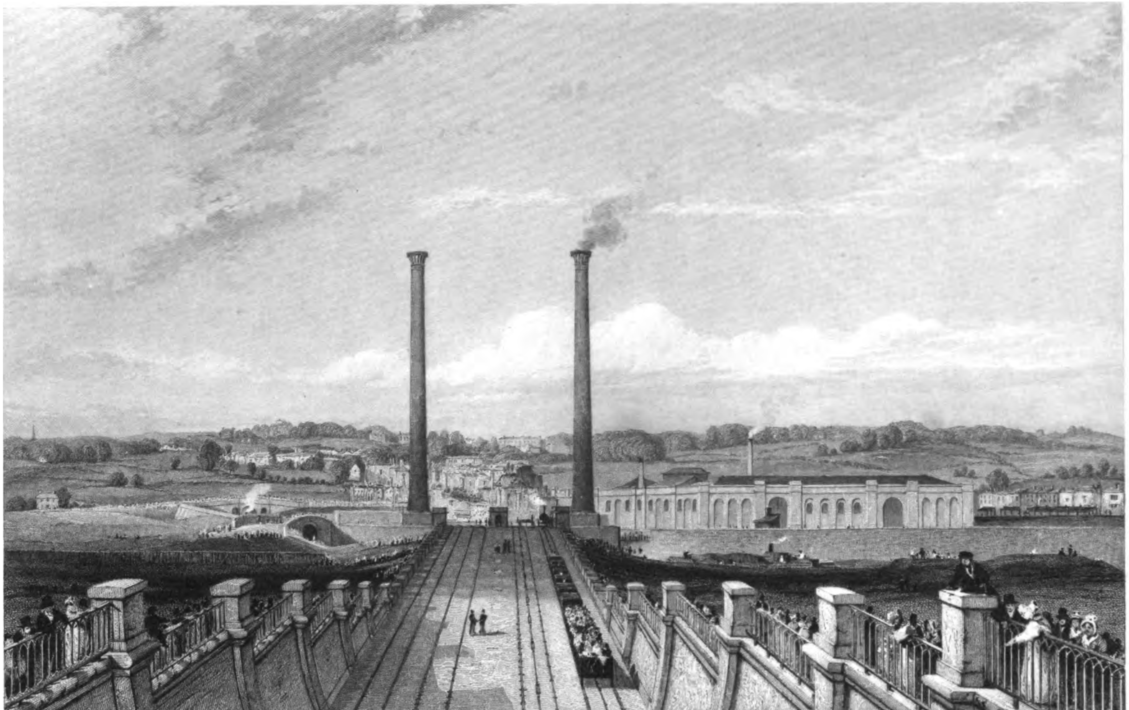

Drawn by E. Duncan. Engraved by H. Griffiths

THE EXCAVATION NEAR CAMDEN TOWN,

With the Stationary Engine Chimneys &c. seen from the Frame House.

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it is more than 1100 yards, and in height and width each twenty-two feet; being ventilated by a shaft eight feet in diameter, which rises fifty feet before it reaches the summit. In the construction of this tunnel the work is three bricks thick, and there were eight millions consumed in its formation.

After clearing the tunnel and excavation, the traveller, on reaching the levels, almost universally experiences a sensation of freedom and elasticity, like to that which the pilgrim feels when he has surmounted the heights that have long engaged his toiling steps. Such, however, is the rapidity of movement that little time is allowed for any feeling but that of a pleasant kind—for the eye quickly glances over innumerable objects, instinctively seeking and resting where, as the poet aptly expresses it,

"Distance lends enchantment to the view."

The village of Hampstead attracts our notice on the right while we rapidly glide forwards; and at less than four miles from the metropolis we reach Kilburn, situated on the Watling-street of the Romans, but of late more celebrated for its retired gentility, the splendid residences in its neighbourhood, and pleasant air, than for its former antiquities. On the road between Kilburn and a neighbouring village called Kingsbury, Oliver Goldsmith for some time resided, having chosen this spot on account of its retirement, yet proximity to the metropolis. Here he prepared portions of his "History of the Earth and Animated Nature," and wrote the "Vicar of Wakefield." It is narrated that on one occasion Mickle, the translator of the Lusiad, accompanied by Boswell, went to visit Goldsmith, but he was not at home.

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Boswell, in his life of Dr. Johnson, in reference to this visit, says—" Having a curiosity to see his apartment we went in, and found curious scraps of descriptions of animals scrawled upon the walls with a black-lead pencil." At Kilburn, the road from London to Edgeware is formed over the Railway by a remarkably elegant bridge of the Grecian Doric order.

Pursuing our course, we are again hid from the light of day in passing through another tunnel, which, however, is only about 420 yards in length; and presently the Brent valley embankment commences, rising in some parts from thirty to thirty-five feet above the adjoining land, from which are pleasing views of the surrounding picturesque and luxuriant scenery, including the town of Harrow, seated on the highest hill in the county, in the distance. In its construction, 102,000 cubic yards of earth were used; and the river Brent flows beneath it, through a handsome brick bridge of sixty feet span, with land arches on either side, being nearly forty feet above the level of the stream.

Rapidly gliding over an embankment about nine miles from town there is a nearer view of Harrow-on-the-Hill, with its picturesque church and spire enveloped in foliage; and still farther on, about a mile from the embankment, this beautiful locality discloses itself in all its picturesque combinations. No less famed in the annals of scholastic lore, and discipline too, its spacious, rambling building brings to mind the names of some of the greatest men who have adorned the political, ecclesiastical, and literary annals of England. The school is under the control of a Body Corporate, who have also the management of the estates left by its founder, one John Lyon, a farmer of the parish,

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who died in 1592; four exhibitions of £20., and two scholarships of fifty guineas each, are connected with the school. The greater number of pupils, amounting to upwards of two hundred and fifty, are not on the foundation.

From the hill are prospects of surpassing interest and loveliness. To the west and south-west is beheld a vast extent of country, including the Royal Castle of Windsor, and portions of the adjoining counties; northward, the districts about Stanmore and Bentley Priory, the seat of the Marquis of Abercorn. To the south a still richer country, though less varied with pleasing objects, stretches far away to the Surrey Hills; and eastward the view comprises Hampstead, Highgate, and the metropolis.

Harrow Church is of great antiquity, having been built before the Norman Conquest, but it was not consecrated until 1093. Eadmer, the historian, narrates that Archbishop Anselm in preparing to consecrate the church, as being on his own manor, was opposed by the Bishop of London, who claimed the right of dedication to himself. The dispute was referred to the Bishop of Worcester, the only Saxon prelate then living, who decided in favour of the Archbishop. It was partly rebuilt in the fourteenth century, but still retains many traces of its Saxon origin, particularly in the circular columns which separate the aisles from the nave.* Above the nave are several clerestory windows; and at the west end is a square embattled tower, with graduated buttresses, from which rises the fine old steeple, which, it has been remarked,

* When some divines were disputing before King Charles II. about the *visible church*, his Majesty said that he "knew not where it was to be found, except, indeed, at Harrow."

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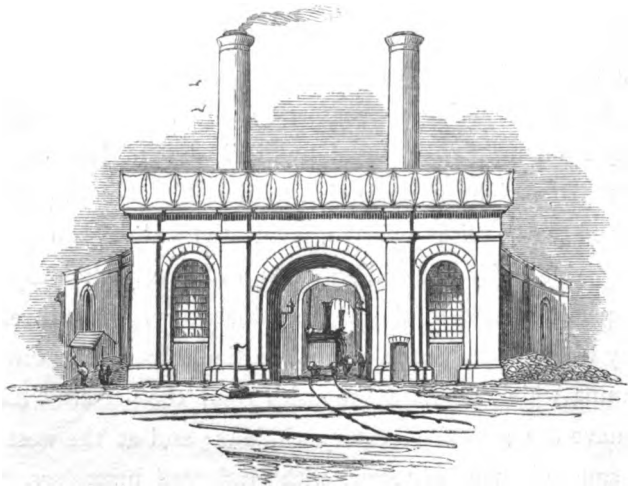
perhaps attracts more frequently the notice of the traveller than any similar building in the kingdom.

There are but few remains of its once magnificent palace, one of the archiepiscopal seats of several succeeding Archbishops of Canterbury, and afterwards of Lord North. It is believed that the manor of Harrow was in the possession of the church at a very early period. In Doomsday Book it is said to be held by Archbishop Lanfranc, and was for many ages the occasional residence of the archbishops,—among whom may be named Thomas à Becket, in the year 1170; Boniface, in 1250; and Winchelsey, in 1300. It was exchanged for other estates in 1543, by Cranmer, to Henry VIII., who granted it to Lord North.



CAMDEN TOWN ENGINE HOUSE.

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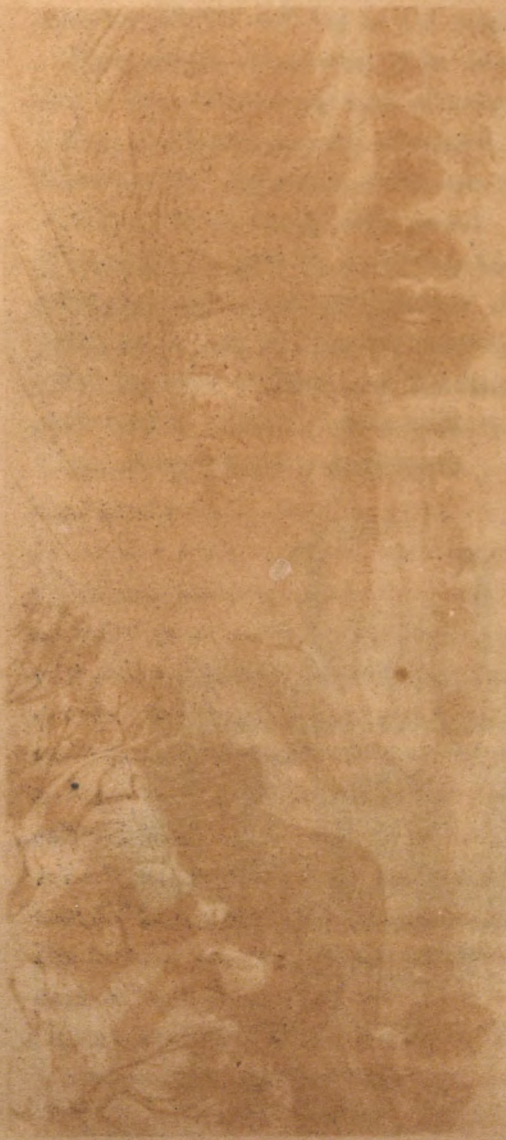

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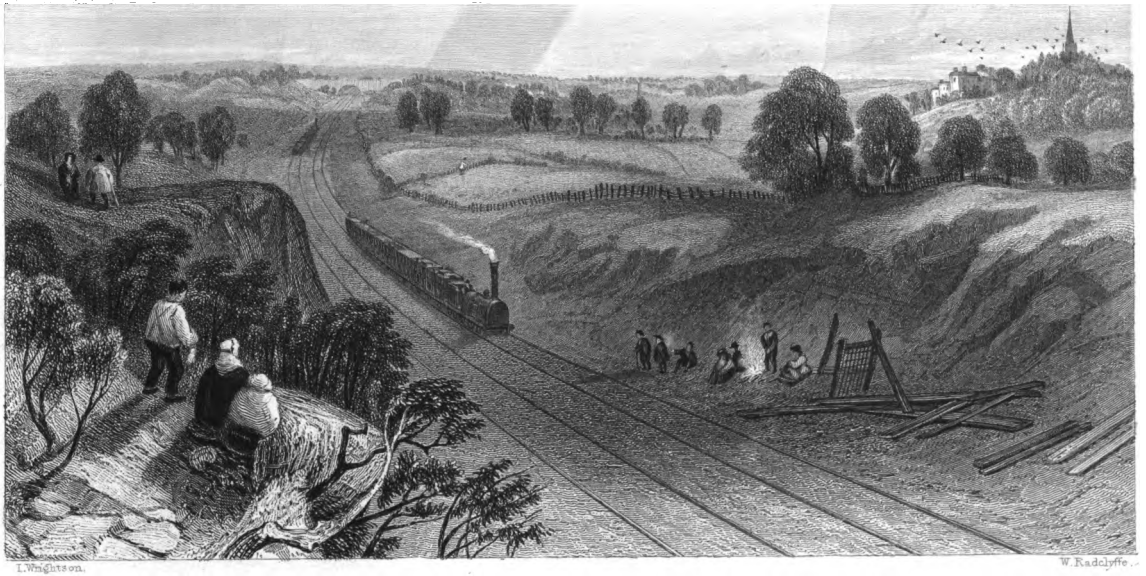

I. Wrightson.

W. Radclyffe.

HARROW ON THE HILL.

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EMBANKMENT AT DUDDESTON.

CHAPTER VII.

At about eleven and a half miles from the Euston Station, and immediately on the other side of the bridge which carries the road from Harrow to Harrow Weald over the Railway, we reach the Harrow Station, being the first from London. It might be well here to notice, that the stations are classified into two kinds: the first class and mail trains stopping for passengers only at certain stations, called *principal stations;* whilst the second class, or mixed trains, take up

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and set down passengers at *all the stations.* This arrangement is common to all the railways yet open to the public, and affords those who require expeditious travelling to make choice of the particular train which will convey them soonest to their destination; whilst those who merely propose to view the surrounding country, and those to whom economy is an object, will perhaps choose a second class train for their trip.

The Harrow Station is a neat brick building, with an enclosure in front, where passengers who intend to go by the next train may walk about at leisure, after booking their places; or, should they prefer to repose themselves within doors, commodious waiting rooms are provided. A similar arrangement is observed here, as well as throughout the whole of the line, in order to prevent confusion amongst passengers, arriving or departing; as separate entrances are provided for each class of passengers, and the utmost order and regularity prevails, even if there be a number of persons going to and from the stations at the same moment.

We may, in the course of this work, digress a little upon the effects which this new system of travelling will produce; but we do not propose to stop here, further than to notice that the whole code of laws regulating the immense machinery of the passenger traffic of this vast undertaking, may be said to have emanated from Ashlin Bagster, Esq., a gentleman who holds the appointment of agent to the Company for this department of traffic; and under whose management we have no doubt, from his talents and the experience he possesses in such undertakings, the most beneficial results will accrue to the shareholders of the concern; whilst the

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public will have every reason to find that their comfort and safety have been alike provided for.

About two miles further on the line we enter the excavation through the first ridge which this Railway crosses; it varies from thirty to forty feet deep, and is composed of plastic clay and sand, which appears in some parts to be very loose. There are two or three bridges in this cutting which present a bold appearance, and are exceedingly elegant in their proportions; that, for instance, which conveys Oxhey-lane over the Railway, is formed of three fine segmental arches, the centre one springing from two very lofty piers at an elevation of twenty-five feet, and the two side arches abutting upon the slopes of the excavation; the parapets are about thirty-five feet above the level of the Railway, and the whole is composed of brickwork of a very superior description. The trains as they pass through this bridge present a remarkably picturesque object. It was originally intended to have had a short tunnel through this ridge, but the soil was found of such a nature that a saving of expense was effected in adopting an open cutting. From the summit of the ridge a most extensive and delightful view is obtained of the surrounding country, more especially in the direction of Watford and the valley of the Colne, in which the course of the Railway may be traced for several miles in advance, and being on a curve, the trains are seen winding along for some time before they approach this spot. The soil taken from this excavation amounted to about 372,000 cubic yards, and was conveyed partly to a spoil bank, and partly to form an embankment towards the town of Watford, of about three quarters of a mile long. At the end of the embankment

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we arrive at another excavation of considerable magnitude, crossed by several lofty bridges similar to that last described, and being in some places upwards of forty feet deep, out of which half a million cubic yards of earth were taken.

Here the first appearance of the chalk formation is seen; and being mixed with flint and gravel was found highly advantageous in forming the road. This soil was conveyed to and partly formed the embankment which passes by the town of Watford, and carries the Railway across the Colne valley. It took nearly one million cubic yards of earth to make this embankment, which is in some places above forty feet in height, and is the largest throughout the whole line. Soon after entering upon it the Railway goes over the London road, by a brick viaduct of five arches, of forty-three feet span each; they are composed of ellipses, having voussoirs at the intrados; the centre arch is of an oblique form, in order that the course of the road should be preserved as heretofore. This may be thought a bad feature in a design of this kind, but it was unavoidable, the trustees having compulsory clauses in the Act of Parliament to compel the Company to adopt this form of arch. The manner in which the engineer has overcome the defect in the design is admirable, and it is scarcely perceptible to the observer: it is a very massive structure, and cost in its erection £9,700. The other arches are square with the line of Railway; and at either end are retaining walls built into the embankment, making the total length of the viaduct three hundred and seventy feet.

The next bridge conveys the Railway over the river Colne. It consists of five semicircular brick arches, of thirty feet

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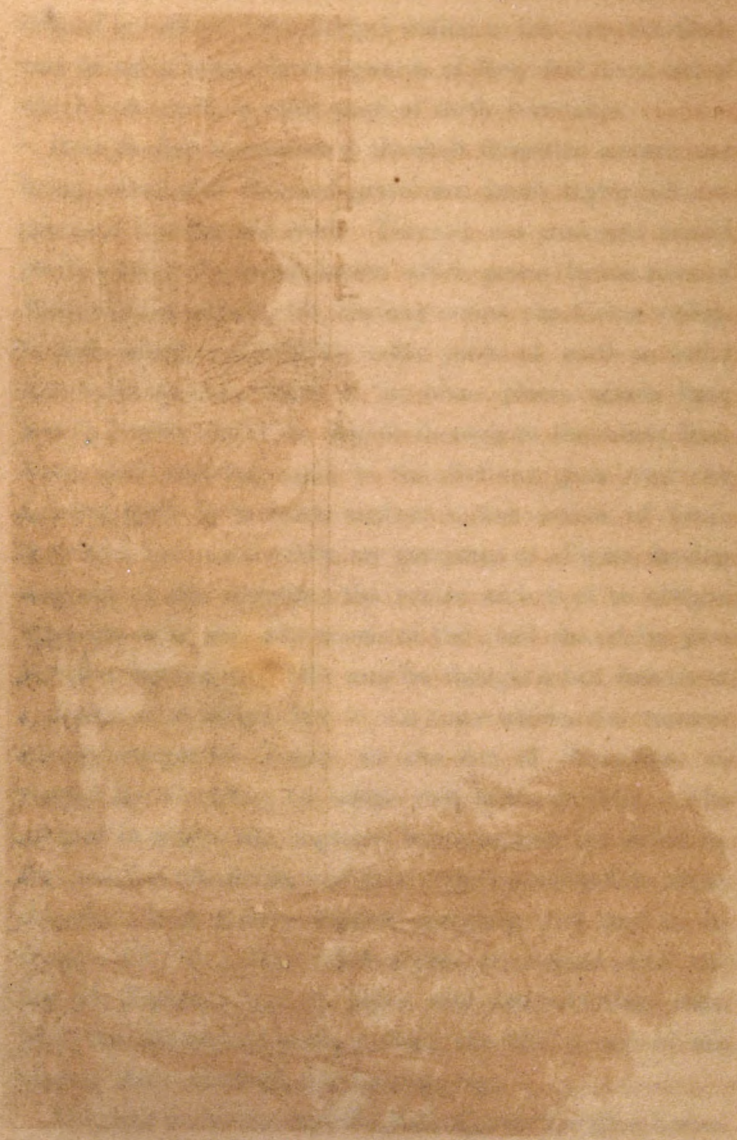

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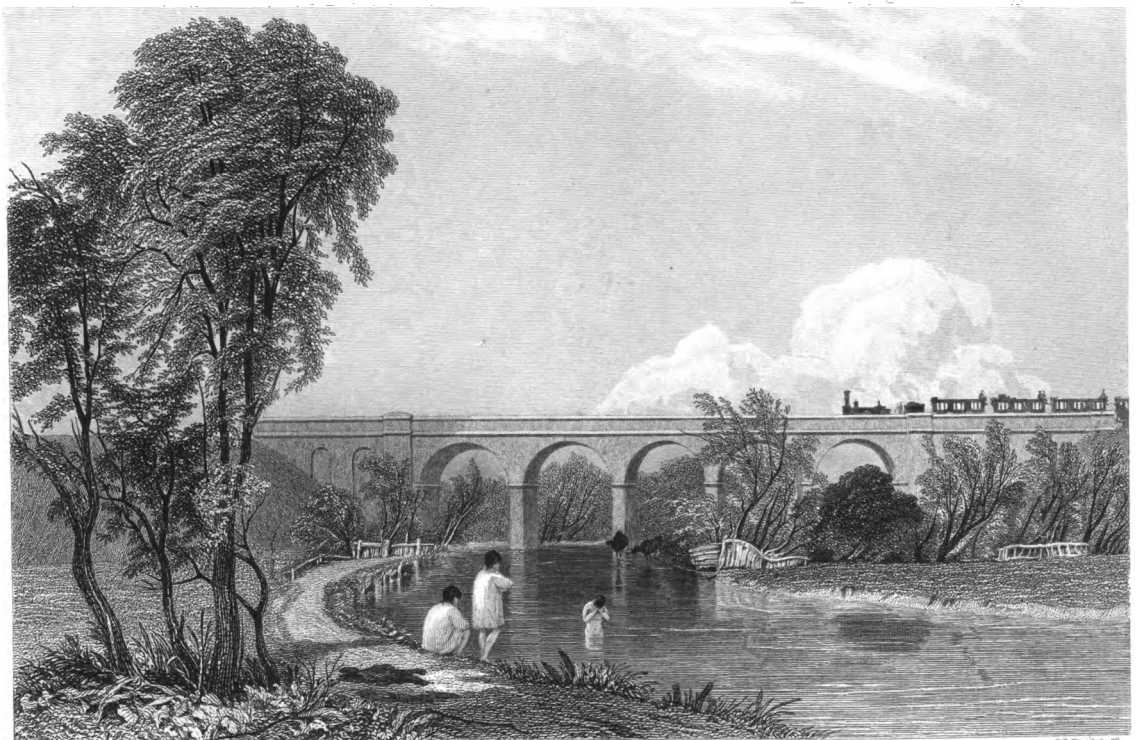

G.Dodgson. W.Radclyffe.

VIADUCT OVER THE RIVER COLNE,

near Watford.

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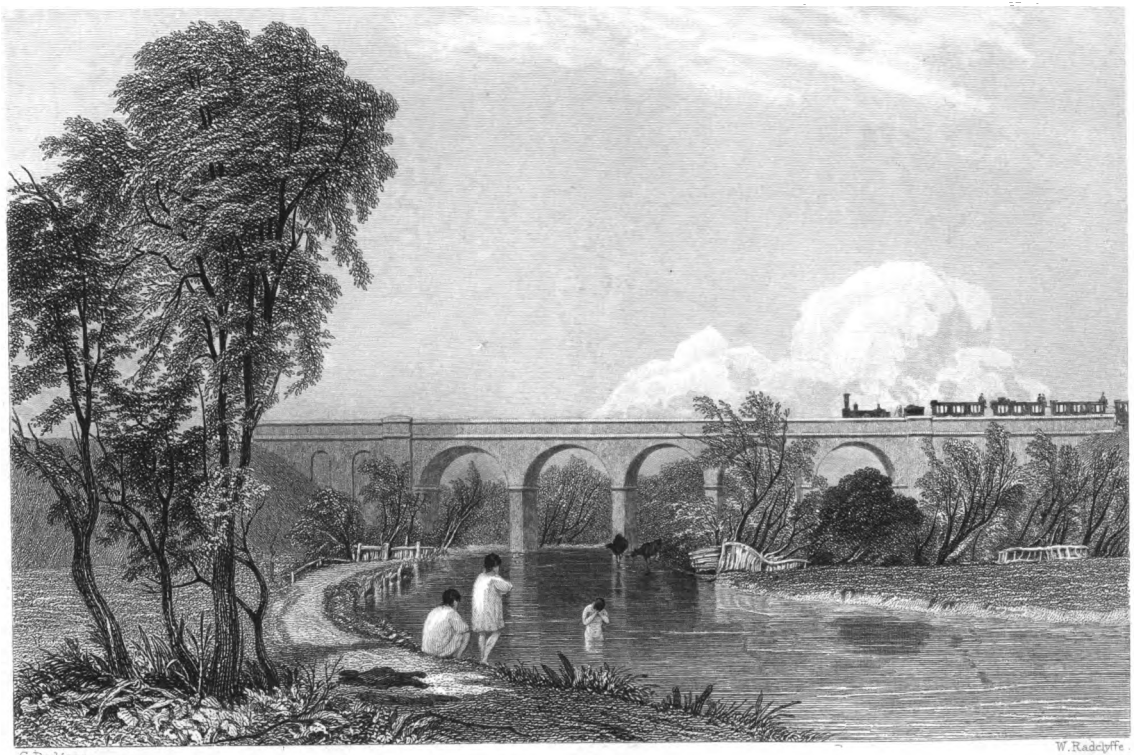

G. Dodgson. W. Radclyffe.

VIADUCT OVER THE RIVER COLNE,

near Watford.

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span each, with side walls, and having a stone cornice its whole length,—the total length of the parapet walls being 312 feet. It has a light appearance; and viewed from the meadows appears very lofty, being fifty feet high. The construction of this bridge was a work of considerable skill and labour, the foundations being of the loosest material possible; in fact, it may almost be called a floating bridge —for it rests entirely on platforms of wood, having sheet piling to protect them. The cost of its construction was little less than £10,000. The whole of the land near this spot is most precarious in stability; and the effects are clearly visible in the amazing "slips" which have taken place in the embankment across the valley. Oftentimes, in a very few hours, the level of the newly-formed ground has sunk several feet, while the base of the embankment has widened out to an enormous extent, causing infinite labour to bring the level of the Railway back again to its original state, and to make it solid enough for the passage of the trains; this has caused many a sleepless night to the workmen and engineers. The length of this embankment is about a mile and a half, and is composed entirely of the finest materials for such a purpose—chalk and gravel.

On arriving at a very elegant skew bridge, which carries the road from Watford to St. Albans over the Railway, and at about seventeen miles and a half from London, we enter the WATFORD STATION; and here, as we before observed, every arrangement is made for the comfort and convenience of passengers. The first and second class waiting rooms are very commodious, and so is the departure yard, which is sheltered from rain by an elegant corrugated iron roof. This is the

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first principal station, and where the engineers supply their tenders with water after leaving London; for which purpose a ten-horse steam engine is provided with suitable pumps and machinery. There is also an engine house for locomotives, and a carriage shed; in fact, the arrangements of the whole are of the most perfect description, and no expense appears to have been spared in their construction.

The town of Watford is pleasantly situated above the banks of the river Colne, and is of considerable antiquity. In 1455 the army of Henry VI. was quartered here previous to the battle of St. Alban's. The spirit of improvement which is the characteristic of our countrymen, and that vast field of speculation which these mighty undertakings are calculated to open out, is here strikingly exhibited in the erection of buildings which are springing up on all sides since the Railway has been opened; and no doubt in a few years the town of Watford will have a mile of length added to its thickly inhabited streets.

At a short distance beyond Watford, the Railway runs parallel with, and near to, the Grand Junction Canal, as far as Fenny Stratford. There is one feature which strikingly distinguishes the construction of railways from that of canals; and this is, the employment of the surrounding agricultural population. When the reader is informed that, for nearly three years, from fifteen to twenty thousand men were engaged on this work, taken almost invariably from the adjacent towns and villages,—and that, in actual labour, nearly four millions have been expended among the local population,—he will have some idea how this would influence pauperism and the poor rates; whereas, in the making of

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canals, it was the general custom to employ gangs of hands, who travelled from one place to another, and did nothing else. These banditti, known in some parts of England by the name of "Navies," or "Navigators," and in others by that of "Bankers," were generally the terror of the surrounding country; and are as complete a class by themselves as the gipsies. Possessed of all the daring recklessness of the smuggler, without any of his redeeming qualities, their ferocious behaviour can only be equalled by the brutality of their language. It may be truly said, their hand is against every man, and, before they have been long located, every man's hand is against them. From being long known to each other, they in general act in concert, and put at defiance any local constabulary force; consequently, crimes of the most atrocious character were common,—and robbery, without an attempt at concealment, was an every-day occurrence: but they were so thinly scattered over the London and Birmingham Railway, that their depredations partook generally of a deceptive character, and acts of open violence were rare.

These deceptions were sometimes not a little amusing; as, for instance, the following:—a navigator, engaged on one of the contracts went into a village public-house, and made the inquiry—"Have *you* got any gin?" laying a great stress on the word *you*. The landlord quickly responded that he had plenty. "Oh," said the navigator, "I am glad of that! I have been to the other public-house, and broke *him* of all he had. I wanted two gallons, and he had only got one; so I have had to come here for the other one." The gallon was quickly measured out, and added to that which he had before in his bottle. He was then very coolly walking out of the

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shop: mine host, however, soon reminded him that there was a little process to go through which appeared to have escaped his recollection,—namely, the paying for the gin. To this the "Navie" shrugged up his shoulders, and said he would pay on Saturday night. Boniface thought he would not be cheated in this way; and the gallon measure was quickly refilled again out of the "Navie's" bottle; when he departed, looking very indignant at not being trusted till his pay night. It only remains to say, that what he had originally in the bottle was a gallon of water,—not a gallon of gin,—and consequently his ingenuity was rewarded by his getting clear off with half a gallon of "mine host's best cream of the valley," in a state conveniently prepared for drinking.

The excavation which follows after quitting the Watford Station is one of considerable magnitude, and leads us to the tunnel which passes under the second great ridge between London and Birmingham. The chalk formation still continues along this distance, intermixed with the finest quality of gravel and some flints.

The entrance of the Watford Tunnel is composed of an arch, nearly semicircular, twenty-five feet high and twenty-four feet wide, with retaining walls on either side, extending to the slopes of the cutting; a blocking and cornice runs through the whole length of the front, and the arch is surmounted by a pediment. The Tunnel is one mile and a tenth in length, and is excavated entirely from chalk and loose gravel, the treacherous nature of which rendered it a work of great difficulty. It was first formed by sinking six shafts to a certain depth, and then excavated horizontally in what is called by miners a "drift," which is a small aperture, just

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large enough to admit a man to walk in. The use of these drifts are, that greater accuracy in setting out the line is obtained, through which a communication is formed to the several working shafts, as also a free ventilation of air for the men during the progress of their work, which in many instances had to be conveyed down to them by side shafts. An idea may be formed of the treacherous nature of this soil, when it is known that a certain part of the tunnel was found to consist of such firm and solid material, that the invert, which supports the upper structure of the brick arch and sides, was not introduced, but that the side walls rest upon the chalk; yet other parts were so mixed with gravel and sand, that, when in the course of the operation a fissure was made, a stream of it poured in like water.

In passing through the tunnel, and near the centre, travellers will not fail to observe a wide opening or shaft: this was formed through an unfortunate accident which occurred here during the formation of the tunnel. At this spot one of the six working shafts was sunk, of about eight or nine feet diameter, and it had been nearly finished, when the whole mass of soil surrounding it gave way, completely burying ten men who were at work below. They were engaged in fixing one of the iron rings, which are built into the top of the tunnel to support the brickwork of the shaft; and from all that could be learned by observation,—for not one was spared to tell the tale,—it appeared that one of the men had cut away some of the chalk to obtain more room to fix the iron-work, and by so doing had penetrated so near the gravel that it broke through in an instant, and entirely filled up the space, leaving them not a moment's time to save themselves.

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So instantaneous was the accident, that one poor fellow was found, three weeks afterwards, standing perfectly upright, with his trowel in his hand. It was nearly a month before the soil that had given way around the shaft could be cleared out; when the opening was found to be so extensive, and the material so loose, that the idea of making a large ventilating shaft at once occurred, and it was immediately executed.

The other end of the Tunnel has a similar entrance to that last described; and the excavation, varying from fifty to sixty feet deep, is through the same sort of material. Emerging at length from the Tunnel, we traverse an embankment nearly three miles long, and between thirty and forty feet high, which contains an exceedingly elegant iron bridge, passing obliquely over the Grand Junction Canal, at an elevation of thirty feet. This structure consists of six main ribs, being segments of circles of sixty-six feet span, with cross bracings and covering plates, the abutments and retaining walls being composed of brick. On the top of four of the ribs the rails are fixed, and the whole is surmounted with a very neat iron railing of chaste design. The appearance of this bridge from below is very interesting as its construction can be well understood, and presents an appearance of great strength and firmness.

Mr. Stephenson originally projected the Railway considerably more to the west of the present line, by which the Watford tunnel would have been entirely avoided, and a considerable saving in the cost of this portion of the line effected; but the very powerful opposition which the Earl of Essex (whose park is not far distant,) gave to this plan, compelled the projectors of the Railway to acquiesce in the present course, and to submit to a much heavier expenditure.

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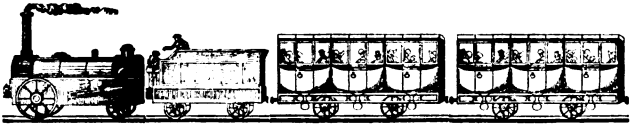
It affords an interesting scope for reflection to make a retrospect of the first beginnings of an undertaking of such magnitude as this Railway, which has cost five millions of money. In 1830 there was to be one line of rails only, and the work was to be finished for £6,000. per mile. The capital was then one million and a quarter; and no greater velocity contemplated than eight miles an hour. Shares got up to nine and ten premium on the above prospectus, at which many hundreds were sold. Then it was determined to have two lines; and at that announcement the shares directly fell to a discount. In 1831 the proposal was for four lines; and the capital was £3,081,642., with a proviso that the land, although taken at £300. an acre, was not so high as that required for the Liverpool and Manchester Line, through the enormous and unreasonable sums required by some proprietors beyond the real value of the land. We wonder what the speculators of those days would have thought, if they could then have been informed what the real cost of the present two lines would be. One thing is certain, there would not have been a railway between London and Birmingham for many a year.



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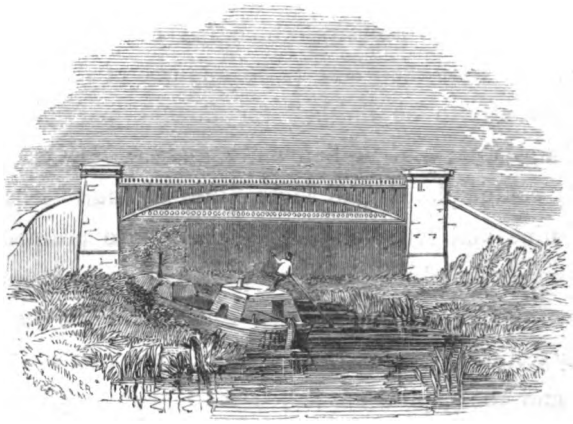

BRIDGE OVER CANAL AT LONG BUCKBY.

CHAPTER VIII.

"THOSE who investigate the history of the human race,—who trace their slow and gradual progress from their lowest and most abject to their highest and most polished state,—will find that it has always been accompanied, and chiefly promoted, by the invention and improvement of tools and engines." *

There can be no doubt of the truth of this remark. How grateful ought the world, then, to feel to the scientific genius of England, for the untiring perseverance with which she has pursued her way in the process of discovery, from the steam-kettle of Savary to the powerful steam-engine of

* Edinburgh Review, No. 112.

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G.Dodgson. E.Radclyffe

VIEW ON THE LONDON & BIRMINGHAM RAILWAY,

Looking from the Hill above Box Moor Station towards Berkhamstead.

To George Carr Glynn Esq. this plate is inscribed.

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Watt; and, most of all, for the ingenious application of this stupendous power to the purposes of locomotion. Independent of the thousand objects of utility which it accomplishes, —its direct administration of the law of force,—its economical apportionment of time and labour,—the pleasure alone, the mere delight, of a trip through the very heart of England, at the rate of from thirty to forty miles the hour, is really a glorious thing. What would Doctor Johnson have given, to whom rapid travelling was one of the sublimest sensations he could conceive of, for a nine hours' fly from London to Liverpool? Assuredly, he would not have thought the fares of the London and Birmingham,—even the conveyance of the mails,—too great a tax upon the public; nor the prospect less delightful than his favourite one of a vast crowd,—one floating mass of hats,—from the bottom of Fleet-street to the top of Ludgate-hill. How we wish the leviathan of literature could have lived to see the leviathan of science; and been introduced to one of Stephenson's *first rates*, bounding along with all the ease and agility of the best trained race-horse.

Having passed the pretty village called King's Langley, pleasantly situated on the side of a hill close to the Railway, we enter an extensive cutting of nearly two miles long, and occasionally upwards of forty feet deep; the material taken from which was conveyed principally to the embankment over Box Moor Valley.

At the end of this excavation, and at about twenty-four miles and a half from London, we arrive at the Box Moor Station; which, as the Railway is here on an embankment, is two stories high; so that the waiting rooms and departure

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yard are on the level of the Railway, while the booking office is below. It was to this Station that the first portion of the Railway, from London towards Birmingham, was opened to the public. The auspicious event was celebrated by an invitation from the directors to their friends to amuse themselves by taking excursions on the line; and on the last occasion of these pleasant trips nearly 600 persons went in the carriages in one train. On the ground which rises abruptly to the west of the Station, and near a clump of fine fir trees, a large marquee was fixed, in which every refreshment that could be desired was supplied in abundance. Near this spot Mr. Dodgson has taken his beautiful view of the Railway, towards Berkhampstead.

The name of Box Moor would lead a person unacquainted with the country to suppose it was a wild, barren spot: such, however, is not the case; for it presents, from the point where the view in the plate is taken, a finely cultivated and fertile valley; and the course of the turnpike road and canal, which run parallel to the Railway through its whole length, gives it a very picturesque appearance. Within a few yards of the Station, the Railway crosses by a bridge of one arch over the London road, at an angle of thirty-two degrees. This bridge will amply repay the engineer, or man of science, for the trouble of a personal inspection; and we will endeavour to describe it to such of our readers as are unable to visit it.

The science of bridge building has, of late years, made rapid strides towards perfection, and there are many instances where arches of immense span have been erected; but we believe no example exists of such an oblique arch executed in brick-work as that now under notice. The square span

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across the road is twenty-one feet; but the obliquity causes the span on the face of the arch to be lengthened to more than thirty-nine feet: its facial form is that of a flat segment of a circle; and the acute angle of the quoins is chamfered off until it reaches the obtuse angle, where it vanishes. This gives the bridge the appearance of having one voussoir more than it really has; and also obviates the defects which generally attend the construction of skew bridges, by the acute angles of the quoins being broken off or injured, either by settlement or accidental blows. The idea of cutting off the acute angles of such arches emanated, we believe, from Mr. George Buck, the resident engineer of the line from London to Tring. The perfect manner in which the whole of the stone work, and the spiral courses of the bricks, are executed, reflects great credit upon the builders, Messrs. Cubitt, of London.

The Railway is continued across the Box Moor Valley by an embankment varying from twenty-five to thirty feet in height, and almost immediately passes over the Grand Junction Canal by an iron bridge, similar to that before described. After passing two short excavations and embankments, presenting occasional views of richly diversified scenery, to the BERKHAMPSTEAD STATION, distant from London twenty-eight and Birmingham eighty-four miles.

This Station is built of brick, with stone dressings in the Gothic style; and the situation in which it stands gives it a very picturesque effect. The Railway approaches so near the Grand Junction Canal at this point, that it is supported by a very extensive retaining wall on one side, the length of which is 650 feet; and has a parapet wall at top, giving it

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the appearance, from the Railway, of a long viaduct. On the opposite side of the Railway are distinctly visible the remains of ditches and mounds of earth, appertaining to the ancient castle of Berkhampstead.

The old castle of Berkhampstead was probably erected by the Saxons, and the town formerly called Berghamstedt, being built among the hills.* William the First passed through this town on his way to London after the battle of Hastings, on which occasion his progress was impeded by the Abbot of St. Albans, who was assisted by the nobles and prelates of the adjacent district. The Conqueror met this confederacy at Berkhampstead Castle, when he swore to rule according to the ancient laws and customs of the country. It was not long before the oath was broken; and in the distribution of territory he bestowed this castle on his half brother, Robert Moreton, Earl of Cornwall. The castle was strengthened by King John, and was afterwards besieged by the Dauphin of France, who came to assist the discontented barons. When Edward III. advanced his gallant son, the Black Prince, to the dignity of Duke of Cornwall, the castle and manor of Berkhampstead were given to him, "to hold to him and the heirs of him, and the eldest sons of the Kings of England, and the Dukes of the said place." Since then the estates have descended from the Crown to the Princes of Wales, as heirs to the throne and Dukes of Cornwall.

Berkhampstead Church, dedicated to St. Peter, is built in the form of a cross, with a square embattled tower rising

* *Berg* meaning a hill, *Ham* a town, and *Stedt* a seat; or *Burg* a fortified place, and *Ham-Stede* the homestead.

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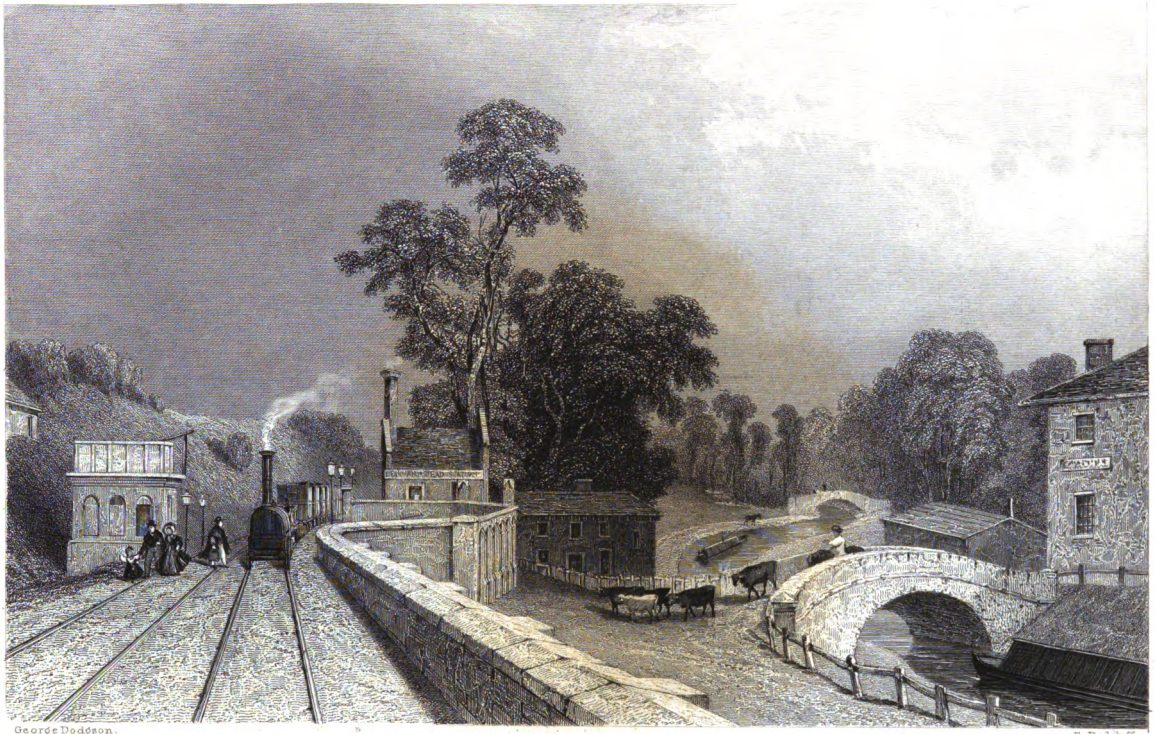

George Dodgson. E. Radclyffe.

BERKHAMPSTEAD STATION.

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from the intersection, which contains four fine Gothic windows; and on the outside of it a sculpture of an angel supporting a shield, on which the arms of England impale those of the church of St. Paul. Several small chapels and chantries were founded here in Catholic times, and are still partially divided from the body of the church. A number of sepulchral memorials, some of very ancient date, are distributed in various parts of it; one of the more modern is to the memory of the mother of the poet Cowper, whose father, Dr. John Cowper, was rector of this parish. Here also was this delightful poet born, and amidst its rural scenes his early youth was spent.

Leaving Berkhampstead behind us, the Dudswell excavation, which is upwards of fifty feet deep in some parts through the chalk formation, immediately follows. At about the middle of it we pass through the North Church Tunnel, the length of which is one fifth of a mile. It has two handsome fronts of stone, with side walls of brick work, and is of the same height and proportions as the Watford Tunnel. The upper strata of the Dudswell excavation are formed of wider slopes than the lower portion, owing to a different nature of the soil; and it has also a bench where they unite, to give security to the slopes.

Ashridge Park, the princely residence of the Countess of Bridgewater, lies about a mile to the eastward. To those who enjoy the beauties of nature,—spreading trees, such as the name of the place would seem to import, luxuriant foliage, and graceful scenery,—a visit to this magnificent mansion and park cannot fail to trace on their minds images of beauty and grandeur, which time will not easily efface.

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Ashridge Park appears but little known to the public, owing, doubtless, to the small amount of traffic which heretofore came through this part of the country,—lying, as it has done, out of the usual route of travellers; but we confidently affirm that as soon as its beauties become recognised, it will be one of the most frequented spots in this part of the kingdom. The very easy approach which the opening of the Railway affords to such scenes, will have the effect of bringing into notice many of Nature's choicest works, which heretofore have been comparatively closed from observation. In every instance, let the traveller or tourist supply himself with a copy of Cheffins's Map, which he will find a very useful as well as faithful guide.*

After passing through a cutting of one mile and a quarter in length, and under four bridges, at about thirty-two miles from London we arrive at the TRING STATION, where ample accommodation is provided for passengers. We would earnestly recommend those who, from the nature of their pursuits,

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* Mr. Cheffins, the eminent Land Surveyor and Mechanical and Engineering Draftsman, of London, has published, by authority of the London and Birmingham and Grand Junction Railway Companies, Official Maps of each Railway, on a scale of half an inch to a mile. These are the only authentic Maps of either Railway, and will be found extremely useful to the nobility, gentry, clergy, land owners, and all persons interested in, or residing on, property within twenty or thirty miles of the line, as the Maps embrace the country to this extent. For the convenience of travellers, Mr. Cheffins has published the Official Maps on a reduced scale, for the pocket. The Editor of the *Civil Engineer and Architects' Journal* thinks so highly of Mr. Cheffins's Maps, that he says, in his notice of them,—"The smaller ones should be in the hands of every person who intends to travel by either of the Railways."—The very reasonable price at which Mr. Cheffins's Maps are published, is the astonishment of all intelligent purchasers.

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are domiciled in London, to enjoy an hour and a half's ride to this spot, the country surrounding it being of the most diversified and delightful character.

Tring Station is close to the village of Pendley; and about two miles from the town of Tring, which is of great antiquity. On the south-east of it is Tring Park, consisting of between three and four hundred acres, surrounded by a mountainous and rugged district, though the park itself is tolerably well wooded. There is nothing particular about the house, which was erected by Sir Christopher Wren; but the old mansion is stated to have been built by Charles II. for the celebrated Nell Gwynne. The ancient town of Ivinghoe is three miles north of the Tring Station. In the church is an old tombstone, five hundred years old, with an inscription in Norman-French. Henry de Blois, Bishop of Winchester, founded a Benedictine nunnery here in 1160, which Henry I. endowed with lands. De Blois was the nephew of the Norman Conqueror, and through his exertions his brother Stephen became King of England.

Leaving the Tring Station towards Birmingham the traveller passes under a bridge, and immediately enters one of the most stupendous cuttings to be found in this country. It is the excavation through the great chalk ridge of Ivinghoe, and forms the summit level of the Railway; the elevation being upwards of 300 feet higher than at London, and about 420 above the level of the sea. The contemplation of this vast undertaking fills the mind with wonder and admiration. As far as the eye can range, one immense chasm through the earth appears before the observer, and at intervals are bridges carrying roads across the Railway at a fearful height; whilst

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below all is still, save the occasional footsteps of the policemen on duty, or the distant sounds of an advancing train. The echoes in this place are very distinct, and whilst traversing its extent you seem shut out from all communication with the world, except these invisible mocking birds of your own voice.

The Tring Excavation is about two miles and a half long. The strata through which it was cut are composed of the lower or grey chalk formation, without flints. It averages forty feet, and for about one quarter of a mile is fifty-seven feet in depth. Out of this hill were taken one million and a half cubic yards of earth, which had to be lifted to the surface,—a height of forty feet,—and then deposited in spoil banks. It was executed by means of a number of "horse runs," so called by excavators, from the men being drawn up planks nearly in a perpendicular position, by horses. A rope is attached to the front of the barrow containing the soil, while the excavator takes firm hold of the handles, and both barrow and man are drawn up the plank,—the latter having his body nearly horizontal during the ascent. It is a fearful practice; and should any accident occur, by the breaking of the rope or restiveness of the horse, the workman is precipitated to the bottom in an instant. During the progress of the excavations many impressions of fossils were found, chiefly common oysters, nautili, ammonites, &c.; also many concretions of iron pyrites, which were always found of a cylindrical or spherical form, with a radiated structure in their fracture. In a small portion of the cutting in gravel or alluvial deposit, above the chalk, and at about fifteen feet deep, were found the tusk and teeth of an elephant.

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Before we terminate our notice of the district, we think it right to notice the manner in which the whole of this portion of the line has been executed. It appears of the most perfect description; not a slip or a fault is to be found in the whole length of the deep excavation, and the brickwork of the very lofty arches is most substantial. To Mr. S. S. Bennett, the assistant engineer, the merit is due of having executed, in its most perfect manner, the conceptions of the master mind of him who designed this vast effort of skill and enterprise. Assuredly the name of Robert Stephenson will, in after years, be recorded as one of the greatest men of the age in which he lived.

At about thirty-three miles from London, where a lofty bridge of three arches spans the cutting, the Icknield or Roman way is crossed; and near this spot fifteen or sixteen skeletons were found, as also some Roman pottery. About two feet below the surface, near Pitstone Green, in excavating a road for a headway to a bridge, two antique urns were discovered, which are now in the possession of the Antiquarian Society.

At Tring, and near Wolston, many Roman vases and vessels were found in the formation of the Railway; in fact, as may naturally be supposed in works of such magnitude, hardly a cutting of average depth was finished without some relic of ancient days being discovered, or some geological specimen worth preserving being found, and in the largest excavations they were both numerous and interesting in the highest degree.

When the lower chalk is reached, the gravel and also the flints disappear; and at Tring there is scarcely a trace of either. The strata at the bottom of the cutting almost

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approach chalk marl. The great thickness of the chalk is clearly shewn by the long line of intersection it makes with the Railway, which crosses it here nearly at right angles.

In descending from the Tring summit towards Leighton Buzzard, the chalk marl, green sand, and weald clay formations, are met with; but they are only intersected by the shallow cuttings. The presence of these formations is, however, made sensibly evident by the birdlime properties of the soil, which by no means facilitates the field labours of a Parliamentary campaigner, when time is an object of great importance. In such cases it is usual for surveying parties, when in motion, to attempt to run; but in this district walking was a toilsome process, and running quite out of the question. At Leighton the line crosses the iron sand formation, which is found here in cliffs and abrupt hills. One of these is pierced by the Leighton Tunnel. The nodules of ironstone found mixed with the iron sand form some of the best ballasting in use upon the whole line. The oolitic series are next crossed, making their first appearance a little to the northward of Leighton, and extending to the crossing of the river Avon at Wolston. This distance includes the Blisworth and Kilsby summits, as also the basins of the Ouse and Nen.

The embankment which succeeds the Tring cutting is, with slight interruptions of a cutting or two, six miles long, and is about thirty feet in height. In its construction, 828,000 cubic yards of earth were consumed.

Just beyond the thirty-fourth mile, another of those oblique iron bridges before named crosses the Grand Junction Canal near Seabrook; and a little farther on, near the village of

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Cheddington, is the railway connecting the populous town of Aylesbury with this line—by which the produce of its rich vale finds readier means of access to the markets of the metropolis. This branch railway is about nine miles in length; the country through which it passes being nearly on a level with the rails, scarcely any cutting or embankment was required. The town of Aylesbury is built on a slight elevation, in the middle of the luxuriant scenery by which it is surrounded. The vale extends over a great extent of country, which is found better calculated for grazing land than any other in the kingdom. Camden says—"Round about the town of Aylesbury are numerous flocks of sheep, loaded with wool, and yielding great profit to their owners."

The slight embankments and level country we are now rapidly passing over form an agreeable contrast to the deep cuttings so lately left behind, and on either side the vale stretches far away beyond the point of vision. A little onwards we catch a glimpse of the large octagonal spire of Leighton Buzzard, which being in a fine open country greets the traveller's eye from a considerable distance, and at about forty miles from London, arrive at the LEIGHTON BUZZARD STATION.

The town of Leighton is just half a mile from the Station, and on the borders of the county of Bedford. It was anciently called Leighton *Beau-de-sert*. In an open area, in the centre of the market-place, is a remarkably handsome pentangular cross, of great antiquity. It appears, from the court-roll of the town, that about 1650 it was in a very ruinous state, on which occasion it was ordered to be repaired by the court-leet. It is twenty-seven feet high above the

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basement, which is raised about five feet, and consists of rows of steps. The centre pillar, supporting the arch, is nearly eighteen inches wide; the upper story being divided into five niches, within each of which was a statue, which are now sadly mutilated. Leighton church is a large building, erected of the same sort of stone as the cross. At the intersection rises a massive square tower, surmounted with an elegant spire.

Within half a mile of Leighton Buzzard we enter an excavation, about fifty feet deep, and approach the Linslade Tunnel, which requires particular notice from having been formed through the hill on a curve of less than a mile radius through its whole length. It is the only curved tunnel on the line, and is made through a stratum of indurated sand, having bands of iron-stone in it,—a formation extending beyond Woburn, and forming the Woburn Sands.

The tunnel is 285 yards in length; and 20,430 cubic yards of soil were taken from it. Had not this tunnel been formed, the excavation would have been upwards of eighty feet deep. From the summit of the hill, the views in either direction, particularly north or south, are of surpassing loveliness. The south entrance exhibits a bold rusticated stone front, the face of the arch being battered; and over it is a massive stone Torus, which has a very handsome appearance. The side walls are executed in red brick, and being kept back from the face of the arch give effect to the principal feature of the design.

The north front of the tunnel is of a different design to the works of a similar nature on the line. It consists of two massive octagonal piers, with battlements at top, which are about

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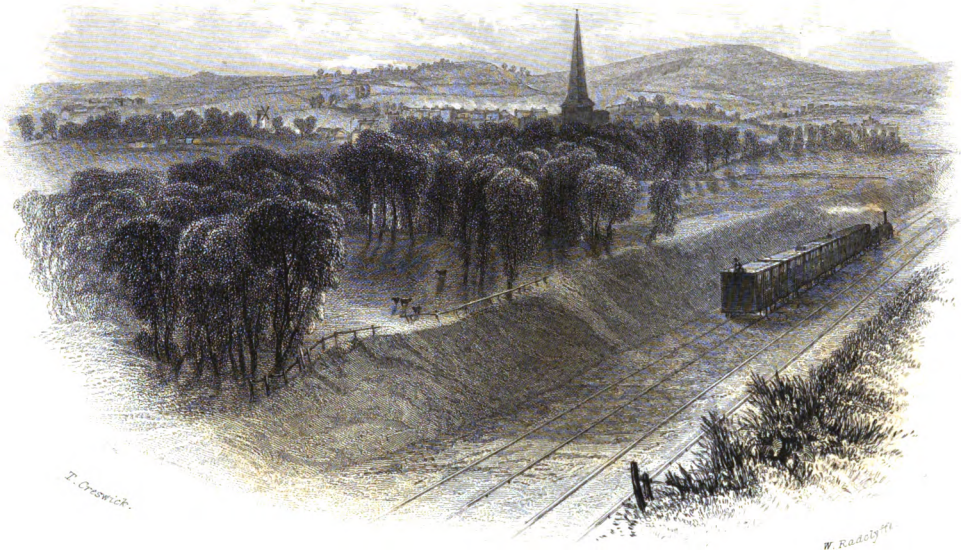

LEIGHTON BUSSARD.

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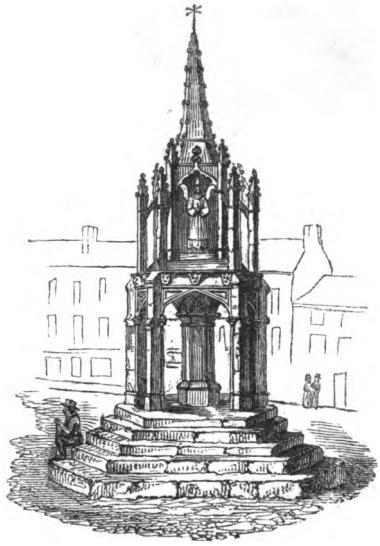
forty feet high; there are wing walls on either side, which with the face of the arch are also embattled. The side walls are terminated by octagonal piers with stone caps, and altogether the front produces a very picturesque effect. This is not a little heightened by the very bold manner in which the cutting beyond it is executed,—large masses of sandy rock having been left in bold projection, the lights and shadows upon which help to give increased grandeur to the scene.



CROSS AT LEIGHTON BUZZARD.

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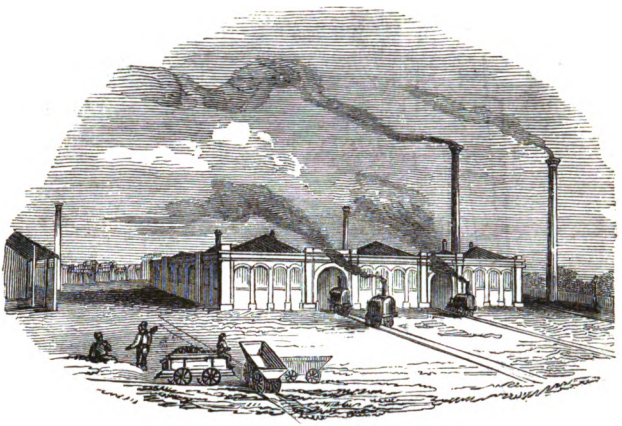

ENGINE HOUSE AT CAMDEN TOWN.

CHAPTER IX.

EMERGING from the abyss of the Linslade Tunnel into the ironsand excavation, the vivid red slopes of which, with the sudden transition from darkness to light, will produce the most powerful effect on the vision, and cause the traveller for a moment to close his eyes. No sooner, however, can he bear the full broad daylight, than, looking to the east, the green meadows of the Ousel valley will relieve his vision; and if he happen to glance forward towards the direction of the train, a romantic scene is discovered, formed by the perpendicular side of the Jackdaw Cliff, and the varied

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foliage extending from the summit of the hill to the canal. A large oak tree, which slipped from the edge of the cliff during the execution of the works, being a distance of about forty feet, is now growing in an erect position, improving the landscape by this novel way of transplantation. Passing the hill, which soon conceals this view, and looking nearly in the same direction, the church of Linslade appears against the dark trees, which, with many others, some years ago, formed an avenue to the mansion house, formerly the residence of Sir Andrew Corbet, Bart. The present owner of this property lately ordered some ancient timber to be felled near the house, which for ages had been the abode of a tribe of ravens. These birds are, perhaps, symbolic of the ancient family of Corbet, as appears from several shields which adorn the church and mansion, with the motto—"*Deus pascit corvos.*"

The geological character of the district changes near the point where the Railway leaves the canal, which is at the north end of the Linslade estate, where a bed of very fine light coloured clay was excavated after the ironsand, of about thirty yards in length, abounding with large organic remains. A few specimens of fossil bone were discovered in the same excavation, where the nature of the strata was more similar to the general character of the Oxford clay; but these were very imperfect compared with those which had been previously found in the soft clay.

After travelling over two embankments in Soulbury, and two in Stoke Hammond, the church of which is seen to the right, the train runs through a cutting passing across the south boundary of the parish of Bletchley, with the pinnacled

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tower of its little sanctuary rising from a hill on the left. An embankment is entered upon which is about one mile and half in length, containing four hundred thousand cubic yards of material, from which the villages of Great Brickhill, Little Brickhill, and Bow Brickhill, are seen towards the south-east, and some rich and extensive prospects. At the north end of the embankment the line enters the Bletchley estate, on which stood the residence of the late Browne Willis, Esq. He was distinguished by his learning and virtues; yet, perhaps, more as an antiquary and historian, as appears manifest from some of his works.*

Arriving at about the forty-eighth mile from London, the Railway crosses, at an angle of twenty-five degrees, the London and Holyhead turnpike road, by an iron bridge or gallery, of considerable extent, which is in one part founded on a Roman ford, in the line of the ancient Watling Street. This was discovered, during the progress of the work, about six feet below the present surface of the roadway, composed of a layer of thickets or brushwood, with a covering of

* The church at Fenny Stratford was erected under his direction, from funds chiefly obtained from his friends; and the adornment of Bletchley church cost him upwards of £1,300, as appears from a manuscript in the possession of the Rector of Bletchley. He presented a large Prayer Book to this church which belonged to Charles I., and which now remains in an iron chest with other gifts from the same donor. It is recorded in the above mentioned manuscript, that this church was repaired by the Duke of Buckingham in 1629, to whom the manor of Bletchley most probably belonged. This property, with the estate of Water Hall, near Water Eaton, was also possessed by Lords de Ruthven, Lords de Grey, and Lords de Wilton. Discoveries of broken implements of war and human bones, in the excavations, seem to indicate that some of these barons have probably joined the skirmishes which occurred in this neighbourhood.

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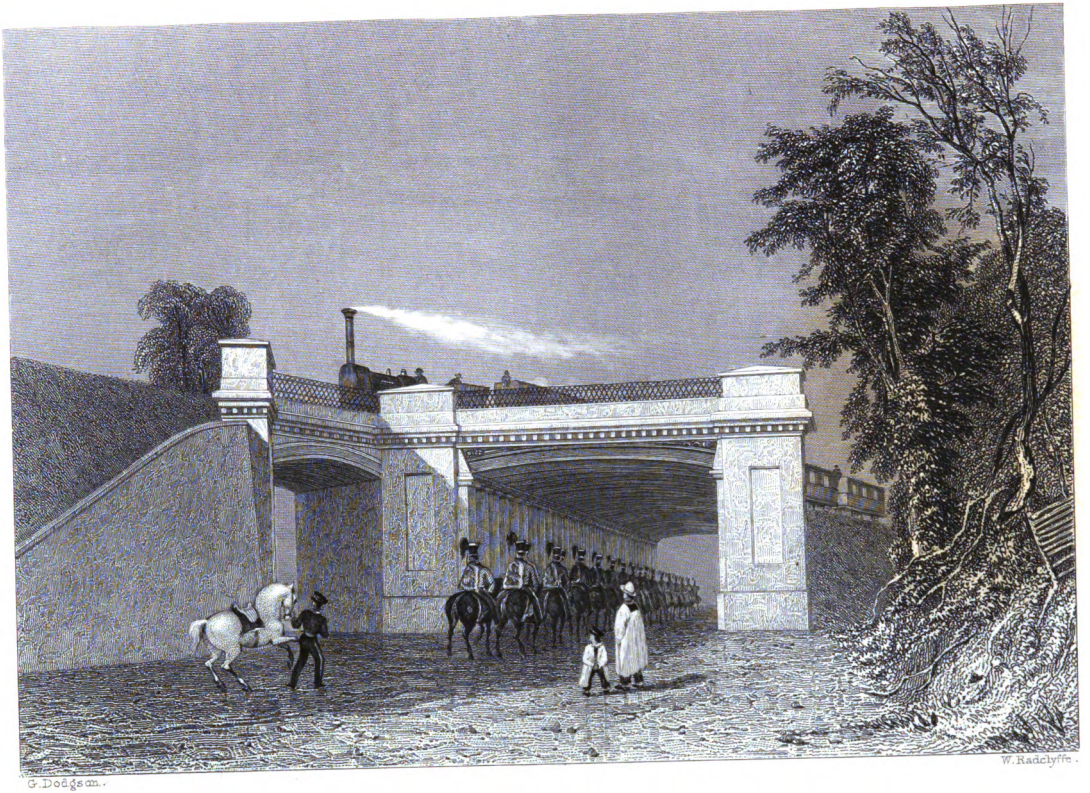

G. Dodgson.

W. Radclyffe.

DENBIGH HALL BRIDGE.

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gravel, in which was inserted a very close pavement. The road here reaches what was formerly the Denbigh Hall Station.

Denbigh Hall Bridge has a very massive appearance from the road beneath, and is ingeniously contrived to supersede the necessity of erecting a very oblique arch, which, as the level of the Railway was required to be kept low at this point, would have been a work of considerable difficulty and much expense—the trustees not allowing the angle of the road to be altered in the slightest degree. It was obviated by building a long gallery, composed of side walls, upon which were laid very flat segmental iron ribs, and was extended far enough to allow the Railway to pass over very obliquely, whilst each end of the bridge is square with the road, and only of thirty-four feet span, which (had a skew bridge been built instead) would otherwise have been increased to eighty feet. The total length of the bridge is about two hundred feet; the height, from the road to the soffit of the arch, is twenty feet; the weight of iron consumed in its erection was one hundred and sixty tons; and the quantity of brickwork 2,660 cubic yards. The elevation at each end towards the road consists of two massive stone piers, surmounted by a blocking and cornice; and over the arch is a neat iron railing, which gives the bridge an appearance of extreme lightness and grace. The side arch, seen in the engraving, leads under the Railway to some farm buildings, and is so admirably arranged, that it keeps up the character of the design without injuring its effect.

In the immediate neighbourhood of the work we have just described, stands an insignificant-looking inn, which bears

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the imposing title of Denbigh Hall—a name which is doubtless familiar to most of our readers; and to those who are unacquainted with its origin, the following anecdote may be considered interesting. An obscure dwelling once stood on the site of the present humble inn, near the bridge, which was inhabited by an old woman named Moll Norris. One winter's night, when the Earl of Denbigh was travelling near the place, the passage of the road became stopped up by snow drifts, and his lordship was obliged to seek the shelter afforded by Moll Norris's dwelling. He remained in his weather-bound situation for some time, and when, at length, he called for a bill, the old woman brought him a hatchet, not knowing, probably, the fashion, which might not then be common, of settling accounts at hostelries in those days. It is added that the earl kept the hatchet, as a memorial of the event, or in remembrance of the old woman's ignorance; and after paying well for the implement, his board, and his lodging,—which, probably, pleased her as much as the honour of the earl's visit,—the place became known by the dignified appellation of Denbigh Hall.

In the division of the line of Railway from the north entrance of Linslade Tunnel to the centre of Denbigh Hall cutting, 1,000,000 cubic yards of material have been moved, and 20,000 cubic yards of brickwork executed.

For a few months previous to the entire opening of the Railway, in September, 1838, travellers were conveyed from London to Denbigh Hall, and from Rugby to Birmingham, by locomotive engines—the intermediate distance being performed by coaches, under the direction of the Company. The trains from London brought passengers to the Denbigh

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Hall Bridge, where a temporary station had been erected, and where the coaches and omnibuses stood in readiness to receive them. Such a scene of bustle and confusion has seldom been witnessed as on the arrival of a train. Tickets had to be shewn which were given in London on booking; these were a passport to the coaches, &c. It frequently happened, however, that parties had, during the journey, lost their tickets, so that the fare had to be paid again, or they were left behind.* Then the luggage was another source of anxiety; and, lastly, it frequently happened that extra passengers were stowed into a coach or omnibus—more having been booked than could be conveniently accommodated. Bad as all this appears to have been, the public soon felt the value of even shortening the time of a journey from London to Birmingham a few hours; and they did not seem to mind the inconvenience, as they well supported the Railway during the time this mode of conveyance lasted. It was quite amusing to hear the complaints about the slowness of the coaches on the road, which, indeed, travelled about eleven miles per hour, and the perpetual contrasts made between the speed and comfort of

* On the partial opening of the Railway there were unfortunately not sufficient coaches contracted for, to traverse the intervening space from Rugby to Denbigh Hall, so that many persons could not obtain a passage, which occasioned great inconvenience. As far as the Railway was concerned, any number of passengers could be conveyed; but on this middle ground there was a limit, beyond which no person could be booked. For several days before the coronation of Victoria I. every seat from Birmingham to London was secured; and hundreds of persons, who travelled to Birmingham in expectation of proceeding by the Railway, were disappointed. At this time from £10. to £20. were offered for a seat. After all the chaises in the town had been engaged, donkey chaises, hackney coaches, carts, and wagons, were put in requisition at enormous prices.

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the old and the present rate of travelling, which this mingled mode of conveyance most opportunely offered.

As might naturally be expected, a Station so placed as at Denbigh Hall—being, for the time, like a *terminus* to a railway—had the effect of drawing to the spot an immense number of people, in all sorts of vehicles. There was a great demand in consequence for post-horses, to convey private carriages to their destination on arriving from London; so much so, indeed, that there was frequently not half a supply. Since the Railway has been completed, this station has been removed to Wolverton: the trains now pass by the spot with the swiftness of an eagle, scarcely affording time to see that there is such a place in existence.

About one mile from the Railway is the town of Fenny Stratford, so called from the situation of the surrounding lands, though the town itself is built on a slight eminence. It is recorded that this town suffered so much from the plague in 1665, that business was totally suspended; and that, on account of the hostelries being closed, the high road was turned into another channel, which so much injured the weekly market that it has never since attained its former celebrity.

In forming the Denbigh Hall Excavation, the workmen discovered a great number of human bones, and those of animals, apparently deposited in a kind of trench, which are supposed to have been buried there at the time of the plague.

Mr. Jackson, the assistant engineer, under whose superintendence the portion of Railway from Linslade Tunnel to Denbigh Cutting has been so efficiently executed, discovered,

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near Castlethorpe, several human skeletons imbedded in stone, in excellent preservation. These had probably remained in the earth since the reign of King John, as they were found near to some intrenchments not far from the site of the castle taken from the owner, for the king, by Fulke de Brent. About a quarter of a mile from these remains, a very ancient well was discovered—probably of Roman date, from the superiority of the workmanship. This well was about fifteen feet deep and twenty inches in diameter, walled with very small stones set dry, and filled with earth to the depth of six or seven feet from the surface; and so solid was the material become, that it bore exactly the same appearance as that in the excavation.

Immediately after passing the Denbigh Hall Bridge we enter a long and deep cutting, extending about three quarters of a mile, and varying from thirty to forty-two feet in depth, from which 551,329 cubic yards of earth and stone were removed. This excavation is spanned by a lofty and elegantly proportioned bridge of three arches. At the termination of this defile the village of Loughton, with its massive tower rising from amidst a clump of fir trees, forms a beautiful object to the left of the line; and proceeding onwards we again enter another short excavation having three bridges thrown across the Railway. The train presently emerges from the shadows of this cutting, and an interesting and picturesque view bursts upon the sight, including the village of Bradwell, with its singular, old barn-like looking church. Some slight embankments and cuttings succeed, in the last of which is a lofty bridge of three arches, of a semicircular form, thrown across the cutting, which being built of blue

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limestone, with a rock rustic face and bold chamfered joints, has a remarkably picturesque appearance as the train passes beneath it, and, at length, we arrive at the WOLVERTON STATION, one of the most important points on the line, distant from London fifty-two, and from Birmingham sixty miles, and about 200 feet above the level of the sea. The nearest town to Wolverton Station is Stoney Stratford, situate about two miles to the west, on the great Holyhead road.

The magnitude of the works at Wolverton is the wonder and admiration of all who travel along the Railway, and it will readily be perceived that the utility of having a great central station, on such a long line of road, was one of the first considerations; and it fortunately happens that the site is locally convenient as regards communication laterally by roads, and also by canal. It was therefore determined, that at this place a large manufactory should be erected, for the purpose of repairing engines and other machinery connected with the traffic; and, also, that a depôt for the reception of goods and cattle should be provided; whilst accommodation was secured by the erection of dwellings for the artificers; it being contemplated that when at full work, nearly one thousand persons are employed at this station alone.

The large building seen to the left of the Railway, before arriving at the canal, is the Wolverton Locomotive Engine Station, which will be devoted wholly to the repairs, &c., of the engines and machinery; as the locomotives do not run through the whole length of the line, but change at this station, it is requisite that there should always be a stock in readiness to meet any demand. It was erected from the designs and under the superintendance of Mr. G. Aitcheson,

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architect of London, a gentleman who has for some time past devoted his attention to works of this description, and who has the appointment of architect to the Stations upon this line.

The building is of a quadrangular form, each side being 314 feet long; it is built of brick, with stone cornice and blockings, the style of architecture being Doric. But here there appears no extraneous ornament, all being in character with the objects for which it is designed; yet the extent of the building is so great, that it has a very imposing appearance. The entrance from the Railway is by an arch of a semicircular form, which leads to a large open area, entirely surrounded with buildings. On either side of the entrance are the erecting shops for engines; and around the court-yard are the engine and tender sheds, the joiners' shop, iron foundry, boiler yard, hooping furnaces, iron warehouse, smithy, turning shops, offices, stores, a steam-engine for giving motion to the machinery, and for pumping water into a large tank over the entrance gateway, to supply the locomotive engines; in short, every convenience that a large manufactory of this nature can require is provided. Between the building and the canal, a space of about two acres is set apart for a wharf, and store yard for timber, trucks, &c.; and on the eastern side of the Railway, opposite the engine station, is a space of several acres appropriated to the reception of goods and cattle; it is bounded on the north and east by the Grand Junction Canal, (which here bends round towards the southward) and on the south by an occupation road, the Railway running on the western side. A layby has been already formed on the canal, and a large shed erected adjoin-

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ing, for the purpose of receiving goods from the canal to be forwarded by Railway; this has been in operation since the entire opening of the line, and trains of goods now run regularly from hence to London. Waiting and refreshment rooms are erected close to the station for the accommodation of passengers, as this is the only place between London and Birmingham at which time is allowed to take refreshment. It is contemplated that on the Station, and the works connected with it, a sum of £100,000., has been expended.

The Railway next crosses the Grand Junction Canal, at an elevation of fourteen feet, by a neat iron bridge formed of flat ribs, the outer ones being pannelled; an iron railing extends over the whole length of the bridge and retaining walls, which gives it a light appearance. The bridge is extended on the eastern side of the Railway, where a newly formed road crosses it, leading to the station and offices. Immediately after passing which we enter on the great Wolverton Embankment, formed across the valley of the Ouse. This embankment is the largest on the line, being one mile and a half long, averaging 48 feet in height, and containing 500,000 cubic yards; nearly in the centre of it stands the WOLVERTON VIADUCT, beneath which flow the diverted channel of the rivers Ouse and Tow. The viaduct is built of brick of a peculiarly fine colour, and the stupendousness and grandeur of its proportions are best observed from the meadows where Mr. Dodgson's view was taken. It consists of six elliptical arches of sixty feet span each, rising twenty feet; the height to the soffit being forty-six feet. At either end are two massive pilasters, with stone cornice and blockings, and beyond are three smaller arches, which pierce the retaining walls, built

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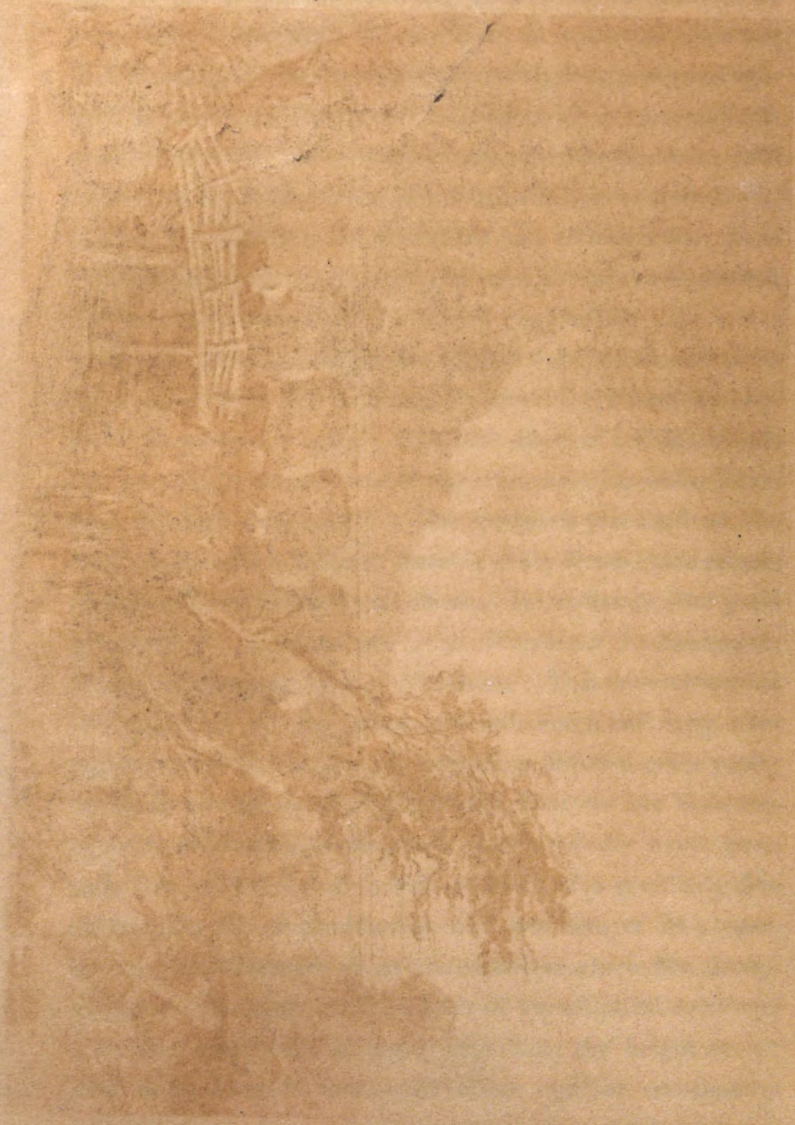

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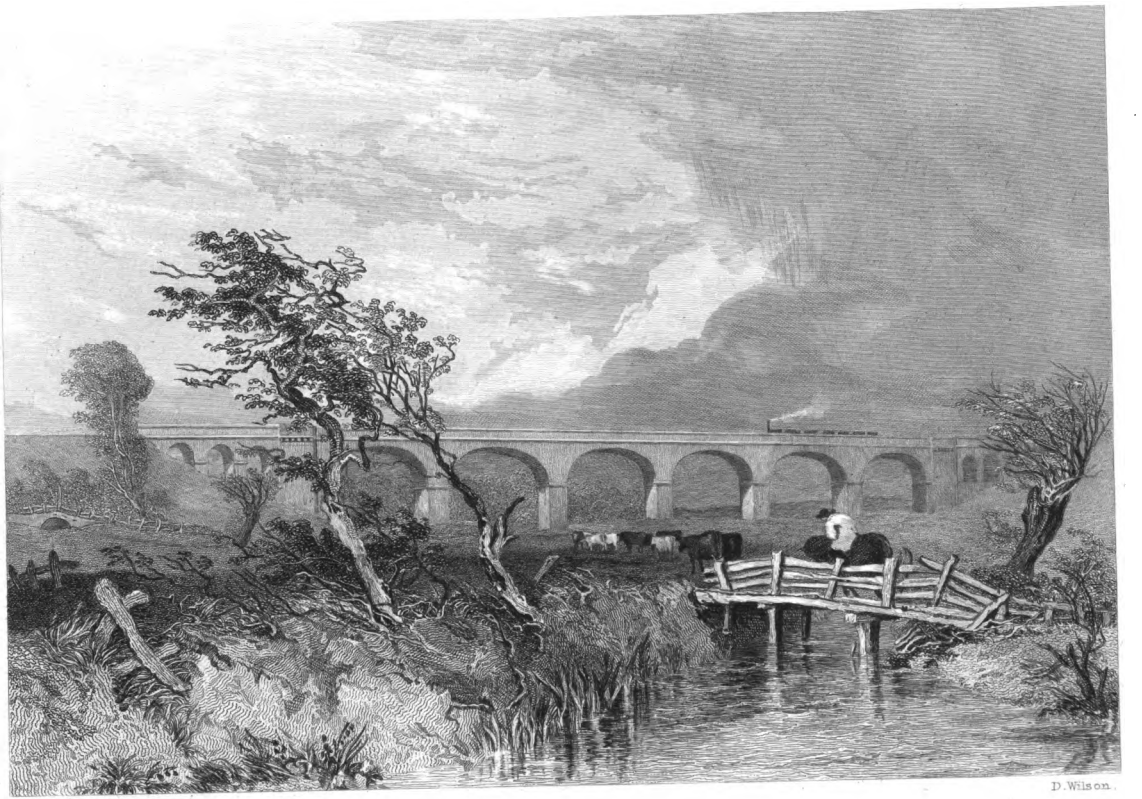

G. Dodgson.

D. Wilson.

THE WARRINGTON VIADUCT

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in the slope of the embankment; the cornice is continued throughout the whole length of the viaduct, and is surmounted by a parapet wall, the top of which is fifty-seven feet from the level of the ground; the total length of the viaduct is 660 feet, or one eighth of a mile, and the cost of its erection was £28,000.

In contemplating this magnificent structure the eye is forcibly struck with the beauty of the design, and elegance of its proportions, whilst the masterly execution of the work reflects great credit on those who were engaged in its erection.

In the formation of the embankment at Wolverton, great difficulties were encountered. On the north side of the Viaduct the material is composed of blue clay, lias limestone, gravel, and sand. This part of the embankment stood very well, except in one place where it slipped, not on account of its being composed of bad material, but from the ground itself actually yielding when the weight of the embankment came on it. The length of the embankment being one mile and twenty-eight chains (deducting the viaduct), and the height of a great part of it forty-eight feet, some accidents were to be expected, especially in bad weather; but no one could have imagined what would take place on the south side of the viaduct. Here the material, at the commencement, was composed of sand, gravel, and blue clay: this stood very well; but when the workmen went deeper into the cutting, they excavated some black, soapy clay; this was tipped on to a turf bottom, and the weather being also very unfavourable, although every care was taken to mix dry stuff with the wet material, yet there occurred one of the worst, if not the worst slip, along the whole line. Earth was tipped

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in for days and days, and not the slightest progress was made; as fast, in fact, as it was tipped in at the top it kept bulging out at the bottom, till it had run out from 160 to 170 feet from the top of the embankment; and at last a temporary wooden bridge was formed, and, by wagoning the earth over this, the embankment between the slip and the viaduct was formed, by first digging a trench, five feet deep, and nearly the whole width of the embankment, and forming a mound on each side to prevent it from giving way.

In fine Summer weather the bridge was removed, and that part of the embankment, where the slip had been, was filled up; but away it went again, just as it did before, and the yawning gulf appeared to be insatiable. It was only after incredible labour and patience that it was conquered, and this was done by barrowing as much earth to the outer part of the slip as would balance the weight on the top.

There seemed to be no end to the vagaries of this embankment. There was a portion of alum shale in it, which contained sulphuret of iron; this becoming decomposed, spontaneous combustion ensued, and one fine morning there was the novel sight of a fifty feet embankment on fire, sleepers and all, to the great surprise of the beholders. The inhabitants of the neighbouring villages turned out, of course, in no small amazement on the occasion; and various were the contending opinions as to the why and the wherefore. Some said—"The Company were hard up for cash, and were going to melt some of the rails;" others, "that it was a visitation of Providence, like the tower of Babel." At last one village Solon settled the point—"Dang it," said he, "they can't make this here Railway arter all; and they've set it o'fire to cheat their creditors."

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Proceeding along the embankment, we may notice on the right the rural village of Castlethorpe, which lies close to the Railway; and beyond this appears the lofty, tapering church spire of the village of Hanslope, which, being built on the summit of very high ground, serves as a landmark to the surrounding country—the spire itself being 190 feet from the ground. The church is one of the most ancient buildings in the country, and is a specimen of early Gothic architecture. After clearing a short cutting, looking westerly we catch a glimpse of the tower of the church at Grafton, which village gives the title of Duke to the family of Fitzroy. It is narrated, that at this place Edward IV. was married to Lady Gray of Groby, whose brother, Lord Scales, shared in the chequered fortunes of the king, and becoming an object of jealousy to Richard Duke of Gloucester, was seized and carried to Pomfret Castle, where he was murdered. The old mansion, which was destroyed by the Parliamentary forces in 1643, was the scene of many important circumstances in our national history. Among other remarkable events, it is recorded that Richard III. fixed his head quarters here in 1483; that it was here the last interview occurred between Cardinal Campeggio and Henry VIII., relative to his divorce from his queen, Catherine of Spain, when the nuncio was unsuccessful in his exhortations to the profligate monarch; and that also Queen Elizabeth visited Grafton House, in her progress northward, in 1568.

About this spot we leave the county of Buckingham and enter that of Northampton; and passing rapidly over a lofty embankment, of about a mile in length, which divides the village of Ashton into two parts, shortly arrive at the Roade Station.

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This station which was first opened as a *second class* has now become a principal or *first class* station, in consequence of its being the point where coaches meet the trains to convey passengers to and from Northampton, Leicester, Nottingham, and some of the towns throughout these counties, as well as Lincolnshire and Bedfordshire.

BLISWORTH EXCAVATION.

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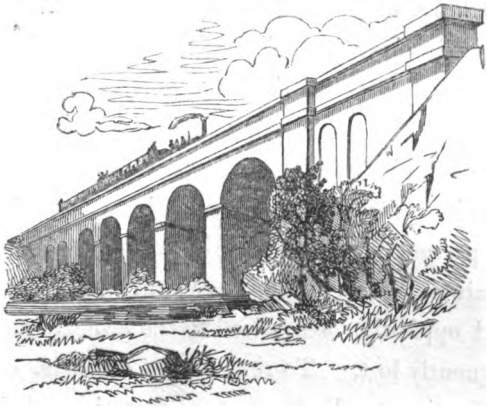

VIADUCT OVER THE COLNE.

CHAPTER X.

The little village of Roade, which lies close to the Railway, has suddenly become invested with all the bustle and activity of a large posting town; and will, no doubt, enjoy increasing consequence and prosperity from its locality to this great line of communication through the kingdom. This is one of the numerous instances, which could be adduced, of the great benefit which an important line of Railway confers upon the towns near which it is formed; and amidst the changes which are thus originated, many places that heretofore have been comparatively unknown will become towns of con-

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siderable extent, while others, hitherto vastly superior in population and commercial traffic, but lying at a distance from any line of Railway, will lose the source of their former prosperity.

As an instance of the inconvenience which the inhabitants of a town suffer from the channels of traffic being diverted from it, we may mention the case of Northampton. The original line of the London and Birmingham Railway, as marked out by Mr. Stephenson, was through Northampton, which from its central position would have been the Wolverton of the present line; so great, however, was the opposition which certain parties in authority entertained to it, that a most determined opposition was raised to the project, and the bill was consequently lost. To remove the obstacle, on a subsequent application to Parliament, a diversion of the former projected course took place, and it was so altered that the line was marked six miles from Northampton; thus precluding the possibility of Railway communication, except by a branch line, the expense of which must be wholly borne by the townspeople themselves,—or they must continue to submit to the present inconvenient mode of transit by coaches and omnibusses. But these headstrong men soon found out their mistake, for in the year 1837, when a company applied for a line of Railway from Derby, Nottingham, and Leicester to join the London and Birmingham line at Rugby, the strongest opposition they had to encounter was from the inhabitants of the town of Northampton, not because the proposed line of Railway came through their town, but really because it DID NOT do so; and they actually had a clause introduced in the bill to delay the formation of the line from Leicester to Rugby.

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This was done to allow another company, that had projected a line from Leicester through Northampton to join the London and Birmingham line at Blisworth, to obtain an act in the following session. It would be thought, therefore, that the inhabitants of this populous and wealthy town had now repented of their former error, and would apply themselves to recover the lost time, by at once seeking to obtain an act to make this desirable line. It will scarcely be believed, however, that they actually allowed the time to run out of the compulsory clause in the Act of the Midland Counties' Railway, which they had with so much expense obtained, and thus deprived themselves of the power of maintaining the reputation and increasing the traffic through their place, besides delaying the completion of an important line of Railway to Leicester, Nottingham, &c.

We will now draw the reader's attention to the difficulties experienced at Blisworth. This cutting is one of the largest on the line, and according to the original estimate, would have contained 800,000 cubic yards; in consequence, however, of the necessity which was found of adding to the length of the wide part of it, which was considered to be essentially requisite during the execution of the work, together with the materials arising from numerous slips in the upper part, the total quantity removed approximated to 1,000,000 cubic yards.

The greatest depth is about fifty-five feet, and the length a mile and a half. The materials excavated consisted of clay and limestone. The clay and rock may be described generally as running into strata nearly on a parallel with the line of rails, which rise from each end of the cutting towards its centre, at an inclination of sixteen feet in a mile.

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The different beds of rock in the excavation abound with fossil shells, in a good state of preservation consisting of nautilus, terebratula, oysters, &c. There were also two or three fossils of very considerable magnitude discovered, which were of the Saurian tribe, and were found embedded in a stratum immediately on the top of the rock. This rock is a species of half-formed stone, of considerable hardness when dry, but becoming soon softened when exposed to the air and damp.

The quantity of stone excavated was about one-third of the contents of the cutting, and considerable difficulties occurred at this point of the line. The rock was found not to reach to the depth of the excavation, and underneath it lay a deep bed of clay, in some parts to the thickness of twenty feet, through which the rails had to be carried. To secure this from bulging out, it was necessary to build retaining walls of considerable thickness along the sides of the excavation, which are inclined at two slopes, that portion which reaches from the Railway to the top of the rock is at one quarter to one, and for that above the rock the inclination is at two to one,—a ledge or benching, of nine feet in width, being formed where the two slopes meet. The object of the benching is to catch any loose portions of the clay which might be detached from above; they have also been found very useful in affording foundations for walls of pebble stone, which it has been found necessary to erect upon them in many places, to retain the numerous slips of the clay above.

Immediately below the solid rock, in some parts of the excavation, is a bed of loose shale, mixed with a considerable quantity of water, and to such an extent that pumps had to

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be constantly employed to allow the work to progress. This shale has been taken out, and the rock underset several feet, to allow retaining walls of stone to be built in its place; these walls, in fact, support the rock above, and as a further security, an inverted arch has been built beneath the Railway to the opposite side, in a similar manner to the inverts of tunnels. As soon as the retaining walls were built, a drift was formed behind them three feet six inches high by three feet wide, forming a culvert to receive the water, which still keeps abundantly flowing out of this strata; and at intervals there are openings left in the retaining walls to conduct the water to the side drains of the Railway where it is carried off.

During the first year and a half the progress of this excavation was extremely slow, owing to the want of proper energy on the part of the contractor, combined with general bad management. The time was frittered away without any thing like a proper quantity of work being done; and if this was evident at the commencement, when there were no particular difficulties to grapple with, what might be expected towards the end, when nothing but the most energetic measures could insure success? At last the Company were obliged to get rid of the contractor of the Blisworth excavation.

From the moment it came into the Company's hands, no trouble or expense was spared to remedy the evil of the previous slow progress; and nothing could exceed the animation of the scene which the works presented when in their most active state. From 700 to 800 workmen in vigorous employment,—numerous barrow and wagon runs in continual motion, —a steam-engine in constant activity pumping out the water, —locomotive engines at either end, dragging long trains of

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wagons full of earth, or bringing the empty ones back,—and blasts of the rock continually deafening the ear. In fact, the whole cutting seemed alive; and the busy hum of labour, resounding from the one end to the other, gave ample testimony to the zealous exertions of the engineer. Of course, the expense was considerable. The article of gunpowder alone was, in many cases, twenty-five barrels, of 100 lbs. each, per week; enormous quantities being used before the rock could be removed.

The mode of blasting made use of was by drilling a hole in the stone, about one inch in diameter, the depth being determined by the thickness of the bed. This was done by means of a round iron bar shod with steel, which was lifted up and then struck down in the hole, water being used with it to cause the stone to cut more readily, till the hole was drilled to the requisite depth. When sufficiently deep it was dried out; a piece of fuse of the requisite length was then put in, and the gunpowder poured all round it, and secured by a covering of pounded brick or stone. Several charges being thus prepared, the ends of the fuses were lighted, and the workmen retreated to a sufficient distance for security. In a few minutes the whole exploded, rending up large masses of rock, and sending the lighter pieces high into the air.

This excavation is crossed by five bridges, some of which are of considerable span, and present a fine appearance from the Railway. They are composed of a mixture of the stone of the cutting and brickwork. It was originally intended that the whole of the materials which came out of the excavation should be used in the formation of the embankments at each end of it, but owing to the slowness with which the work ad-

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vanced while under the contractor's hands, it was found necessary to throw about 150,000 cubic yards into spoil. The land for receiving this, together with that necessary to make up the corresponding deficiency in the embankments, of course, still further increased the expense of the work.

The stone, gravel, and clay which were taken from the south end, had to be conveyed an average distance of about a mile and a half, and considerable difficulty was found in the formation of the embankment near the village of Ashton, owing to the unsound state of the valley which formed its base. Immense quantities of materials were teemed daily, which, as in the case of the Wolverton embankment, totally disappeared, and the natural surface of the ground actually burst up outside the limits of the Railway, in consequence of the enormous pressure. A culvert near the spot was entirely destroyed from this cause.

The embankment at the north, or Birmingham end of the excavation, has more earth in it than the other; but the substratum on which its deepest part rests is of a better description, and no slip of any importance took place in that portion of the works; but a culvert of considerable length was in great danger of being crushed in; the expedient, however, of completely filling it with pebble stone was resorted to; notwithstanding this precaution it was carried considerably out of its straight direction, so much so that the light can but just be perceived when it is looked through. It may, perhaps, be thought uninteresting to mention works of so small a magnitude as culverts; but no person, who has any knowledge of the difficulty of their erection, when they have to sustain the weight of an embankment of forty or fifty feet in height,

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could feel otherwise than nervous during the process of placing the material over them. An engineer could be wished no worse fortune than to be required to construct culverts upon a soft foundation under a deep embankment.

From this view of the nature and extent of this contract, and the means which were resorted to, in order to make up for the serious delay which occurred while the work was under the contractor's hands, every body will be prepared to expect that a sum of nearly £100,000 has been expended beyond the original estimate; and been expended wisely too, as the loss would have been considerably greater if these exertions had not been made. Viewing the work altogether, it affords one of the finest specimens of engineering this country can boast of. It is a spot beset with difficulties of every kind, and the bold and effective manner in which it has been executed, is a bright example of the talents of the Engineer in Chief.

An inclined plane,* nearly a mile in length, succeeds this cutting, on either side of which, from the elevation of the embankment, the traveller enjoys uninterrupted prospects over the surrounding country, including many rural cottages

* Thirteen miles of the Railway are laid level—fifty-two at an inclination varying from one foot to fourteen feet in a mile—and forty-seven at inclinations varying between fourteen and sixteen feet per mile. The greatest difference of level between any two parts of the line is three hundred and eight feet; and the gradients change forty-four times. The longest continued length of level rails is about four miles; the greatest extent of any gradient is seven and a half miles; but there is an inclination in one direction, varying from one gradient to another, measuring fourteen miles. From London to Birmingham fifty-five miles ascend, forty-four descend, and thirteen are level. The land occupied by the Railway and stations may be estimated at nearly two thousand acres.

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BRIDGE IN THE ELISWORTH EMBANKMENT,

The Road leading from Towcester to Northampton.

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and picturesque seats, and will not fail to observe the square tower of Blisworth Church peering to the west. At a short distance we pass over a lofty bridge of one arch, which spans the high road between the towns of Towcester and Northampton. At this point is a covered staircase leading from the Railway to the Blisworth Station, which is of the second class; and half a mile further on, near Gayton Wharf, the Grand Junction Canal is crossed by a cast-iron bridge; leaving which, and passing through a skew bridge built of brick, the arch of which is constructed on a principle quite new in this country, we catch a glimpse of the church tower of Gayton village, pleasantly situated on the left upon rising ground. To the east, the Grand Junction Canal runs parallel for several miles to the Railway, and is separated from it here and there only by a single field,—both the Railway and Canal appearing to be nearly on the same level. At about the sixty-sixth mile the village of Bugbrook is seen to the east of the canal, with its church spire rising beautifully from among the trees.* Nothing of particular importance occurs until we reach the Stowe Hill Tunnel, which is four hundred and eighty four yards in length, and passes under the great Holyhead road, or ancient Watling Street, about sixty feet beneath it. It is of the same form and dimensions as the North Church and other Tunnels before described, and was worked from one main shaft, eight feet in diameter. The entrance fronts are of different characters of architecture:

* The execution of the works from Tring to Blisworth was entrusted to the able superintendence of Mr. Crossley, assistant engineer, in whom much confidence was placed from his great practical experience.

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that to the south consisting of two massive piers, projecting boldly from the side walls, with a cornice through the whole length; while the north entrance is in the castellated style, with a bold machicolated parapet, the coping however and mouldings being continued quite through without being broken into embrasures, and has retaining walls with buttresses continued to the foot of the slopes.* From the summit of the hill, above the Tunnel, are views of the most extensive and agreeable character. Looking southward, the eye stretches over an immense expanse of richly cultivated country, the line of Railway running nearly parallel with the Grand Junction Canal towards Blisworth, and in the extreme distance is the town of Northampton; while to the north, picturesque landscapes rise before the view, including the fine old church and village of Floore, and the high ridges of hills around Weedon and Daventry; and to the west is the very

* Great prejudice once existed against tunnels, arising entirely from ignorance; and the directors, in order to quiet the minds of the public, had a special visit to the Primrose-hill Tunnel made by Drs. Paris and Watson, Surgeons Lawrence and Lucas, and Mr. Phillips, the Lecturer on Chemistry,—the object being to ascertain the probable effect of such a tunnel on the health and feelings. The atmosphere of the tunnel was found to be dry, of an agreeable temperature, and free from smell. The lamps of the carriages were lighted; and in their transit inwards, and back again to the mouth of the tunnel, the sensation experienced was precisely that of travelling in a coach by night, between the walls of a narrow street. The noise did not prevent easy conversation, nor appear to be much greater in the tunnel than in the open air. Judging from this experiment, and knowing the ease and certainty with which thorough ventilation may be effected, these gentlemen were decidedly of opinion that no danger occurred in passing through well-constructed tunnels; and that the apprehensions which had been expressed, that such tunnels are likely to prove detrimental to the health, and unpleasant to travellers, were perfectly futile and groundless; and to these opinions they all signed their names.

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pleasant and cheerful village of Stowe, or Stowe Nine Churches, surrounded with beautiful scenery.

Emerging from the Tunnel, the scene that bursts upon us is of the most imposing character. Upon the rising ground stands the great military depôt of Weedon,—one of the most complete and extensive establishments of its kind in the kingdom. It consists of residences for the officers, storehouses for 200,000 stand of arms, artillery, and ammunition, workshops for artisans, an hospital, and extensive magazines for gunpowder, capable of containing about 5,000 barrels each. A short cut from the Grand Junction Canal communicates with the storehouses, and affords facilities of conveyance to all parts of the kingdom. The Railway crosses this cut about two feet above the level of the water, which of course would prevent any vessel passing it; the bridge, therefore, which conveys the Railway across moves upon wheels, so as to leave an opening for vessels to pass. This bridge is of a new construction, and consists entirely of iron, to avoid the effects of warping. The weight is about twenty tons; yet, by an ingenious arrangement of the mechanism, it is moved very easily; the necessity for which, however, luckily will not occur more than twice in a year. The width of the Canal over which it spans is small, but the platform had to be of a suitable width to carry the two lines of Railway over. The bridge is supported by three wheels of cast iron, which run upon a railway beneath, and the motion is produced by means of wheel work and an endless chain. When the bridge is in its place, the weight is relieved from the wheels by the use of four large screws, one at each corner of the bridge, and by this means the height of the rails

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is regulated to the greatest nicety. In the original Act of Parliament, the line of Railway passed round the western side of the depôt, forming a very sharp and objectionable curve; but in the following Session an amended Act was obtained, by which the course was altered to its present position, which is a great improvement upon the former plan.*

The valley of Weedon is passed over by means of an embankment and brick Viaduct of five arches, each of fifty feet span, and thirty-five feet in height. The village church is a welcome object, pleasantly situated in the valley below; the line rises to a level with its roof, overlooking all the surrounding objects, and on a Sabbath day the scene from it is of an animated character, the costume of military men mingling with the gay attire of the villagers of the neighbourhood, who stream through an arch of the viaduct towards the church, or spread themselves over the fields of the valley. Crossing the bridge before described, we enter an excavation the sides of which are supported by walls of brick, surmounted with iron railings, and forming the eastern boundary of the military depôt. This spot generally assumes a very enlivening appearance as the train advances—the soldiers collect together and range themselves along the top of the cutting, while the sentinels pace to and fro with steady and measured step, and frequently the sound of martial music bursts upon the ear.

We now arrive at the WEEDON STATION, distant from

* The whole of the important and difficult works at Blisworth and Weedon, were under the superintendence of Mr. George Henry Phipps, the assistant engineer of that district; who has very ably seconded the Engineering-in-Chief, in all the works entrusted to him.

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London sixty-nine and from Birmingham forty-three miles. The building is a neat structure, containing booking offices, waiting rooms, and every convenience that can be required; there are here also the usual contrivances for supplying the engines with water and fuel, which the close proximity of the station to the Grand Junction Canal affords ample means of obtaining. Weedon *on the Street*, or Weedon Beck, is a small town of considerable antiquity. Wulphere, King of Mercia, had a palace here, which was converted into a nunnery by his daughter Werburga, and subsequently destroyed by the Danes. The town of Daventry is four miles north west of the line.

Near the station the Holyhead road is carried over the line by means of an oblique iron bridge or gallery, formed of flat ribs bolted together and supported by side walls; this leads to a deep and extensive excavation, made in the midst of a beautifully diversified country, with trees here and there in groups, bearing the appearance of a well-wooded park. The ancient Watling Street is again passed under, by means of a skew bridge, and the line next pursues its course through a wood belonging to the Brockhall Park Estate, and under a neat embattled bridge which leads to the mansion.

An embankment of considerable extent succeeds, and the next work of importance is the Iron Suspension Bridge over the Grand Junction canal, at Buckby wharf. This is a stupendous structure, and requires particular notice. In laying out the levels of a line of Railway, canals are generally found to be formidable obstacles. In the case of a Railway, the most violent opponents are generally canal proprietors, for they consider that their profits are at once destroyed as soon

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as a line of road is opened through the same district, and many a hard battle has been fought with them in Parliamentary committees. Finding, perhaps, they have no chance of success, they next attack the mode of executing the proposed Railway, and efforts are made to render the works difficult of execution, and to keep the levels as much above the canal as possible. It is useless to point out to them that within a few yards of the spot in dispute, is one of their own insignificant bridges, about nine feet high from the water. Still they insist on having sixteen or seventeen feet under the Railway, otherwise the boats will not be able to pass along; at last, by absolutely fighting inch by inch, they allow a twelve or thirteen-feet "headway" for their boats, which is the case at Buckby wharf, where the Railway is about thirteen feet six inches from the surface of the water.

The bridge consists of two main ribs on either side, which are strongly braced together laterally by cast iron frames, bolted and keyed to cast iron segments, forming an arch of seventy feet span, on which the platform is hung; from these frames suspension rods descend and pass through the ends of iron ribs, to which they are secured by keys; the ribs lie transversely to the Railway, and upon them are fixed the chairs for supporting the rails, the spaces between the ribs being filled with cast iron gratings, through which the canal is seen from above. The main ribs rest in massive stone piers, with ornamental caps, and are held together longitudinally by several strong wrought iron rods, forming what has been called the "bow and string bridge." The value of lowering these bridges can only be appreciated by engineers, as every foot raised above a certain height frequently injures

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the gradients of the Railway, besides adding to the height of a long embankment (in this instance two miles long) and consequently increasing the cost of the works. These bridges have been introduced by Mr. Robert Stephenson, with great effect both as to cheapness of construction, and steadiness while the trains are passing over them; they have been tested and found to be more firm, and with less vibration, than any other description of iron bridge, whilst the elegance of the design is not less to be admired than its massiveness and security. Buckby wharf is a station of the Grand Junction Canal, and a place where much traffic is carried on, as the Grand Union Canal unites with it near this point, and at Braunston the Oxford Canal is also connected to it.

Leaving Long Buckby to the right, the line passes very obliquely over the Grand Union Canal, by an iron bridge of considerable extent; the ribs of which are flat, and rest upon side walls—the outer ribs being of the Grecian-Doric style of architecture, ornamented with triglyphs. Immediately after crossing this bridge, and the Roman Watling Street, we arrive at the Crick Intermediate Station, where there are booking offices provided as in those before described. An excavation formed in the Kilsby Ridge, through which the Kilsby Tunnel passes, is then reached: it is about half a mile long and fifty feet deep. This defile leads us to one of the most extraordinary works of the present day—the great tunnel through the Kilsby ridge. An inspection of this mighty effort of skill and ingenuity fills the mind with wonder and admiration.

The entrance fronts at either extremity of Kilsby Tunnel are similar in design and execution. They are built

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of stone, in the castellated style, but without embrasures, all the members being of an exceedingly massive character; and consist of one huge tower, with battering sides, and a bold plinth. The arch is encompassed by a projecting bead of stone, which cuts down upon the plinth; while the wing walls are thrown back, whereby the tower is made the principal object, and adds greatly to the effect.

WEEDON CHURCH AND VIADUCT.

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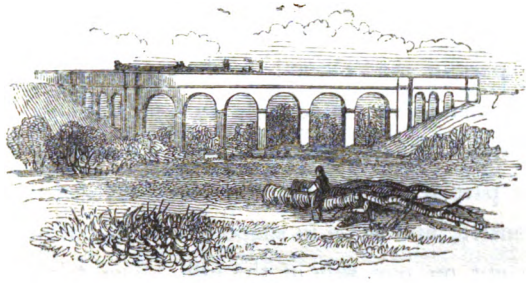

WOLVERTON VIADUCT.

CHAPTER XI.

THE Kilsby Tunnel is about 2,423 yards long, and was intended at first to be formed eighteen inches thick in the brickwork; but it was found necessary to increase this, in most cases, to twenty-seven inches. The whole has been built in either Roman or metallic cement.

The works were commenced in June, 1835, by the contractors; but such serious difficulties were met with, at an early stage of the proceedings, that they gave up the contract in March, 1836, and nearly the whole work has been performed by the Company. Previous to the commencement of the works, trial shafts were sunk in several parts of the

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line of the Tunnel, in order that the nature of the ground through which it would have to pass might be ascertained; and it was found to be generally lias shale, with a few beds of rock—in some places dry, in others containing a considerable quantity of water.*

In sinking the second working shaft, it was found that a bed of sand and gravel, containing a great quantity of water, lay over part of the Tunnel; and this was such a perfect quicksand, that it was impossible to sink through it in the ordinary way. By repeated borings, in various directions near this part of the Tunnel, the sand was discovered to be very extensive, and to be in shape like a flat-bottomed basin, cropping out on one side of the hill. The trial shafts had accidentally been sunk on each side of this basin, so that it had entirely escaped notice until the sinking of the working shaft.

Mr. Stephenson was led to suppose that the water might be pumped out, and that under the water thus drained the tunnel might be formed with comparative facility; this proved to be the case. Engines for pumping were erected, and shafts sunk a little distance out of the line of the tunnel. The pumping was continued nearly nine months before the sand was sufficiently dry to admit of tunnelling, and during a considerable portion of that time the water pumped out was 2000

* Organic remains at Kilsby are very numerous. In some parts of the excavation there is hardly a cubic inch without shells and other remains presenting themselves to the eye, and, as the earth taken out has been principally laid into spoil, there will be ample opportunities, for some time yet, for further examination, which would well repay either the scientific inquirer or the cabinet collector.

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gallons per minute. The quicksand extended over about 450 yards of the length of the tunnel, and its bottom dipped to about six feet below the arch.

In May, 1836, one of the large ventilating shafts was commenced, and completed in about twelve months. This shaft is sixty feet in diameter, and 132 feet deep; the walls are perpendicular and three feet thick throughout, the bricks being laid in Roman cement. The second ventilating shaft is not so deep by thirty feet. These immense shafts were all built from the top downwards, by excavating for small portions of the wall at a time, from six to twelve feet in length and ten feet deep.

In November, 1836, a large quantity of water burst suddenly into the tunnel, in a part where there were no pumps; it rose very rapidly, and in order to prevent the ground being loosened by it at the far end, where it was excavated, a rather novel mode of building the brickwork was resorted to. This was by forming a large raft, and on this the men and their materials were floated into the tunnel, and with considerable difficulty and danger performed their task.

All the difficulties were at last conquered, and the tunnel finished in October, 1838; but, of course, the expenses were increased to a very great extent. The directors felt it to be their duty not to restrict the proper outlay of capital, when satisfied it would secure the convenience of the public, the stability of the works, and the efficient management of the traffic; and they felt persuaded that a perseverance in this course, to the completion of the undertaking, would be found most economical in the end, and best calculated to ensure the permanency of that successful result which is now happily

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placed beyond the reach of doubt. The contract for making the Kilsby Tunnel was £99,000., and it has cost more than £300,000., or upwards of £130. per yard.

To give some idea of the magnitude of this work:—There were thirty millions of bricks used in it, which, at ten hours for a working day, if a man counted fifty in a minute, would take one thousand days to get through them all. There were above a million of bricks employed in the deepest ventilating shaft, and its weight is 4,034 tons. The weight of the whole tunnel is 118,620 tons; or it would freight four hundred ordinary merchant ships, of about three hundred tons each; and if these bricks were laid end to end, they would reach 4,260 miles. The quantity of soil taken from the Tunnel was 177,452 cubic yards.

The great ventilating shafts are perfect masterpieces of brickwork, and are found fully to answer the purpose for which they were intended, leaving the tunnel entirely free from any offensive vapour immediately after the transit of each train, and their magnitude can only be estimated by standing in the tunnel and looking upwards.

The passage through this mighty work of engineering skill and ingenuity leaves on the mind, even of those unacquainted with the ordinary difficulties of such an undertaking, a vivid impression of the rare talents of those who designed the work, and superintended its execution. These talents, however, will be more especially appreciated by those who are aware of the many and unforeseen obstacles which arose during its progress. To Mr. Charles Lean, the assistant engineer under whose direction it was completed, great credit is due for his skill and unremitting exertions, and for the great care he

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bestowed upon the men in the arduous and dangerous duties in which they were constantly engaged.

Leaving the subterranean darkness of the tunnel behind, the line then enters the excavation at the north side of the ridge, the slopes of which present the most picturesque appearance from the uneven manner in which they have been executed, and a long extent of Railway, perfectly straight, opens to our view; and then the road is continued through a diversified country, studded with sweetly secluded villages, which, from its undulating character, presents successive short cuttings and embankments, along which the majestic train of steedless chariots passes with the rapidity of the wind. The first bridge we have passed beneath, after quitting the tunnel, carries the turnpike road from Banbury to Lutterworth over the Railway, at an angle of twenty-eight degrees, and is the only example of its kind in this kingdom.*

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* The form of this bridge is that of a very flat segmental arch, the span being sixty-six feet, with a rise of only two feet six inches. It is composed of six cast-iron ribs or segments, two feet deep and one inch and a half thick, each of which are in two pieces, connected at the centre by bolts to the upper end of cast-iron king posts, five feet six inches deep; to the lower ends of each of which are connected, by eye-bolts, four strong wrought-iron tension rods, each four inches in diameter; the other ends of these rods fit into sockets, cast upon the girders at their springing, and are there strongly keyed up to their proper tension; each rib is connected to the other laterally, by cast-iron bracing frames, and the spandrils are pierced with openings, which give a lightness of appearance; a torus moulding runs through the whole length of bridge, above which is a plinth, supporting a neat iron railing with standards at intervals; the whole is covered with cast-iron plates, upon which the material which forms the roadway is laid, the width of it being seventeen feet; the piers on either side of the abutment are built of the Coventry stone, with a rock rustic face and chamfered joints, beyond which are curved wing walls terminating at the foot of the slopes. It will be seen, therefore, from the foregoing description, that the whole strength of the bridge depends on the tension rods,

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Arriving at the eightieth mile from London, we leave the county of Northampton and enter that of Warwick,—the former of which may be truly said to have contained the most numerous, as well as the greatest, engineering difficulties in the whole line; in fact, there are now few remaining works to notice, and those only of minor importance in comparison with the others already described.

The line soon crosses the Oxford Canal, about twenty feet from the surface of the water, by a substantial brick viaduct of three arches, the canal running parallel to the Railway, on the east side, for some distance. To the west, on the rising ground, is the village of Hillmorton, with its church and parsonage lying on the other side of the line; and to effect a communication between them, a bridge has been formed under the Railway. The embankment at this part is one mile and three quarters in length, and between thirty and forty feet in height; the amount of cubic yards of earth required for its formation being half a million. We then

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—for the arch itself is flexible; and should a heavy weight be unequally distributed over it, such as a regiment of soldiers marching over, it might, although in the slightest degree, have a tendency to deflect, but would be immediately again brought up to its proper level by the tension rods. A clear passage for the engines is left under the tension rods of sixteen feet six inches, which is the gauge of the *lowest* bridges on this line; and the square width of the bridge, between the abutments, is thirty-one feet. The appearance of the bridge from the Railway is that of a bow and string; it is highly creditable as a work of art and engineering skill, and is peculiarly applicable in situations where there is a want of height to throw over an arch of large span, which in this case has allowed the road to pass over level, and on the natural surface of the ground. It was made and erected by Mr. J. J. Bramah, of the Grosvenor Works, Pimlico; and the workmanship does infinite credit to him as an engineer. The weight of the ironwork is about one hundred and sixty tons, and the cost of its erection has been £9,000.

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pass through a short cutting, spanned by a fine bridge of three arches, and reach the Rugby embankment. The villages of Clifton and Brownsover are to the eastward; the latter enjoys the honour of having been the birthplace of Lawrence Sheriffe, the founder of Rugby School. The course of the Railway now bends sharply round to the west, revealing to open view the course and beautiful viaduct of the Midland Counties Railway, which runs from Nottingham, Derby, Loughborough, and Leicester, and joins the London line at this point. In the space of a minute the train passes over the road from Rugby to Lutterworth, and arrives at the RUGBY STATION, distant from London eighty-three, and from Birmingham twenty-nine miles. The landscape on all sides is remarkable for the diversified site of the ground, the rich succession of red fallows and green meadows, with the uplands clothed with majestic woods of the most luxuriant foliage. The embankment on which this station is situated is one mile long, and varies from thirty to forty feet in height—it contains 105,000 cubic yards of earth.

The bridge which crosses the Lutterworth road is an elegant structure, erected in the style of architecture of the reign of Queen Elizabeth. It consists of a flat gothic arch of cast iron, with ornamented spandrils abutting upon octangular towers of brick, with stone dressings, beyond which on either side are three smaller arches of brick, with buttresses between them, and the whole is surmounted with a parapet wall standing upon a bold stone moulding, which is carried through the whole length of the bridge. It is a beautiful specimen of workmanship; but the effect would probably have been much

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heightened if pinnacles had been placed on the tops of the buttresses, thereby breaking the long line of parapet wall at that part which, in some degree, at present offends the eye: the extra cost to the Company would not have been great, especially as it is reported that the Trustees of Rugby School,—which stands not far distant,—contributed £1000. towards its erection, in order to preserve the style of architecture of their own foundation. Close to the bridge, on the east side of the Railway, is a lofty chimney belonging to the pumping engine, which supplies the tank with water for the locomotive engines; and on the opposite side is the station house and booking offices. This building is erected in the Swiss style, with a large projecting roof, and is arranged so as to afford accommodation to passengers both arriving and departing. The booking offices are on the ground floor, and a staircase leads to the waiting rooms above on the level of the Railway, to gain which a large covered enclosure is passed under, while parties wishing to leave the Railway descend from the line by a separate staircase, so that all confusion is avoided.

There is a great deal more difficulty than would at first be imagined, in laying out a railway station. If those now existing had to be built over again, some change would be desirable: there are so many things to be amalgamated, and such various accommodation to be provided, that the business becomes exceedingly complicated. An easy approach for the engines and trains, without bad curves—a convenient situation with regard to the town—an easy access to and from the engine-house, and to the carriage sheds and repairing shops —a proximity to water—carriage facilities for getting coke

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and water—a convenient situation for the store department: these are a few, among many desiderata, which render it very difficult to make them all fall into the desired arrangement; but it may be said of the London and Birmingham Stations, that as much has been made of the ground as could, by any possibility, under the circumstances.

Every station is furnished with an alarum, to give notice of the approach of each train, and to summon the whole of the men to their appointed places. These alarums are so constructed, that a weight is wound up after they have performed their office which prepares them to perform it again. On seeing the forthcoming train has reached the proper spot, the policeman stationed at them pulls a trigger, and the weight begins to descend, ringing a loud gong-shaped bell by means of internal machinery. Bells are also hung so as, in a few seconds, to collect together the whole of the men belonging to the station for any required purpose.

The little town of Rugby lies about half a mile to the west of the line, occupying the rising ground,—with the "soft flowing Avon" in front, carrying its pleasant stream, as in days of yore, musically along, crossing here the eastern part of the county of Warwick. The historian of the county takes but little note of the place, except that it was "a mercate towne, standing chiefly of butchers," and for centuries it enjoyed this chartered market and its yearly fairs, undisturbed by the civil conflicts that desolated the country. But though it did not suffer the changes that passed over many other places in the kingdom, it never rose beyond its original condition till the sixteenth century, when a circumstance occurred which has given to it a national character. In the small

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obscure hamlet of Brownsover, which is seen to the right of the Railway, a short distance before we arrive at the Rugby Station, was born Lawrence Sherriffe, in very humble circumstances. Possessing something of the enterprising spirit of the hero of that little tale which has delighted so many youthful fancies, he entered London a needy adventurer, and though he never rose to be "Lord Mayor of London," he contrived to establish himself as a grocer of some eminence in the vicinity of Newgate Market, and became also one of the servants to Queen Elizabeth. He still cherished an affection for the place of his early association, and though he acquired his wealth in the metropolis, in the decline of life he returned to the neighbourhood of his humble birthplace, where he peacefully ended his days. At his death he bequeathed his "mansion," and a small estate in Conduit Close, near the Foundling Hospital, London, for the endowment of a school and four alms-houses; which though producing, in 1780, only a yearly rental of £116., by the increased value of property has become worth upwards of £5,000. per annum; and the school, from this comparatively small beginning, has arisen to be one of the most celebrated seminaries of the nation.

The present magnificent School at Rugby was erected in 1808, from the designs of Mr. Hakewill, and occupies nearly the same site as its humble predecessor. It is built of brick, with the angles, cornices, and dressings of the windows and openings, of Attleborough stone, in the Gothic style of the latter age of Henry the Eighth's time. It shews a splendid front to the south, pacing the length of two hundred and twenty feet, relieved by the graceful disposition of its parts and its elevated turrets, and is entered by a projecting square

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gateway tower, with octagonal turrets at the angles; and an oriel window, richly embellished with stained glass, lighting a spacious room which is appropriated to the library. The inner court spreads itself out into a fine area, of great length and width, with cloisters on the east, south, and west sides. The buildings on the north and south form the schools for the different departments of learning; but that on the west is called, by way of eminence, the Great School. It is in this, on the Wednesday in Easter week, that the prize compositions are recited; and the architectural beauty and elevation of the room are well calculated to give effect to such a classical scene. The chapel is separated from the school, and is a more recent erection; its style is in strict keeping with the edifice to which it belongs. The east window is enriched with fine stone tracery, and embellished with stained glass representing the offering of the Magi. Near to the altar is a beautiful marble monument to the memory of Dr. James, the late head-master, by Chantry. The interior of the chapel and the roof possess much of the cathedral character. There is an approach to the chapel from the school through an ample archway, and another from the public road. Attached to the institution are twelve almshouses, erected in the same architectural style, and the inmates wear the classical gown. The increasing consequence which the town has derived from the establishment of this celebrated school has produced a corresponding effect in its dimensions and improvement, and the completion of the Railway will give a new impulse to the spirit and prosperity of the place. The church is an ancient edifice, built in the early English style. It has undergone some alterations

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and additions, under the skilful directions of Mr. Rickman, and well deserves the inspection of the visitor.

A beautiful view of the Rugby Station is afforded in the approach by the coach road from Lutterworth, winding, as it does, through the most picturesque pastoral country that can be imagined, till the classic stream of the Avon, and the viaducts of the Midland Counties, and the London and Birmingham Railways, burst almost suddenly upon the view.

Proceeding onwards, an extensive view is commanded over the Avon Valley, the river winding along the eastern side of the line for several miles, imparting freshness to the adjoining country; and on rising ground, in the same direction, is the village of Newbold-upon-Avon.* We next enter a slight excavation; and at the eighty-sixth mile from London reach the Church Lawford Cutting, in some places thirty feet in depth, out of which half a million cubic yards of earth were removed, to form the Brandon Embankment which succeeds it. This raised road is two miles and a half long, in some parts thirty feet high, and carries the line of Railway across

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* "There are a number of rivers bearing the common name of Avon, in England, Wales, and Scotland; but this is that *Avon which is known wherever the English language is spoken*, by its association with the name of Stratford, and that again with Shakspeare's. This Avon, called the Upper Avon, to distinguish it from the Lower Avon (which comes down from Wiltshire, and flows past Bath and Bristol into the Bristol Channel), rises from a source called Avon Well, in the village of Naseby, in Northamptonshire; and after forming a boundary for some distance, between the counties of Northampton and Leicester, flows past Rugby, skirts the line of the Railroad at some little distance, passes under it, goes on to Warwick, Stratford-on-Avon, and ultimately joins the Severn, after a course of about an hundred miles. The stream of the Avon is gentle, and its banks interesting and beautiful, though occasionally flat."

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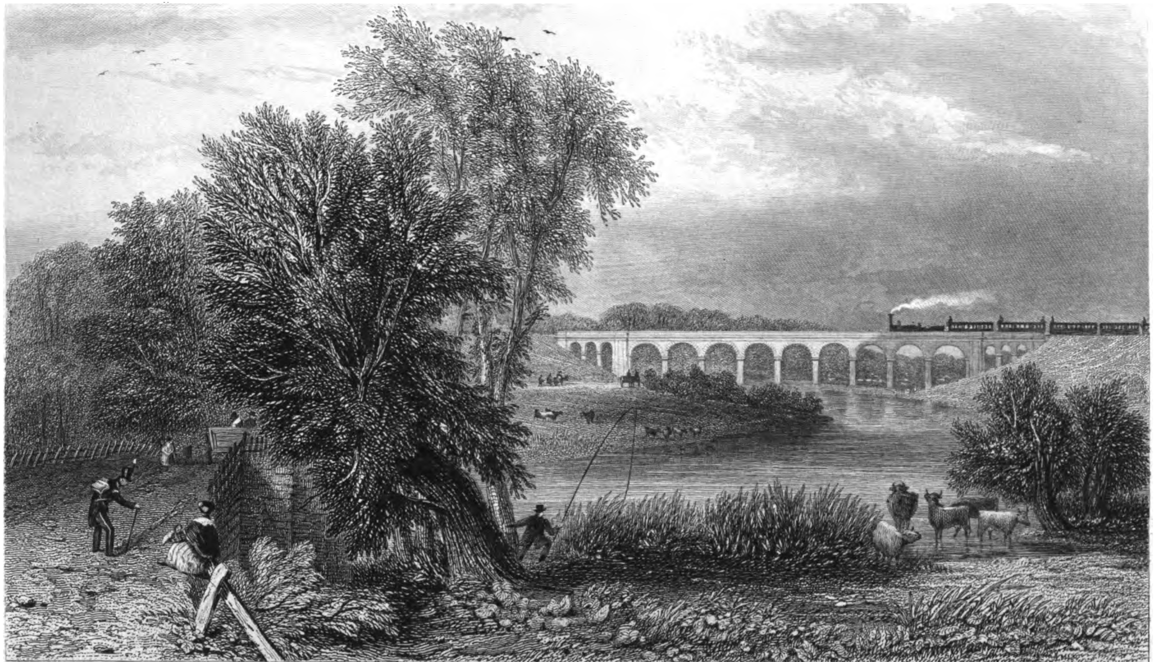

C. Radclyffe. W. Radclyffe.

THE AVON VIADUCT, *To J. H. Leesam Esq: this plate is inscribed.*

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the Avon Valley, passing over the Roman Fossway by a bridge, and the river Avon by a magnificent viaduct of nine arches, each of twenty-four feet span, and about twenty-seven feet above the surface of the water. The main arches are elliptical, the piers four feet thick, projecting from the face of the arches forming half octagons, terminated by caps at the springing of the arch; at either end are bold octangular piers continued to the top of the parapet, and the abutments are pierced with three semicircular arches of ten feet diameter, which rise out of the slopes of the embankment; a cornice extends through the whole length, and is surmounted by a parapet wall. The situation of this viaduct is remarkably beautiful, and it does not in the least destroy the effect of the scene along the valley, as the distant landscape is seen through its numerous arches. The road to Wolstone passes beneath one of the main arches, and the river Avon is conveyed through another by means of an inverted arch, which extends beneath three of the main arches. The embankment occasioned infinite trouble in its formation, from the treacherous nature of the soil, and it will be many years before the ground becomes perfectly consolidated. The Brandon Intermediate Station is at this point.

The geological characteristics become peculiar and interesting in this district. The red marl, or new red sandstone, is first intersected at the river Avon, which, at this place, appears to separate this formation from the lias shale, and the red marl continues to Birmingham. Till within a late period this formation has been generally thought destitute of organic remains, and it is now a doubt with many whether such really exist. There are, however, some facts which

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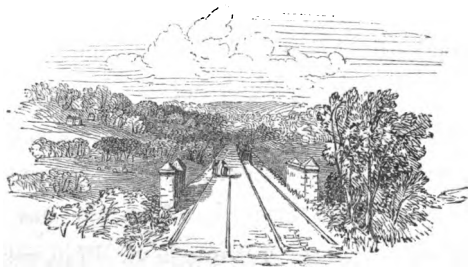
tend strongly to confirm a belief in the presence of these remains; at all events, the formation is not totally destitute of organic *matter*, inasmuch as a live toad was discovered in the deep cutting near Coventry, safely housed in a small smooth cell, in the centre of a mass of red sandstone rock perfectly solid, with the exception of the small cavity.

Fragments of silicified wood have also been found in the Hearsall Common Cutting, and in the road excavations in the neighbourhood of Coventry; but it is a matter of great doubt whether these belong to the red sandstone, or to the superstratum of diluvium which overlies some parts of the red marl. Mr. Gooch, the assistant engineer of the district, found some of this wood lying loose in the Hearsall Common Excavation, where the red rock extends almost to the surface.

Rapidly gliding along towards Coventry, we pass under a brick bridge of one arch, remarkable for the very acute angle at which it is built. It forms an angle with the Railway of twenty-eight degrees; the arch is thirty feet wide on the square, the skew face being sixty-three feet.



BOX MOOR EMBANKMENT.

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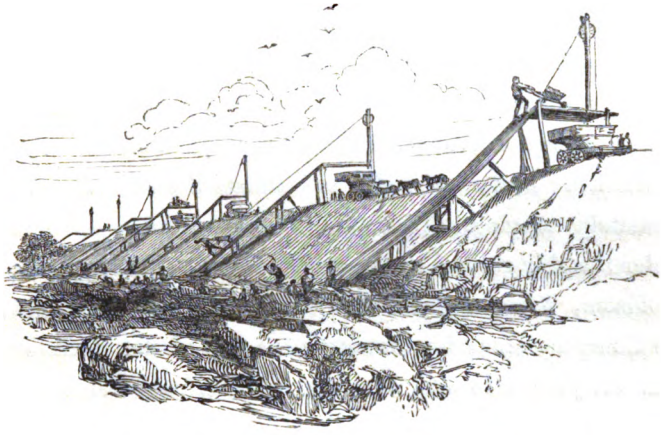

FORMATION OF EMBANKMENT, FROM SIDE CUTTING.

CHAPTER XII.

THROUGHOUT the journey travellers will have observed a number of policemen stationed along the Railway,—who not only prevent intrusion, but are charged with the important duty of keeping the road free of obstruction, and making signals as the train passes. The police are placed along the line at distances varying from one to three miles, according as local circumstances render it necessary. Each

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man has his beat and duties defined, and is provided with two signal flags, one of which is red and the other white: the white flag is held out when no obstruction exists; and, on the contrary, the red flag indicates that there is danger, and that the train must not pass the signal till it is ascertained that the cause of danger is removed.

Each policeman, also, is furnished with a revolving signal lamp, to be used after dark; which shows, at the will of the holder, a white light when the line is clear; a green one when it is necessary to use caution, and the speed of the train be diminished; and a red light, to intimate the necessity of immediately stopping. The whole of the police department is under the able control and superintendence of Captain C. R. Moorsom, R.N., a gentleman who has been connected with the Company since its formation, as one of the Secretaries. It is but justice to add, that the police arrangements on the London and Birmingham Railway are more complete than on any other line.

The next embankment we enter upon varies from thirty to forty-five feet in height; it is three quarters of a mile in length, and contains 364,000 cubic yards of earth. Those beautiful specimens of architecture, the much-admired spires of Coventry, particularly that of St. Michael's, now burst upon the view, towering above every other object. Proceeding onwards, the line crosses the insignificant river Sow, which runs in this place between high lands, by a substantial and elegant brick bridge of one arch, of sixty feet span, divided from three land arches on either side by two massive piers; the cornice is of stone, and extends the whole length of the bridge, which is two hundred and sixty-four feet, and is about fifty feet above the stream.

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On the right of the line as we approach towards Coventry, lies Combe Abbey, at once too distant to be distinctly seen, and resting, as its name imports, on the low lands.* This splendid mansion, owning for its present proprietor the Earl of Craven, is of the Stuart age in architecture, and is built on the ancient site of the first Cistercian monastery that was founded in Warwickshire. The style is in keeping with the religious foundation that preceded it; and the artist has well preserved and used in the modern edifice the ancient Norman arches and pillars, which form a fine corridor, ranging along the lower division of the mansion, hung with antlers and other rude emblems of free-warren. It is, however, in the magnificent suite of apartments, arranged alike for state and hospitality, and in the pictorial riches with which they are adorned, that the Abbey becomes the most distinguished. These apartments bear the several descriptive names of the Breakfast Room,—the North Parlour,—the Vandyck Room,—the Gilt Parlour,—the Beauty Parlour,—the Yellow Drawing Room,—the Cedar Room,—and the Great Gallery. The richest collection of rare original portraits, belonging to the unfortunate Royal House of Stuart, is to be found in Combe Abbey; as, perhaps, the character of its most chivalrous defender is associated with the name of William, Lord Craven, one of the foremost of the heroic men of the seventeenth century. Amongst the portraits is one of this distinguished nobleman, in armour; and his fine form and features display at once the warrior and the statesman, and realise the heroism

* *Cwm* in the British, and *Cumbe* in the Saxon, signify a low and hollow place.

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which led him to follow the fallen fortunes of his master into the Dutch service, and the calm firmness with which he braved, and the prudential arrangements with which he alleviated, the horrors of pestilence during the plague of 1665. Another portrait is that of Elizabeth, Queen of Bohemia, the daughter of James I. of England, painted by Hauthorst. The romantic admiration which Lord Craven bore to this extraordinary woman, who, by her fascinating beauty and rare talents, won the title of "The Queen of Hearts," might be the secret motive of his devotion to the cause of her husband. Though driven from the throne to which the unfortunate Frederick had been elected, and widowed in love and ruined in hope when she returned to England, she found consolation in the disinterested and constant attachment of Craven, to whom she became privately married. The accomplishments, virtue, and wit, of this fairest of James's daughters, made her the admiration of the English Court even in her old age; and the elegant verses of Wootton are attributed to her, which commence with these lines:—

"You meaner beauties of the nighte,
That weaklie satisfie our eies
More by your number than your lighte,
Like common people of the skies,
What are you when the moone doth rise?

The beautiful little church of Binley, erected by Lord Craven, which appears on the western border of Combe Park, is an object of picturesque interest. The interior is architecturally decorated, and embellished with an east window of stained glass, representing the Holy Family, by Mr. William Pecket.

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Newton Fielding.

Daniel Wilson.

THE SHERBORNE VIADUCT, NEAR COVENTRY,

and Bridge over the Holyhead Road.

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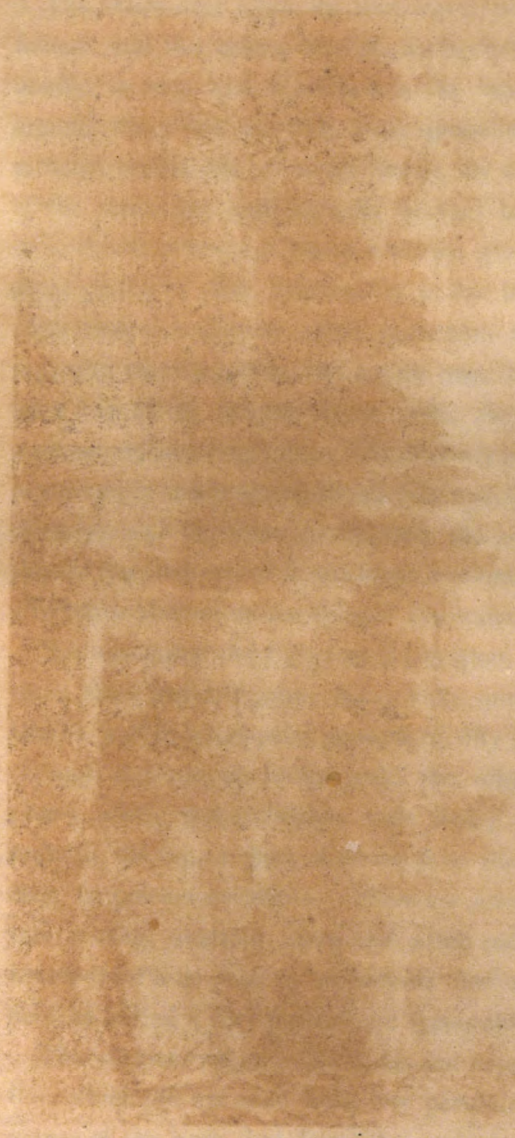

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The valley over which we now travel is rich in luxuriant foliage, and the tourist regrets, as he flies along, that he is unable to stop and contemplate the beauty of the scene around him; but onwards he is propelled, and in a few minutes crosses the river Sherborne, by a bridge or viaduct of the same size and character as that last described, and immediately afterwards passes over the great Holyhead road, at an angle of sixty degrees, by a flat iron bridge of one main arch of twenty-four feet span, with stone piers, which separates the road from the arches over the footway. This bridge is of the Grecian-Doric style, the outer ribs being ornamented with triglyphs. The Railway runs throug a track of ground in this neighbourhood that was formerly used as a nursery; and in order to improve the appearance of the slopes, the trees which it was found necessary to remove were afterwards planted on the sides of the embankment.

We now enter the Coventry Excavation, which, excepting three short embankments, is two miles and three quarters in length, and in some parts upwards of fifty feet deep, formed through the red sandstone rock, the sides being in some places nearly perpendicular, with strong stone fence walls built at the top, a short distance from the edge of the cutting, to prevent accidents. There are several bridges across this cutting, abutting upon the solid rock; one near the ninety-third mile-post, of seventy-six feet span, may be noticed as having a very picturesque appearance.

This contract was a troublesome and expensive part of the line, which did not arise from any peculiar difficulty in the nature of the work, but from the supineness and incapacity of the contractor. The work went on without either spirit

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or energy, and the time was rapidly passing away in which it was indispensable to complete it in connection with the other parts of the line, and the opening of the Railway would consequently have been delayed. In this dilemma the Company could do nothing but take the work into their own hands; and by great exertions, and a corresponding outlay, it was completed in time.*

Arriving at a very handsome stone bridge of one arch, which conveys the turnpike road from Coventry to Kenilworth and Warwick over the Railway, we reach the COVENTRY STATION, which is about eighteen miles from Birmingham. It is a neat Gothic building of brick, with stone dressings, provided with the usual first and second class booking offices, waiting rooms, and other conveniences, and a large enclosed area or departure yard, from which passengers descend to the Railway by two flights of steps.

To the north-east of the Station, a few hundred yards distant, is the city of Coventry, in which rise, with a grace and majesty rarely to be equalled, the "concurrent spires," as old Camden quaintly calls them, of St. Michael and Trinity. This ancient city, especially if its early records happen to be known, may be truly said to "invite the passing traveller to

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* The works in the division of the line from Rugby to Birmingham, were commenced under the superintendence of Mr. T. L. Gooch. This gentleman was also engaged by Mr. Stephenson to take the levels in first setting out the present line of road,—and has now the management of the Manchester and Leeds Railway, one of the most difficult engineering lines in the kingdom. The vacancy occasioned by his removal, was filled by the appointment of Mr. Forster as Assistant Engineer of the district, and under his direction the works so ably commenced have been carried on to their successful and satisfactory completion.

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stay." Its streets and thoroughfares, although still none of the best, are yet much improved since the "olden times," when the channels occupied the centre, and the pavements sloped from the sides, as is still very much the fashion, even in these modern days, on the continent. But it is to the historian and the antiquary that Coventry presents the most attractive interest; and we may here perhaps be permitted to remark, that the localities of the county of Warwick, which spread themselves around from this Station, are well worth the trouble and expense of a journey, and will justify us in a more lengthened description than would otherwise be consistent with our work. Coventry, in its palmy days, was styled "the Chamber of Princes," and is remarkable for having once possessed a learned bishop in the 13th century, whose pretended visions and apparitions caused it to be recorded in the pontifical decrees of that period, "that he was not in his right wits;" and a civic magistrate, three centuries afterwards, whose wit *was* in its right place, when he seized the opportunity of paying the most graceful and acceptable compliment to one of the vainest and proudest of our sovereigns, as will be seen in the following brief colloquy. When the "Virgin Queen," as she was somewhat oddly styled, considering her private history, visited this place, in her progress through the kingdom in 1665, she was met by a grand procession of the city authorities, and entertained with splendid shows and pageants. At the conclusion of the ceremonies the recorder advanced, and presented a purse, supposed to be worth twenty marks, containing £100. in angels; which the queen accepting, was pleased to say to her lords—"It is a good gift; one hundred pounds

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in gold; I have but few such gifts." To which the mayor answered quickly—"If it please your grace, there is a great deal more in it." "What is that?" said she. "The hearts," replied the mayor, "of all your loving subjects." "We thank you, Mr. Mayor," said the queen; "*it is* a great deal more, indeed." It is needless to say that her majesty was as much pleased by this well-turned compliment, as by the substantial nature of the gift. Coventry was the very centre of royal visits, and was even occasionally the residence of some of the British princes, from Canute the Dane to James the Scot. It was twice the halting place of the unfortunate Mary, in her passage from one prison to another; and it was subsequently honoured by the presence of the beautiful Elizabeth, afterwards Queen of Bohemia, and the accomplished and gallant Henry her brother, the last and the bravest of British knights, with whose premature death expired the tilt and tournament of the feudal age of England.

Coventry records many important and interesting events in her history. In the reign of Richard II., Gosford Green, then a wide unenclosed waste, was the scene of the intended combat of the Dukes of Hereford and Norfolk. The king attended in person, surrounded by a splendid retinue of peers, and by above ten thousand persons in harness. Our old chroniclers are absolutely in raptures at the flutter of silks and velvets, the gleaming lances, and the brave devices that streamed over this field of the chivalry of England. The lists were prepared; the combatants had already appeared at the barriers, and "donned their devoirs." All eyes were turned in eager expectation to the scene of mortal

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strife, when the king interposed, dismissed the combatants, and, by a singular act of arbitrary authority, condemned both these noblemen to banishment,—Norfolk for life, who died soon after, at Venice, from chagrin and mortification; and Hereford for ten years, who long before the expiration of that time returned to England, not as an exile, but in arms, the Henry of Bolingbroke, who afterwards became the fourth of that name that filled the throne of England. In the reign of this monarch was held, at Coventry, the celebrated *Parliamentum Indoctorum*, or lack-learning parliament, when the churchmen claimed an equivalent for the tax proposed to be levied upon the laity, "in the masses and prayers which they offered day and night to implore God's blessing for the King and all that served him." To which very fair reasoning Sir John Cheyne replied, with a severity rather singular for those times,—" that he valued not the prayers of the church." In little better than half a century afterwards, another Parliament was held in this place, while the civil wars of the Red and White Roses raged in the kingdom, which received from the Yorkists the significant title of *Parliamentum Diabolicum*, from the acts of attainder which were then passed against the faithful followers of *la Rose Blanche*.

The architectural embellishments of Coventry, belong to the most splendid portion of its early history, as their remains form the most interesting attraction to the visitors in these modern times. They necessarily partook of the character of the age in which they arose, and comprised edifices and buildings for religious purposes, and strongholds for defence against the aggressions so frequent in the feudal age. The religious house for nuns, " of which a holy virgin, named St. Osburg,

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had been sometime Abbess," was destroyed in the early part of the 11th century, by Canute, and on its site arose a splendid Benedictine monastery, reared and richly endowed by the piety of Leofric, fifth Earl of Mercia, and his celebrated wife, the Lady Godiva. Soon after the Norman Conquest, Ranulph, Earl of Chester, erected a castle here of extraordinary strength. Settlements of Grey Friars and White Friars speedily followed, and then might be seen what is humorously recorded in the old song:—

> " There was a Castle for men of arms,
> And Cloisters for men of the gown ;
> There were Friars and Brothers, with various others,
> Though not any whose names are come down."

In the reign of Edward III. and his successor, the city was surrounded with massy walls, in some parts nine feet in thickness, and three miles in circumference, and surmounted with thirty-two towers. These fortifications took forty years for their completion, and remained in their strength, during the conflicts of the three following centuries. In the reign of Charles II. they were completely dismantled, and this work of prodigious and protracted labour was levelled with the ground in the short space of three weeks and three days.

The spire of St. Michael's Church, which rises upwards of 300 feet, still attracts the eye of the traveller with the same unequalled symmetry and beauty it possessed when it was first raised in the latter part of the 14th century.* The body of the Church was erected in the time of Henry VI. when Coventry might be said to be at the height of its glory, and is

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* This steeple of St. Michael was built at the charge of William and Adam Botoner, who were several times mayors of Coventry.

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in the best style of Gothic architecture, distinguished by its elegance, solemnity, and the felicitous adaptation of its several parts. To the south of St. Michael's Church, stands St. Mary's Hall, which was originally erected in the early part of the 15th century, for the Guilds of this city, though it is now used for the purposes of its civic authorities. There still remain in this ancient edifice, the most interesting specimens of its former magnificence and importance, and architectural and decorative evidences illustrative of the successive ages through which it has passed. The churches of Trinity and St. John, possess many claims to the research of the antiquarian, which by their remarkable peculiarities will well repay the time and labour he may expend in their examination.

Coventry was famous in former times for the manufacture of cloth, caps, and bonnets; afterwards woollen and broad cloths, and a kind of blue thread, of which the art is now irrecoverably lost; to this succeeded the fabric of camblets, shalloons, and calamancoes; and latterly of ribbons and watches, for which it still retains the highest reputation.

The pageants and shows, and religious dramatic mysteries, principally performed by the Friars and members of the different Guilds, form a portion, and not an uninteresting one, of the history of the place.* These were exhibited on *Corpus Christi* day, and other particular occasions, on a moveable vehicle, very much like the travelling cart of Thespis, from which he entertained the Grecian multitudes that crowded to the Olympic Games, and they constituted the source of attrac-

* These have been most elaborately and ingeniously illustrated in Mr. Sharpe's Book of the Coventry Mysteries.

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tion to this city, from all parts of the kingdom in its earliest age, and in no small degree contributed to its importance.

> "The state, and reverence, and show
> Were so attractive, folks would go
> From all parts, every year, to see
> The pageant plays at Coventry."

Of these there now only remains the triennial procession connected with the fabled legend of the Lady Godiva's affection for the ancient inhabitants of this city. A courtezan from the neighbouring town of Birmingham, arrayed in a flesh-coloured dress, not unfrequently performs the historical part of the exhibition. The modesty of the ancestors of this city is attested by the history of Peeping Tom, who projects his solitary effigy from the corner of the High-street. The moderns of this refined age, however, keep their eyes wide open when these occasions occur, and hosts of people from the surrounding neighbourhood hasten to the city to witness the discreditable scene.

The visitor is desired to shape his route amongst the interesting places that may be said almost to cluster near to this part of the line, by way of Kenilworth, which is approached by one of the most enchanting roads that is to be found in the midland districts of "merry England," and lies only at the short distance of five miles to the left of the Coventry Station.

Kenilworth Castle, in its solemn and mysterious ruins, is the great source of attraction to this spot. Its history includes the general incidents which belong to baronial edifices reared in the feudal ages, with some remarkable circumstances which throw over it an interest surpassing that of almost any

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other place in the kingdom. The bulwarks of the fortress, and the walls of its neighbouring monastery, dedicated to St. Augustine, were coeval in the time of Henry I. At first it comprised only a solitary tower of great strength, but in the succeeding reigns of John and Henry III. large sums were expended to render it more impregnable. In Edward the First's time, the "Knights of the Round Table" were assembled within its walls, attended by a corresponding number of ladies, whose gay attire is recorded by the old chroniclers in the fact that they wore, for the first time, "silken mantles." A splendid tournament was held, to which many a gallant knight repaired, to break a lance in honour of his ladye-love. The banquet and the dance followed upon these deeds of arms. An event of another kind took place in the Second Edward's time, when it became his prison, and the scene of this hapless monarch's deposition. The most splendid additions were made to this magnificent fabric by John of Gaunt, into whose family it passed, styled by the Bard of Avon "time-honoured Lancaster,"—and by the Earl of Leicester, who afterwards succeeded to the possession, and which, in this hour of its desolation, are known by the names of Lancaster's and Leicester's buildings. It was in the high days of this latter nobleman that the celebrated pageant took place, in honour of Queen Elizabeth, that has become matter of pleasant history, and which has received so much embellishment from the pen of the Northern Magician. It was on this occasion that "the good-hearted men of Coventry petitioned that they might renew their old storial show" of Hock-tide,—a favourite play, composed in commemoration of the extinction of the Danish power in

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England, at the death of Hardicanute. It is recorded that her Highness "laughed right well" at the representation, and bestowed upon the performers two bucks and five marks in money, to make merry withal. Kenilworth Castle was true to the cause of Charles in his wars with the Parliament, and received the reward of its fidelity in its entire demolition by the soldiers of Cromwell. The Protector divided the lands of this extensive domain among his officers, who sacked the castle and pulled down its walls for the sale of the materials. Thus perished this splendid fabric; not amidst the sound of trumpets, nor by the conflict of a host; but by the petty power of sordid hands, "bannerless, and without one hero to sigh over its destruction."

> "No turret, battlements, or tower,
> No porch—but all is drear decay,
> No court-room, banquet-hall or bower,
> No—time's keen scythe swept all away."

Many a pilgrimage is made to moralise amidst the superb ruins of Kenilworth Castle, and sufficient yet remains to mark its strength, extent, and architectural beauty. The Warder's tower is in good preservation, and is inhabited by a substantial farmer. The walls are still discoverable all around its ample area. Several of the towers of the main building may yet be seen. The large banquetting room, measuring eighty-six feet in length, with spacious windows, ornamented with the richest stone tracery, is still described by the remaining external walls, forming part of those magnificent buildings which owe their creation to the splendour and taste of Elizabeth's favourite Leicester. The most luxuriant ivy spreads itself over the face of these venerable ruins, and

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overtopping, in the growth of ages, its mouldering walls, flings its wild festoons from angle to angle in the triumph of undisputed possession. The flaunting evergreen singularly harmonizes with the decaying fabric over which it spreads itself,

"All green and wildly fresh without, but grey and worn beneath;"

and in the mellowing hues of a summer's setting sun, presents a scene as rich in natural beauty and picturesque attributes, as it is in melancholy associations and salutary moral lessons. Beyond the walls, to the south of the castle, was the place "where wild brookes meeting together make a broad poole among the parkes," as the old chronicler describes it, and from a floating island on this splendid lake, the Royal guest was welcomed to the "princelie pleasures" of Kenilworth, by the "Lady of the Lake and her Nymphes." The Castle in the day of its pride, looked out upon a park and chase of sweeping extent, upon broad lands and spreading manors, over which an eagle might almost stretch her pinion for a summer's day together; "the like both for strength, state and pleasure not being within the realm of England." The waters of the lake were drained by Cromwell's soldiers, and its channel now forms a fertile meadow, measuring upwards of a hundred acres; the park and chase were desolated, and the rich manors quartered amongst a hungry and rapacious soldiery. The secret attraction of Kenilworth is in the power its ruins possess over the imagination and memory, in the enchantment it offers to the fancy, and in the food it supplies for stern reflection. If the visitor, when fairly within the gates, be permitted to traverse its ruins alone, he will not be allowed to approach its entrance without a crowd of merry-faced and

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determined young beggars, who have at their fingers' ends all the names to be found in the Northern Wizard's novel, and he will be fain to give something "for the love of Amy Robsart and the faithless Leicester," or really to rid himself of these importunate lazaretto.

Kenilworth is a pleasant little town, and has quite the air of a rural village of the first respectability. A circle of well built houses, detached and interspersed with shrubs and trees, skirt the elevated ridge of the little vale, at the north end of which stand the castle ruins. On the descent into the hollow may be seen the Gothic gateway, and what else remains of the ancient monastery which Geoffrey Clinton founded for "Chanons regular." Not far from the castle is the church, an ancient Gothic structure, the principal entrance to which is through a fine Saxon arch, in excellent preservation.

Stoneleigh Abbey, which lies still farther to the left of the line from Coventry, is one of those secluded spots of English landscape scenery which are rarely met with, except in the midland counties. It combines the rich and quiet beauties of a pastoral country; and from the fertile valley in which it appears to rest in profound peace, ascend the green slopes of gently swelling hills, relieved by groups of spreading trees gracefully composed, and girt, in its extreme boundary, by ancient woods, the growth of ages long since past. Through the length of this domain flows the Avon, that river of romance, consecrated by the genius of England's brightest poet, rolling its affluent waters along, clear, sparkling, and transparent, before they become stained by the murky channel which receives them at Leamington Priors. In such a lovely spot as this did the Cistercian monks of the

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twelfth century rear their hallowed temple; but this dwelling place of the holy brotherhood, after remaining for four centuries, was sequestrated in the time of Henry VIII. The Abbey was bestowed by that profligate monarch upon Charles Brandon, the proud Duke of Suffolk, and was afterwards purchased by Sir Thomas Leigh, alderman of the city of London, in whose family it has ever since remained. The present possessor is Chandos Leigh, Esq. a man of refined taste and poetical talents, whose unassuming habits and benevolent feelings seem to be in unison with the gentler beauties of this delightful place. The Abbey contains some fine pictures, amongst which are several *chefs d'ouvres* from the easels of Paul Potter, Canaletti, and our own Gainsborough. Old Camden throws some additional antiquarian interest into this place by stating, in his own quaint way, that "just over against this Abbaye stood, in old time, a Castle upon Avon, called Stoneley Holme, which was destroied when the flaming broils of Danish warres, under King Canutus, caught hold of all England."

The Church of Stoneleigh, with its "ivy-mantled tower," is a Gothic building, and contains some monuments of great interest belonging to the Leigh family, amongst which is that of Alice, Duchess of Dudley, the wife of Sir Robert Dudley, a man of rare attainments, and her daughter.

Leamington, a little hamlet, as it was once called, on the banks of the Leam, "a small brooke that wandereth through this part of the shire," reckoned in the great Book of the Nation, of not more than two hides* in extent, and of the

* About 200 acres.

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yearly value of four pounds, was once the property of the last Saxon Earl of the powerful house of Warwick. It passed afterwards into the hands of Geoffrey de Clinton, and was given by him to the holy Priors of Kenilworth, from whom it became vested in the Crown at the dissolution of the monasteries in the time of Henry VIII. It was granted in the reign of Elizabeth to the brave and virtuous Ambrose Dudley, Earl of Warwick. At present, the manorial rights and part of the land within the parish, belong to the noble family of Aylesford.

So much for its ancient history. Not more than half a century ago, Leamington retained its original name, with all the humble attributes of a country village. It is true that a discovery had been made nearly a century before, of the sanatory springs which it contained, for old Fuller, in his *History of the Worthies of Great Britain*, writes, with his customary quaintness, that "at Leamington there issue out, within a stride of the womb of the earth, two twin springs, as different in taste and operation as Jacob and Esau in disposition, the the one salt, the other fresh." This attractive place, which has now attained to the dignity of being styled "the Spa of Warwickshire," is indebted to later and, in some respects, humbler individuals for the publicity of its claims to attention, and the celebrity to which it has since advanced. Benjamin Satchwell and Mr. William Abbotts, whose tombstones in the churchyard immediately opposite the Bath Hotel record their patriotism, laboured hard in their day to make known the extraordinary virtues of these healing waters, and to extend and afford their benefits to the infirm and diseased poor. The former, in an especial manner, by his "uncouth rhymes" and

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essays, published periodically in the surrounding newspapers, excited great public attention, and drew many a wanderer in search of health to these life-giving springs. The latter, in connection with his fellow-labourer in the good cause, was the first founder of the Leamington Spa Charity.

Dr. Lambe, in the *Manchester Memoirs*, published a synoptical table of these springs, and a full staff of the medical profession soon followed, and established this place as the head-quarters of pharmacy. None, however, lived to attain the reputation, or, as it is reported, to acquire the splendid fortune, of Dr. Jephson, the present celebrated physician of Leamington. They, like the first settlers in a new colony, had the satisfaction, by their labour and patience, to continue to attract additional settlers to the spot; and the Doctor has had the still greater satisfaction of reaping the harvest of their labours, which, it is said, he well deserves, by his professional skill and general urbanity, and especially by his attention and benevolence to the poor. On the heels of the medical staff pressed a host of artists and artisans, all eager to embellish the rising favourite; and Leamington, the hamlet of former days, with its straw-covered cottages, has arisen, like Aladdin's palace, into all the consequence, splendour, and architectural embellishment of the most fashionable watering-place, and promises soon to rival any of the first cities of the Empire.

Scarcely any one can have any pretensions to public notice at this modern Spa who has not made the acquaintance of the good Doctor, whose patronage is a passport to the best circles. And we may say also, no one can possess any claim to the character of an amateur of the Fine Arts, who has not paid

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a visit to the Studio of Mr. Walker,—an artist of first-rate talent, whose pictures, like those of his eminent countrymen, Wilson and Gainsborough, will probably never be estimated, in proportion to their rare merits, till the genius which produced them has passed away for ever into that oblivious land "unpierc'd by human thought." Dr. Jephson possesses a splendid picture from the easel of this artist, representing Kenilworth Castle in its perfect state, at the time of the Vestal Queen's visit to that magnificent place, from which a very finely-executed engraving has been made in lithography. Two paintings, much larger than the cabinet size, have just been completed by Mr. Walker,—the Garden of Eden, and Homer reciting his Iliad in one of the Greek cities at sun-set, —which possess extraordinary beauty and talent.

There is no lack of entertainment in Leamington for all classes of her Majesty's subjects. Splendid hotels open wide their inviting doors in almost every street, and promenades, theatre, and ball-rooms, offer their mediatory charms to dissipate *ennui*, and render still more silent the foot-falls of Time. Churches and chapels for every sect and variety of the Christian name abound in this place.

Leamington is the centre of the Warwickshire Hunt, and the costumes of gallant sportsmen, scarlet and Lincoln green, gleam along the spacious streets, and create quite a flutter among the languishing damsels that hold themselves in readiness to fall in love with *les chasseurs braves*. The hunting season makes this a place of fashionable resort during the winter.

The neighbourhood of Leamington is, in an especial manner, attractive for the meek and quiet beauties of its pastoral

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scenery, and it is rich in the associations which belong to architecture, history, and poetry. These are the attributes which give such a character to the Spa of Warwickshire, and furnish allurements to the gay, and reflection to the grave; that spread over its surrounding fields tribes of loiterers and laughers; and gather round its castles and ruins, and along the course of its river, the children of Fancy and the Arts.

Warwick is a drive of about two miles from Leamington; and if approached by the old road, makes the visitor acquainted with the "antique towers" of its venerable castle very soon after he leaves the latter place. The towers of Cæsar and Guy rear their lofty and time-worn turrets far above the surrounding woods, like the giant sentinels of the place, no longer watching the approach of hostile troops, "clad in burning arms," but absolutely alluring its numerous visitors to an inspection of the finest baronial residence of which England can at the present time boast.

On approaching the castle, the road leads over a handsome stone bridge, of one arch;* from which, perhaps, the finest view of the fortress is obtained, reflecting its massy lengthened line in the silver waters of the Avon. Close to the castle are the remains of the ancient bridge, whose singular ruins seem to be left in solemn evidence of its antiquity.

Warwick Castle rises from the north bank of the Avon, and occupies a rocky elevation above the river, with the town lying close to its walls. Its history reaches as far back as

* In a diary of the late Earl is the following memorandum relating to this bridge:—"I built a stone bridge, 105 feet in span; every stone from 2,000 to 3,000 lbs. weight. The weight of the first tier on the centre was estimated at 100 tons. I gave the bridge to the town, with no toll on it."

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the times of good King Alfred, to whose daughter, the Lady Ethelfleda, the kingdom of Mercia, of which the county of Warwick formed a part, was given. The castle has undergone many changes during the barbarous conflicts of the feudal age, and was the subject of siege and attack, during twenty-one days, in the time of the wars between Charles and his Parliament, of which the traces are still visible. The march of Lord Brooke from London, with a number of the Parliament's forces, on whose side he had ranged himself, broke up the siege, and an obstinate battle restored to him the quiet possession of the castle. This was the last time the walls of the old fortress sustained any hostile assault. The lofty towers now look out upon a scene of almost unequalled beauty and repose, not likely again to be disturbed by such unnatural broils during the progress of ages.

"No hostile banner waves on high;
No warder's challenge—friend or foe?
No surly porter guards the gate;
No bugle sounds at porch below."

The visitor is detained at the outer lodge to look at the enormous bowl, about the size of an ordinary domestic copper, which is shewn as the porridge pot of the celebrated Guy, Earl of Warwick, with the spear, and other warlike weapons of that renowned champion. A long winding way, cut through the solid rock, and trellised with rich luxuriant ivy, conducts to the great gateway, flanked by two towers, which opens into the inner court. The entrance hall is an immense apartment, extending seventy feet in length, with a width and height of corresponding proportions, bearing a richly-carved oak ceiling, and is, on the north side, hung with curious ancient armour, and other rare specimens of a warlike age. The state apart-

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ments, as they are called, are emblazoned with a rich collection of pictures, containing portraits by the pencils of Titian, Rubens, Vandyke; and pictures from Vanderwerf, Murillo, Paul Veronese, Salvator Rosa, Zucchero, and others. The portraits, which are undoubted originals of the masters whose names they bear, possess peculiar national interest. The portrait of Anne Boleyn, by Holbein, is a *chef d'œuvre*, which seems to reveal, in the beautiful repose that spreads over her face, some little of that melancholy which is connected with her undeserved fate, and is expressed in the lament, written by "a very judicious antiquary," as Sir John Hawkins styles him.

"O Death! rock me on slepe,
Bring me on quiet reste;
Let passe my very guiltless goste
Out of my careful brest."

A very spirited sketch of Van Tromp seems to exhibit the saucy admiral in such a humour as that when he threatened to sweep the Thames with a broom at his mast head; or when he took his mistress a cuff on the ear, in the true style of Dutch gallantry, for finding fault with an ill-fashioned leg he had made her.

There are other portraits of great interest, including those of Lord Arundel, by Rubens,—the Earl of Warwick, commonly distinguished by the title of the king-maker,—Lord Strafford, whose fidelity and melancholy fate has drawn a sigh from many a British breast,—Lord Essex, one of the favourites of Elizabeth,—and the eccentric son of Lady Mary Wortley Montague, in a superb oriental costume. The most interesting of them all, however, is Vandyke's Charles I., on horseback, which is most judiciously placed for observation and effect at the extreme end of a long narrow passage, and being

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thus relieved from all other objects, enjoys the importance, and receives the attention, it deserves. The force of the painter's mind and art seems to be thrown into this picture, and they are seen in the firm tone of colour, the strong lights and shadows, the heroic attitude of the monarch, and the proud bearing and excellent drawing of his gallant charger. The royal countenance has the stamp of true nobility upon it, mingled with its characteristic melancholy; and notwithstanding the pride and perverseness so peculiar to the Stuart race, the visitor, while contemplating this picture, would be ready to say with old Lilly,—" For my part I do believe that he was not the worst, but most unfortunate of kings."

It is one of the most vexatious circumstances connected with the inspection of the treasures which are collected in Warwick Castle, that the visitor is hurried from the hall, with its rude and rare antiquities of warfare, to the state apartments, with their splendid pictures, ancient furniture, and gorgeous cabinets,—their precious marbles, scagliola tables, and curious porcelain and other articles of *vertu*,—the state bed rooms of Queen Elizabeth and Anne,—and the great armory, with a rapidity that admits only of a glance at, and not a satisfactory contemplation of, these subjects of supreme interest and taste. The oft-told and formally-repeated tale tires upon the ear of the visitor, as much as it seems to weary the tongue of the *cicerone*, and the prevalent feeling with the one is the fear of trespassing upon the time of the other, whose anxiety is apparent to dismiss one party in order to make room for another.

The visitor must not leave Warwick Castle till he has satisfied his eyes with a view of the grounds, which are laid

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out in a style of great magnificence and taste; and especially till he has well examined the cedars of Lebanon, which are here in great numbers, and of extraordinary growth and age, —some of which, indeed, are so venerable as to be coeval with the noble family to which they belong. The old gardener will be gratified to conduct the visitor, inasmuch as he anticipates the *quid pro quo* for his attentions, to the conservatory, to inspect the beautiful Grecian vase of Lysippus, which was exhumated out of the ruins of Adrian's palace at Tivoli, where it had been buried for ages, and brought to England by Sir William Hamilton. This beautiful specimen of ancient sculpture is of white marble, and is encircled with intertwining vines, of which the stems form the handles. The spaces between the fruit and foliage are decorated with antique heads. A panther's skin, with the head and paws—the thyrsus of Bacchus—and the lituus of the augurs, complete the embellishments. This splendid vase is sufficiently capacious to hold 163 gallons.

Every visitor, on leaving this interesting edifice of former times, will be ready to take up the poetical farewell once addressed to it:—

> "I leave thee, Warwick, and thy precincts grey,
> Amidst a thousand winters still the same;
> Ere future tempests rend thy last sad leaves away,
> And from thy bowers the native rock reclaim."

The church of St. Mary is a magnificent structure, and possesses a chancel in its original state, architecturally enriched in the best style of English architecture, and containing a fine altar-tomb to one of the Earls of Warwick. The Beauchamp chapel, as it is called, is an elegant and highly-enriched edifice; and, in its architectural embellishments,

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is said to be very little inferior to the chapel of Henry VII. at Westminster. This chapel contains the tombs of the celebrated Earl of Leicester and his Countess; that of Lord Warwick, of whom the Emperor Sigismund said—"If courtesy itself should die, it must revive in him;" Lord Brooke, the friend of Sir Philip Sydney; and many others, beautifully sculptured and heraldically emblazoned. In 1694 a dreadful fire had nearly consumed this splendid edifice, but happily this part of the building remained unscathed.

The county hall is a substantial building, in the Grecian style, with a façade embellished by Corinthian pilasters, and a central triangular pediment supported by columns of the same order. On the site of the ancient Priory of the Holy Sepulchre is an excellent modern edifice, of the age of Elizabeth, built from its old materials; and the Priory gardens, which retain their ancient name, are worthy of inspection. Close to the town is the venerable building, still in good preservation, which the Earl of Warwick erected as an hospital for strangers and pilgrims, dedicated to St. John the Baptist. It is at present occupied as a lady's school, and stands on the new road to Leamington.

Guy's Cliff is only a pleasant ride of little better than a mile from Warwick. The legend which is associated with this spot renders it an object of general interest. It is described by the historian of the county as "a place of so great delight, in respect to the river gliding below the rock, the dry and wholesome situation, and the fair grove of lofty elms overshadowing it, that to one who desireth a retired life, either for his devotions or study, the like is hardly to be found." The river, of which Dugdale makes mention, is the

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soft-flowing Avon, which washes the base of the cliff, and then winds along this valley of romance, in all the serpentine meanderings of its ancient channel. In the time of the early Britons, it was chosen by one of the first Christian bishops as a place for retirement and devotion; and four centuries afterwards the repentant Guy fixed his abode here, to discipline his soul, after his wandering and knight-errant life, as he thus records himself, or some one else for him:—

> "Here with my hands I hew'd a house,
> Out of a craggy rock of stone;
> And lived like a palmer poore,
> Within that cave myself alone."

The cave where this "English Hercules" dwelt, and was daily fed by the hands of his unsuspecting Countess, the fair Phillis, is still shewn. On this rock the Earl of Beauchamp erected a chapel, and placed within it a gigantic statue of the renowned knight. The statue is still preserved, though somewhat mutilated, and the chapel yet remains in good repair, though dismantled. This beautiful domain came into the family of its present possessor, the Hon. C. Bertie Percy, by purchase, in the early part of the eighteenth century, and a handsome mansion was at that time built upon this celebrated cliff, which has received considerable additions and improvements from time to time. Nearly opposite to Guy's Cliff may be seen Blacklow Hill, a rocky eminence, girdled and crested with a rich plantation of forest trees. In the hollow part of the rock, which appears to have been used as a quarry, is the spot where Piers Gaveston, the haughty favourite of Edward the Second, was beheaded, without the form of a trial, by the Earl of Warwick, "the black dog of Arden," as Gaveston

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had contemptuously called him, and the confederated barons.* Four slender upright shafts resting upon a pedestal, surmounted by a flat stone and elevated cross, stand upon the summit of the rock in commemoration of the event.

The Avon winds not along as a useless stream through these enchanting grounds, but employs the force of its current in turning a mill, which is built upon its banks, in the rich valley below. This mill forms one of the most picturesque objects in the scene at the present day, as it has done for ages, since its first erection before the Norman Conquest.

The mansion contains many subjects of interest, amongst which are the busts of the Kemble family, executed by the late Mrs. Siddons, who was for some time a resident here. In several of the rooms are some fine pictures, and many from the pencil of one of the members of this respectable family, Mr. Bertie Greathead, a highly-gifted young man, who died at Vicenza, at the early age of twenty-two. During the short peace with France, after the treaty of Amiens, he was tempted to visit that country for the improvement of his art; and became, on the war suddenly breaking out again, a *detenu* amongst many others. Napoleon, however, with that respect which he usually paid to extraordinary talents, permitted him to retire to Italy, where he was seized with a fever and prematurely expired.

Stratford-upon-Avon is a pleasant ride of about eight miles from Warwick. The traveller passes through a long and ancient arched gateway, which formed one of the fortified

* In this assembly a proposal was made to save the life of the unfortunate favourite, when a voice was heard to say—"You have caught the fox: if you let him go, you will have to hunt him again."

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entrances to the town, and vividly recalls to his mind the insecure state of society in the feudal age. The road leads through a picturesque country, ornamented with manifold beauties of rural life and quiet homesteads,—of parks, and woods, and stately villas. But what is more, the road by which it is reached nearly skirts the park of Fulbrook, which Ireland asserts was the true scene of Shakspeare's deer-stealing propensities. Stratford itself is full of interest, and would take a day, "a summer's day," as Yorick says, to explore it effectually. Its early records ascend three hundred years before the Norman Conquest, and old Camden, in his survey, calls it "a proper little mercat towne." Perhaps no place, not now an Episcopal see, has had so many bishops as lords of the Manor, from St. Wolstan down to Walter de Maydenstone,—and what is perhaps as singular, so many annual fairs, as the result of their ghostly care over the souls and bodies of its favoured inhabitants, the last of which, the fifth, continued for fifteen days. The town rises gently from the green sloping banks of the Avon, over which is a fine stone bridge, of fourteen pointed arches, built in the reign of Henry the Seventh. Like many other places of antiquity that have lived to the present time, it possesses what are called by way of chronological distinction, the Old and New Towns; though two fires, of a most destructive character, have contributed much to clear away the monuments of domestic antiquity, and to modernise the whole. Happily the house in which Shakspeare was born remained unscathed in these conflagrations, and still retains most of the original features it possessed when, in the ides of April, 1563, the immortal bard first opened his eyes on the light of Britain.

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The jubilee which took place September 6, 1769, under the direction of Mr. Garrick, in honour of the poet, drew crowds of visitors of all ranks to this place; and ever since that time, natives, and foreigners from all climes, have drawn near to Stratford, like pilgrims to the shrine of some patron saint. The little room in Henley Street bears on its white-washed walls the inscriptions of Scott, Irving, Byron, Hemans, Schiller, and hosts of other illustrious names. Some of these pilgrims have left their poetical effusions in the little recording volume kept here. This is one by the American Mecænas, as Mr. Washington Irving is sometimes called:—

"Of mighty Shakspeare's birth the room we see,
That where he died in vain to find we try;
Useless the search; for all immortal he!
And those who are immortal never die!"

The American said truly, that the room where the poet breathed his last was no where to be found; and for this substantial reason,—the fabric in which it was included had been rased to the ground, and its site had been turned into a garden. It matters not to relate the story of its demolition, or the fate of the mulberry tree, planted by his own hand, which perished in the very maturity of its beauty. It is "an owre true tale;" and we commit it to the sack of Goethe, as the German did all disagreeable things. That Shakspeare died is certain, and that too, like Petrarch, on the anniversary day of his birth, the 23rd of April, 1616. It is not hazardous to predict that his poetry will live as long as the language of man exists.

The church at Stratford is well worth a visit, not only for the precious monuments it contains, but because it is in itself

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an interesting structure, built in the early style of English architecture, and is the most ancient edifice in the town.

> "————— That majestic pile,
> Whose sacred foot for many a distant day
> Has press'd the verge of Avon's wat'ry way,"

is approached by a long avenue of limes, which intermingle their topmost branches, forming a grateful shade, and casting a solemn and subdued light over the road that leads to this sanctuary of the cross. The interior has recently undergone very considerable repairs and improvements, under the direction of Mr. Hamilton, an artist of great taste and professional talents, who has restored the richly-ornamented details that had been injured by time, or obscured by the injudicious colouring of the walls. The chancel is separated from the body of the church by a richly-carved oak screen, and is lighted by a range of windows on each side, in the later style, with a large east window of elaborate tracery. On the north side, near to the altar, lie the ashes of the poet, beneath a slab which bears this inscription, written by himself:—

> "Good friend! For Jesus' Sake Forbeare,
> To Digge the Dust Enclosed Heare;
> Bless'd be ye man yt Spares Thes Stones,
> And Curst be he yt Moves My Bones."

On the north wall, inarched between two Corinthian columns of black marble, is his bust, representing him in the act of composing, with a pen in his right hand, and his left resting upon a scroll on a cushion.

There are many other interesting monuments in this church, especially to the Clopton family, and one to John Combe, Esq., whose satirical epitaph is said to have been

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written by Shakspeare, to commemorate his usurious practices, in the following verse:—

"Ten in the hundred lies here ingrav'd,
'Tis a hundred to ten his soul is not sav'd;
If any man ask who lies in this tomb,
Oh! Oh! quoth the Devil, 'tis my John-a-Combe."

The visitor must not leave Stratford without seeing the Guild Hall, not because it possesses many architectural claims to admiration, but to look at the statue of Shakspeare, which was presented by Garrick, on the celebration of the jubilee, and which summons his attention to the north end of the building. On that occasion the poet's sculptured representative was crowned with the laurel that would have well become his living brow, and the crowded assembly were ready to cry, "All hail!" to the dramatic muse of Britain.

On a scroll, to which one hand of the statue points, are inserted the following lines from *The Midsummer Night's Dream*:—

"The poet's eye, in a fine frenzy rolling,
Doth glance from Heaven to earth, from earth to Heaven;
And as imagination bodies forth
The forms of things unknown, the poet's pen
Turns them to shapes; and gives to airy nothing
A local habitation and a name."

On the pedestal are these words from *Hamlet*:—

"———— Take him for all in all,
We shall not look upon his like again."

Bodies corporate never lose sight of the appliances necessary to cherish their fleshly propensities, and the banquetting-room in the hall of the Guild of the Holy Cross does not form any exception to the general rule. It sweeps the length of sixty, and is of the portly breadth of thirty feet. Its chief attraction, however, is in the full-length portrait of Shakspeare, painted

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by Wilson, sitting in an antique chair, which decorates one end of the room, and immediately opposite, another of Garrick, leaning on a pedestal, which supports a bust of the poet, from the pencil of Gainsborough. The poet and the actor seem to look upon each other from the two extremities of the banquet hall with singular complacency.

The chapel which formerly belonged to this Guild possesses a beautiful north porch, the entrance to which is enriched with a highly-ornamented arch, surmounted by a canopy embellished with scrolls and flowers. The Free Grammar School of this place was founded by a member of the Guild, in the latter part of the fifteenth century.

About a mile to the west of the town is the little village of Shottery, in which the family of "sweet Anne" Hathaway lived, and where the poet "wooed and won her to his love." The cottage, which was the scene of the lovers' intercourse, is shewn, and the poet's courting chair, and other relics are brought before the eyes of the visitor; but they are of too dubious a character to raise implicit belief, or to excite much interest.

Stratford can now boast its mineral springs, and baths have been erected upon an extensive scale, with all the arrangements necessary for those who are in search of health or pleasure. This circumstance, connected with the alluring beauties of the surrounding scenery, and the many real objects of interest with which the town and neighbourhood abound, may, perhaps, at some distant day cause Stratford to become the rival Spa of Leamington.

It is but a ride of little better than four miles from Stratford to visit the beautiful little church of Hampton Lucy,

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which is, perhaps, one of the best modern specimens of the Tudor style of Gothic ecclesiastical architecture which the country can produce.

This elegant structure was erected from the designs of Rickman and Hutchinson, architects, of Birmingham, from the funds arising from a bequest of Mrs. Alice Hammond, widow of the Rev. George Hammond, rector of the parish, considerably augmented by the present incumbent, the Rev. John Lucy. The superb altar window of stained glass was the princely gift of the same gentleman, and is, perhaps, unrivalled since the revival of that art in England. The design and execution are both by Mr. T. Willement, of London, and are evidences of his extraordinary genius and talent. In the compartments of the tracery within the arched window are introduced the A. Ω. I. H. S., and the Dove, as indicative of the three Persons of the Blessed Trinity; and also the Angel, Lion, Calf, and Eagle, as the emblems of the holy Evangelists. The remaining divisions are occupied by foliage ornaments. In the centre opening of the lower part of the window, under a rich Gothic canopy, stands the whole length figure of St. Peter, to whom the church is dedicated, the pedestal being inscribed with his name. Immediately beneath this figure are placed the impaled arms of King Philip and Queen Mary, by whom the advowson of the rectory was given to Thomas Lucy, of Charlecote, Esq., afterwards knighted by Queen Elizabeth. Below these, beneath a mitre, are the arms of the diocese of Worcester. The three openings on the right, and the three on the left are occupied by eighteen compartments, each beneath a Gothic arch, the upper six having pedimental canopies, containing the principal events in

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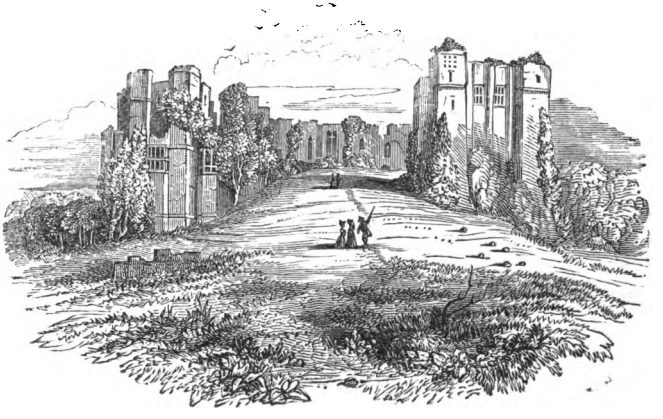
the history of the patron Saint. In a lower range below these subjects are six compartments, each containing the figure of an angel holding a shield of arms. At the bottom of the whole window runs the following inscription :—

MDCCCXXXV : HANC : VITRIAM : FIERI : FECIT : JOHANNES
LVCY : A : M : HVIVS : ECCLIE : RECTOR.

On a small shield suspended from the lower part of the centre compartment is the monogram of the artist.

The same reverend gentleman has also, at his sole charge, built an elegant cast-iron bridge over the Avon, corresponding to the architectural character of the church, with a raised causeway one thousand feet in length.



RUINS OF KENILWORTH CASTLE.

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VIADUCT OVER THE RIVER SOW.

CHAPTER XIII.

It will, perhaps, be considered that we have detained our readers sufficiently long amidst the interesting objects that connect themselves with the county of Warwick, we therefore gladly resume our Railway journey.

Leaving the Coventry Station on our way towards Birmingham, we proceed through the northern part of the excavation in which the Station is built, and pass on to an embankment

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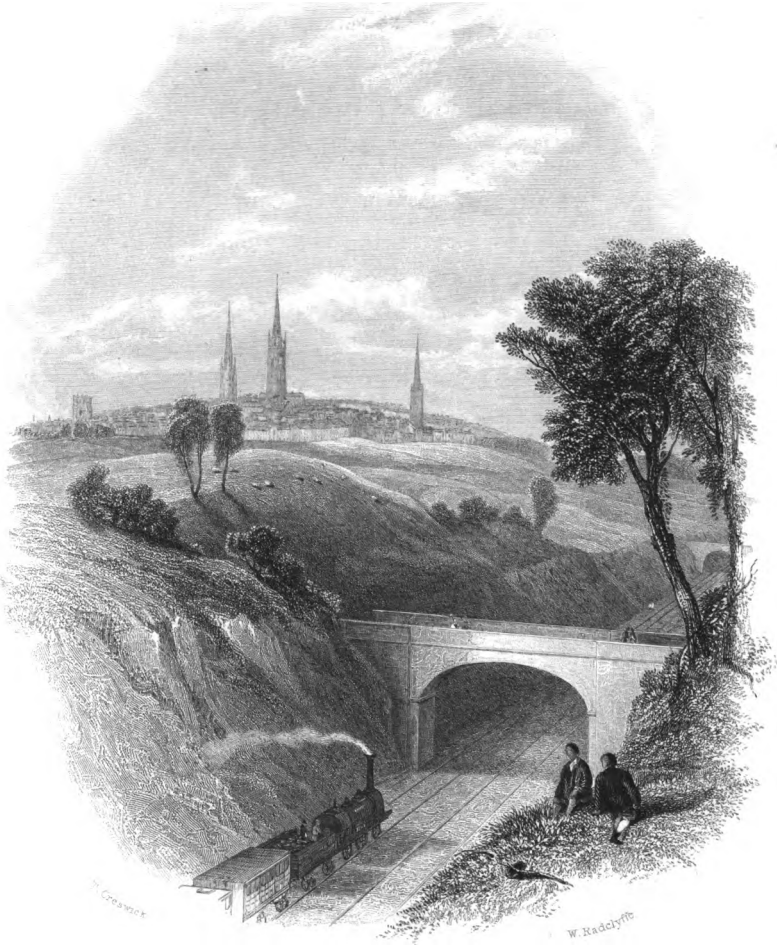

COVENTRY.

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nearly two miles in length, containing upwards of 210,000 cubic yards of earth, with trees planted on the slopes in various parts, from which we have a fine view of the now receding city of Coventry and its magnificent spires. To our right is the pretty village of Allesley, on the great Holyhead road, with its ancient church and tower nearly covered with luxuriant ivy.

The Railway soon enters into another excavation, which is cut through some high grounds, called the Meriden or Reaves's Green Ridge. This formidable ridge presented the last important barrier to the Company's undertaking. The cutting is composed principally of sandstone rock, of which nearly 200,000 cubic yards were removed, and which yielded great quantities of water. It is in some parts nearly sixty feet deep, and was originally intended to have been executed as an open cutting. During the progress of the works, however, it was determined to tunnel through the deepest parts of the ridge, and one was executed 292 yards in length. It is called the Beechwood Tunnel, and has a large ventilating shaft near the centre. The entrance fronts are of stone, with chamfered joints radiating from the arch, the face of which projects boldly from the side walls. Just beyond the Tunnel we pass under a very flat segmental bridge, thrown across the cutting at the very summit, and abutting wholly upon the rock, the span being seventy-six feet. The village of Berkswell is now to our right; to the north of which is Berkswell Park, the seat of Sir Eardley Wilmot, Bart., one of the members for the county.

Emerging from this rocky excavation, the sides of which are jagged and salient, as if large masses of the sandstone had

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been rent asunder by gunpowder, and as if remaining in the state they were left by the explosion; the Railway passes over a short embankment before the train is precipitated into the Berkswell excavation, which is upwards of a mile in length and forty-seven feet deep, from which were removed 445,700 cubic yards. The rails for about two miles are at an inclination of one foot in three hundred and thirty, being the steepest gradient on this line, excepting between Camden Town and London. The various inclinations are marked at every change—the top of the mark shewing whether the train is about to go down or up the inclination, by being cut with a slope; this is reversed for the opposite line of rails on which the trains travel in the contrary direction; and each quarter of a mile is measured and marked, in accordance with the Act of Parliament.

Another embankment succeeds, which carries the Railway across the Blythe valley, and contains 476,654 cubic yards of earth. It is one mile and a half in length, and from thirty to thirty-five feet high. The river Blythe, which enriches and ornaments the valley by its graceful meanderings, is a tributary of the Tame, which falls into the Trent between Lichfield and Burton.

The Blythe is crossed by a bridge of two arches, each of fifty feet span; the centre pier is nine feet thick, and on either side are pilasters ten feet broad, dividing the main arches from two land arches, each of fifteen feet span, with six feet piers. A cornice runs along the whole length of the bridge carrying the parapet, the length of which is 132 feet; the level of the rails above the river is thirty-six feet, and the valley is about 330 feet above the sea. Presently we arrive at the Hampton

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Intermediate Station, that town lying close to the Railway on our left. Near this place the Railway from Derby, passing through Tamworth, Coleshill, and Stone Bridge, will unite with the London line, and thus form a communication by railway to Leeds and the north of England, as soon as the other lines, now forming in that direction, are completed. The spire of Coleshill church, about three miles to the eastward, is now a conspicuous object for several miles; the intermediate distance combining all the charming varieties of a richly-cultivated vale.

Proceeding onwards through another excavation, we leave the village of Bickenhill on the left, and pass, at a depth of twenty-four feet, under a strong brick bridge, of one arch of thirty feet span, which carries the great Holyhead road over the Railway; and about two miles further, enter upon an embankment a mile and a quarter long, and upwards of forty feet in height. Sheldon Brook, which hurries its babbling waters through this embankment, is crossed by a brick bridge 172 feet in length, of three semi-circular arches, each of thirty feet span, with piers six feet thick, the rails being forty-four feet from the surface of the stream. In a short time we enter the county of Worcester, an arm of which crosses the line here, in an excavation half a mile long and thirty-seven feet deep.

It was in this contract that a novel and ingenious method of excavating was first tried,* under the skilful direction of the assistant engineer, Mr. R. B. Dockray, a gentleman who now holds the appointment of resident engineer for one half

* By Mr. Thornton, contractor for the works.

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the line, having before superintended the division from Birmingham to Hampton, which is executed in such a superior manner as fully to justify the high opinion formed in every quarter of his engineering abilities. To estimate the plan properly, it will be necessary to describe the old system of operations:—On commencing the work a deep trench or gullet was cut, ten or twelve feet deep, and as many wide, at a suitable inclination for removing the excavated materials. When this gullet was carried quite through the hill, the sides were cut away to the edge of the slopes by "falling"—that is, by undermining at the bottom and driving wedges from the top and a few feet from the face, which brought down the earth in large masses; it was then reduced into smaller pieces, and carried away in waggons. In this way the whole of the upper part of the excavation was removed, to the depth of the gullet, by which time a similar gullet was brought up from the commencement of the work, which lowered the excavation twelve feet more; and so on, until the whole was removed; and each of these steps is called a "lift."

The new process is the result of necessity, the parent of many useful inventions. This excavation was the key to the whole contract, and had to be pushed on with the utmost dispatch; and as wages were high and the men intractable, it occurred to the contractor that a plough might be effectually used. The material was a hard, dry marl; and after a few trials, and by increasing the strength and altering the form of the plough, the plan was crowned with a success, far beyond what was originally contemplated; for it was found that, in addition to dispensing with a number of men, employed in

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undermining, wedging, and breaking up, it reduced the material to such small pieces, that the labour of several men, who used to break it up at the foot of the embankment, was saved; and many excavations are now entirely worked with the plough.

An embankment, half a mile long, follows, and afterwards a cutting, forty-five deep and half a mile in length. This cutting has one of those lofty and elegant bridges of three arches thrown across it, which have been so often described in this work, and which leads to the village of Yardley, lying half a mile from the Railway to the left. The next embankment crosses a small valley, and also Stichford brook at a height of thirty feet by a brick bridge of two semicircular arches of thirty feet span each, the centre pier being six feet thick. This brook is the boundary of the county of Worcester at this point, and again entering Warwickshire, and leaving this embankment, we at length reach the last excavation on the line, which is an extensive one, being nearly a mile and half long and fifty-three feet deep, from which were removed 353,662 cubic yards of earth. The slopes here are very steep, and there are several lofty bridges thrown across the cutting, all of excellent design and workmanship. Great quantities of water issued from the ground during the execution of the works, causing much trouble and expence to remove it; this has been effectually done by means of a brick drain on the side of the Railway, which carries off any quantity that may flow out of the slopes.

The first view of the town of Birmingham is now obtained, situated like an amphitheatre on the opposite hill, presenting an appearance at once magnificent and interesting. The

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last embankment is traversed for a mile in length, at an elevation of thirty-seven feet: this contains 340,000 cubic yards, and at its termination is the splendid Viaduct over Lawley Street and the River Rea, built of red brick, with stone dressings; it consists of ten arches, being segments of circles, each of fifty feet span, with stone voussoirs—the rise being one-fourth the span; the piers are ten feet thick, and project beyond the face of the arches, the angles being chamfered off, and at the top of each is a stone cap splayed off to the face of the spandril; over the arches is a facia cornice, and plinth of stone, throughout the whole length of the Viaduct, and the long line of parapet is broken by stone pilasters over the centre of each pier: the arch which crosses Lawley Street is at an angle with the rest of fifty-five degrees—its square span being forty-four feet ten inches; and although this would appear to destroy the uniformity of the design, yet the arrangement is so admirable as not to be offensive to the eye. The total length of this viaduct is 711 feet, and the cost of its erection £16,000. As a specimen of superior workmanship it stands unrivalled on any line of Railway in the kingdom, or perhaps in the world. A short embankment intervenes between the viaduct and the Birmingham canal, which is crossed by a massive stone bridge of sufficient width to admit also of the Railway from Liverpool and Manchester to pass over, and was executed at the joint expence of the London and Birmingham and Grand Junction Companies. After crossing this bridge we arrive at the Birmingham Depôt, being 112¼ miles from Euston Square, London. The Station, which for convenience and admirable arrangement is without a parallel, will demand a detailed

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ENTRANCE TO THE LONDON & BIRMINGHAM RAILWAY,

BIRMINGHAM.

To C. R. Morrison, Esq. Capt. R.N. this plate is inscribed.

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account; for the traveller, on arriving at this vast establishment, is excited with surprise and admiration at the architectural effect of the buildings, and the excellent method adopted in disposing them for insuring accommodation.

The station for goods is on the right side of Curzon Street, and the passenger station on the left; and on this plan the ground was excavated, and the warehouses, offices for goods, and stables built, the earth being wanted for other parts of the station. The board room for the directors, the secretary's offices, the offices of the finance and correspondence departments, and the engineer's office, are all contained in one building, having a portico with four noble Ionic columns in the front, and four three-quarter columns at the back. The entrance to the Station is to the left of this building, on approaching it from the town, and the exit on the right, through archways. This front was designed by Mr. Hardwick, and built by Messrs. Grissell and Peto, of London, at a cost of £26,000.; the stones forming the bases of each column weigh eighteen tons. The booking offices, waiting rooms, and parcels office, are contained in the long building having a colonnade in front. The arrival and departure stages are about the same height as those in London; but the roof over them is much larger, there being six lines of rails under it.

The roof being one of the finest in the world, some particulars of its various parts may be interesting. It covers a space of two hundred and seventeen feet long and one hundred and thirteen wide. It is formed of wrought iron, in two spans of fifty-six feet six inches each; and the length is divided into thirty-three bays or spaces between each prin-

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cipal rafter, making thirty-four double or sixty-eight single sets of principals,—a double one being considered to go across both spans, or the whole width of one hundred and thirteen feet, and the single one going across the fifty-six feet six inches only.

These principal rafters are supported by three tiers of open ornamented arched girders of cast iron, each tier running the whole length of the roof, the girders being supported by three rows of cast iron columns, one at each side of the roof and one in the middle; these likewise run the whole length of the roof; and at the row next the booking offices, the roof is firmly attached to the wall of that building by wall plates, inside and out, with connecting bolts.

The feet of the principal rafters are tied in by tension rods running across, a little above the horizontal line, which are connected with the upper angle of the principal rafter by a king bolt; and each half of the principal, right and left of the king bolt, has two queen bolts and diagonal braces, the lower ends of which slope in towards the king bolt, and are connected at the bottom to the tension rods. There are eight hundred and four longitudinal stretchers fixed between the principals at the top, to tie them firmly together, and two hundred and one longitudinal stretchers at the bottom, in a line with the tension rods.

The weight of the cast iron in columns, girders, bases, gutters, &c., is about eighty tons; the weight of the wrought iron in principal rafters, tie rods, tension rods, &c., is also eighty tons; the weight of the planking and slates forming the roof is one hundred and sixty-five tons. Taking into consideration the nails, screws, pins, bolts, and other matters

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of that kind, the total weight of this immense roof may be taken at three hundred and twenty-six tons!

At the end of the departure stage is a small building, containing the police office, porters' waiting room, store room for lost luggage, &c. Farther on is the locomotive engine-house, which is exceedingly well adapted for its purpose; although it is rather in the way of the lines of rails, and occasions thereby an awkward curve. The locomotive power for conveyance of passengers and goods is furnished by Mr. Edward Bury, of Liverpool, an eminent builder of railway steam engines, with whom the Company has made a contract.

The locomotive engine-house is a building with sixteen sides, capable of holding sixteen engines and tenders, or thirty-two engines alone: these stand with their ends towards the sides of the building, one against each, on sixteen ways, all meeting on a turn-plate in the centre, by which the engines are sent to the respective lines of rails, which run from the engine-house to the station. Under each engine is a pit, three feet deep, which enables the engine-men to get underneath the engine to examine, clean, or repair it. There are eight water-cocks near the pits, so that a pipe and hose are placed to every engine, without crossing any other. It is mentioned as a fact that the water laid on by the Birmingham Water Company has so great a pressure on it, that it will make its way into the engine boilers when the steam is up; and also that a boy, not long since, endeavouring in mere play to get out a wooden plug, driven into one of the water-ways, at last succeeded, when it flew out like a shot, beating in his skull, and killing him on the spot.

In front of the engine-house are store rooms, offices, and

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workshops, over which is a tank, holding one hundred and seventy tons of water, with a provision for a steam-engine to work a pump from a well below, in case the supply from the Water Works Company should fail. The engine-house is built on land about twenty feet lower than the present surface, under which are store rooms for coke, and a communication to a large coke vault under ground, which opens to the canal.

In the locomotive department, preparations of all kinds have been made to ensure the safe and economical working of the Railway. Each engine carries a box of tools: the various out-stations which have locomotive engine-houses, have them fitted up with forges, vices, and work-benches, enabling the engines to receive trifling repairs. In the locomotive engine-houses at Birmingham and London, more extensive works are carried on; but the whole of the repairs of consequence will be done at Wolverton, near the centre of the line, where preparations have been made on a scale fully equal to what may be required. It may not be uninteresting to mention, that the engine consumes about twenty-two thousand gallons of water, and twenty-four hundred weight of coke, in an average trip to London; and that the tender carries a ton of coke, and about seven hundred gallons of water.

For the accommodation of travellers going the whole distance from London to Liverpool or Manchester, the trains which arrive from London run into the Grand Junction Railway Station at Birmingham, where the passengers are allowed sufficient time for refreshment. The trains also from Manchester and Liverpool run into the London and Birmingham Station, from whence they are forwarded after a brief interval.

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The directors of the Company are chosen by the body of shareholders, a certain number retiring annually. There are two boards of direction,—one at Birmingham and the other in London. To the latter, Mr. Creed, one of the secretaries, devotes his whole time, and there is no one connected with this great work more acquainted with its affairs; indeed, from the formation of the Company, and during the arduous struggle in Parliament for the Act of Incorporation, Mr. Creed's talents were exerted with the greatest success. From the general board of direction three members are chosen, who form a board of administration. The under secretary, Lieutenant Featherstone, R. N., (who has now the active management of the police department), has been for years one of the most valuable and indefatigable officers connected with the undertaking; and to him the public are much indebted for the regularity and dispatch, for the order and attention, which travellers have always experienced at the Birmingham Station.

The History of the great Railway between London and Birmingham is now finished. A wonderful work it is to look upon, whether it be contemplated in its magnitude and difficulties, its science and capital, or its utility and results. It stands as much the monument of this age as any of the great works of antiquity that have been the subjects of the world's history. There is, however, this difference in its favour, that while they have been raised in the cruel exercise of despotic power, and have mainly subserved the purpose of personal vanity, this has been accomplished by the profitable employ-

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ment of the redundant capital of a single district, to meet the wants of a vastly-improved people, and is the triumphant invention of Science, trained and disciplined under severe study, and gathering accelerated strength from the successful experiments of each succeeding year. The flexible power of steam was, indeed, known to the philosophers of former times; but they used this knowledge only for the fantastic purposes of caprice and amusement. Anthemius, in the age of Justinian, employed his acquaintance with this principle to annoy a troublesome neighbour, and by imitating an earthquake frightened Zeno out of his house; and, at an after-period, Pope Silvester invented an organ, which was set in motion and worked by it. It is the glory of the present era, that science and utility go hand in hand to advance the improvement and happiness of the nation.

Every age of the world has furnished its own peculiar inventions, and these have generally been well adapted to the wants that suggested them, and to the condition in which society was at that time placed. It is a subject more than commonly interesting to contemplate Genius toiling amidst so many difficulties, and by patient perseverance overcoming all perplexity and opposition. It is, perhaps, still more interesting to observe it under the trials of its first experiments, amidst the doubts, unbelief, and sometimes jeers, of the multitude, self-possessed in the truth of its principle, yet tremulously fearful while lying at the mercy of the thousand contingencies that might thwart or destroy its hopes and expectations. Such was the case with Telford, on the final erection of the famous hanging bridge over the Menai Straits. It is said that his heart sunk as every successive bolt was

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struck, till overcome with the agony of his feelings, he retired to his cottage hard by, and awaited on his knees the result. The shouts of the admiring populace, when the wonderful fabric settled into its place across the turbulent waters, and his own almost inarticulate thanksgiving in his secret chamber, arose together in the triumph of that hour.

When poor Henry Bell, after years of thought, labour, and experiment, first pushed his steam vessel on the Clyde, it was done amidst the scoffs and evil surmises of those who assembled to witness the scene. The inventor died in poverty; but an obelisk that rears itself on the banks of that fine river, near Dunglass, attests the tardy, and to him almost useless, gratitude of his countrymen. Fulton embarked on the Hudson with the same contemptuous greetings and prognostications, from the very people who assembled in thousands to hail the arrival of the Great Western and Sirius steamers, across the vast Atlantic, to their own shores. He lived to see, and in some degree to share, the complete success of his genius and mechanical skill.* How deeply we are indebted to these children of science who carried forward their discoveries,—in the benefits of which we so largely participate,—almost broken-hearted, amidst the chilling indifference or the withering contempt of a selfish world!

The work of which we have been treating has involved nearly, if not altogether, a capital of six millions of money in its completion. This enormous amount will require three hundred thousand pounds per annum, merely to pay its in-

* The engine used by Fulton, in his first steam-boat on the Hudson river, was made by Messrs. Boulton and Watt, of Soho.

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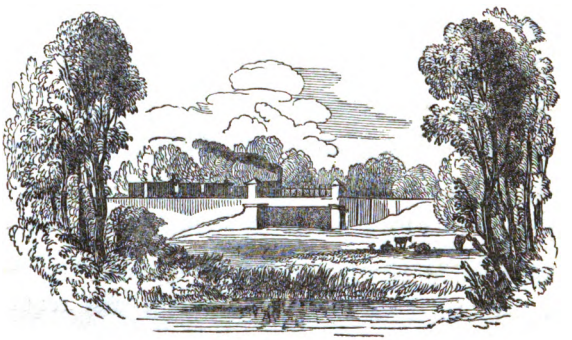
terest, at five per cent., besides a very considerable sum in addition, to defray the wear and tear, and other expenses of its yearly operations; and yet with all this immense outlay, it is certain, from the hosts of travellers it will allure into a state of locomotion from pleasure or profit, and the various lines that will eventually flow into it, that it will be one of the most productive Railways in the kingdom. We cannot, indeed, clearly foresee the end of such an invention, of which this is one of the greatest experiments, or the condition of society it may ultimately produce; but we are warranted in believing that this onward state of improvement, by facilitating and enlarging the sphere of social communication, will tend greatly to increase the amount of social happiness; and in its combining and assimilating influences over the great human family, will assist in bringing about the benevolent purposes of Him, "who hath made of one blood all nations of men for to dwell on all the face of the earth."



RAILWAY OVER THE CANAL NEAR CRICK.

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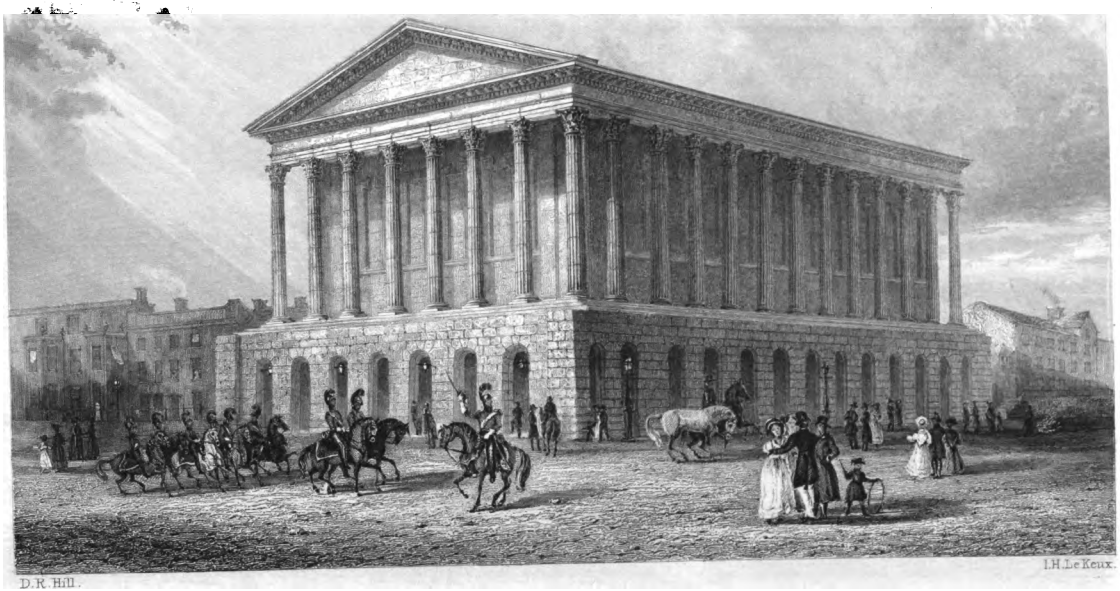

TOWN HALL, BIRMINGHAM.

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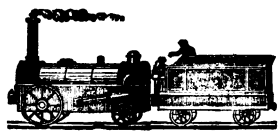

SECOND DIVISION.

BIRMINGHAM.

BIRMINGHAM is properly esteemed, if the extent and variety of its products be considered, one of the most important manufacturing towns in the British Empire. In the early accounts of this place, the etymology of its name has been followed through no less than a hundred and forty variations, ranging from Bromwycham to Bermyngeham, which, from their complicity and number, have puzzled the mind, and stimulated the invention, of many a learned antiquary, who has sought in the productions of the soil, or in some local or neighbouring circumstances, for a satisfactory explanation. The probable fact is, however, that it took its title from the Lord of the Manor, one Peter de Birmingham, who, in the year 1154, as the historian of the county writes, "had a castle here, and lived in great splendour. All the succeeding Lords resided in this place, also, till the cruel expulsion of the family in 1537, by an act of unexampled treachery and injustice, perpetrated by the Duke of

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Northumberland, the Lord paramount, then residing at Dudley Castle, about nine miles distant. The old castle followed the fate of its ancient Lords, and is buried in the ruins of time." The place, however, where it stood, for centuries after retained the name of the Moat, in commemoration of this ancient defence which formerly surrounded the manorial residence, and it has only recently yielded to that of Smithfield, now indicative of the useful purposes to which it is applied.

On the attainder and execution of Northumberland, the estate reverted to the Crown, who conveyed it to a Warwickshire family of the name of Marrow, by whom it was sold, and, passing through a variety of channels, the manor came at last into the possession of the present proprietor, Christopher Musgrave, Esq. of the county of Sussex. The market-tolls, forming a valuable part of the manorial rights, were sold by this gentleman to the Commissioners of the Birmingham Street Acts, for the sum of £12,500, and are now supposed to be worth nearly four times that amount.

Birmingham is advantageously situated on the side of a hill, or rather a series of hills. It is nearly in the centre of the kingdom, and, during the Saxon Heptarchy, was included in that portion of it which was under the sway of the Mercian Kings. It is now, however, in the county of Warwick, and the hundred of Hemlingford, and is bordered by the neighbouring counties of Stafford and Worcester. It is 110 miles N. W. from London, by way of Coventry, 116 by Oxford, and 112⅜ by the Railway. The superficial contents of the parish are 2864 acres, and its inhabitants are about 160,000. It became a borough on the passing of the Reform Bill, and has now attained to the importance of a corporation town under the new municipal act.

The atmosphere of this place, from the comparatively high position which it occupies, is not less congenial and kind than the dry sandy soil, on which it is built. It does not, as it is justly remarked by a modern author, "crouch in humility of site, but boldly solicits the ingress of the winds from each point of the compass; and as few of the streets lie on a dead flat, every shower conduces to cleanliness and health: this, with the admission of free access to

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currents of air, and the sun's genial rays, prevents agues, and all the train of epidemics from being known." There could not, perhaps, be adduced a stronger evidence of the truth of this remark than the fact, that while the cholera which passed through the kingdom like a destroying angel a few years since, was raging with the most destructive violence in the little town of Bilston, distant from Birmingham only about eight miles, and throughout the surrounding district of Staffordshire, scarcely a single fatal case of this disease occurred in this place. Many persons entertain the idea that our good town of Birmingham is literally enveloped in a cloud of dingy atmosphere, arising from steam-engines, and the various metallic manufactures in constant operation. A distant view of the place, with the towering chimneys of its furnaces vomiting forth columns of smoke, might, indeed, seem to give confirmation to such an idea; but it becomes speedily dissipated as the visitor enters the clean and spacious streets of this town, and observes that the chimneys, from their extreme height, give their smoke to the winds, which carry it far away from the place where it is generated. It is well known, also, that the fuel which is used in its manufactures, is much lighter than the Newcastle-coal, and, consequently, deposits less of those black particles which thicken the air and disfigure the buildings of the Metropolis.

Resting, as Birmingham does, upon the very lap of the kingdom, the course of its history has not been permitted to run smoothly along. In the Civil Wars between Charles I. and his Parliament, it took a decided part on the popular side. It was attacked by Prince Rupert, in April, 1643, and though only defended by one hundred and fifty musqueteers, one troop of horse, and the sturdy townspeople, with such trifling defences as they could hastily throw up, it maintained the contest for two days. This feeble force was, however, broken, and "the Cavaliers rode up into the towne like so maney furyes or bedlams, and hacked, hewed, or pistolled all they met withe." A few houses were burnt at that end of the town where the Prince was encamped, which is called to this day Camp Hill; and after the payment of a heavy tribute, the hostile forces were withdrawn, having lost a considerable number of men, amongst whom were some persons of distinction.

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A century and a half had passed away,—a long period of internal tranquillity and extraordinary improvement in the condition of the town,—when the memorable "riots" took place, which better deserved the title of "Birmingham's flames" than the attack of the "accursed cavaliers," to which this title was affixed in the descriptive pamphlets of those times. On the 14th of July, 1791, some gentlemen met to dinner at the Royal Hotel, to celebrate the anniversary of the French Revolution,—an event which was hailed by hope, and fear, and bitter hatred, according as it affected the principles, anticipations, and interests, of the different political parties of the kingdom. A mob of mistaken men, and those too of the lowest order, assembled, and commenced a violent attack upon the hotel. The police, either too weak or too timid, permitted this act of aggression to pass with impunity. The mob rapidly increased; and becoming emboldened by its numbers, and infuriated by the addition of some desperate, and probably designing, spirits, proceeded to acts of extensive destruction. The two meeting-houses belonging to the Unitarians were assailed, and buried in ruins: the private house of Dr. Priestley, one of their ministers, shared the same fate, with his valuable library, philosophical apparatus, and manuscripts, the industrious collection of years of close observation and literary toil. During the four days of violence and misrule, in which the mob proceeded in its course of unrestrained destruction, the house of Mr. Baskerville, the celebrated printer, and of Mr. Hutton, the original historian of the town, with those of many other gentlemen of the first respectability, were utterly demolished or essentially injured. In all cases where an attack was made, a general pillage ensued; and it not unfrequently happened that the drunken miscreants were eventually buried under the burning ruins of the buildings which their own hands had fired. The mob was proceeding in its career of desolation to Edgbaston Hall,* the residence of Dr. Withering, the

* This house was formerly a moated mansion, and in the wars between Charles and his Parliament was garrisoned in the cause of the latter, and commanded by a person of the name of Fox.

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eminent botanist, when happily it was prevented by the arrival of a military force, which effectually put an end to the riots, after a scene of violence, tumult, and destruction, such as had rarely been seen in any civilized community.

The total loss sustained by the town, from this dreadful event, was estimated at £60,000.; and two miserable wretches suffered the extreme penalty of the law for their crimes. A season of profound peace has succeeded to this eruption of popular fury, which was not, in any degree, interrupted by the immense assemblies that were congregated in this place, on the occasion of the Reform Bill. It is but just to add, that while this great national measure excited the most powerful interest throughout the town and neighbourhood, to which, indeed, its successful completion is mainly attributable,—and this important fact is a matter of history, —not an act of violence was committed. These assemblies were held in the open air at Newhall Hill, an elevated piece of unoccupied ground on the west side of the town, and were not unfrequently attended by, probably, hundreds of thousands of persons at one time. It became the subject of interesting contemplation to see these immense multitudes, at the conclusion of their several meetings, streaming through the various streets, like the great currents of human life, and presently subsiding into their different localities, in all the calm of the most profound stillness.

Old Leland, in his celebrated *Itinerary through the Kingdom*, three centuries ago, writes thus of Birmingham:—"The beautie of Birminghame, a goode market towne in the extreme parts of Warwickshire, is one streete going up alonge, almost from the left ripe (bank) of a brooke, up a meane hill, by the lengthe of a quarter of a mile. I saw but one parishe churche in the towne." The quaint simple-minded historian goes on to say, "I came through a prettie streete, as ever I entered, into Birmingham towne; in it dwells smithes that use to make knives, and all manner of cutting tooles, and many lorimers that make bittes, and a great many naylers." We are indebted to this minute detail, not only for an insight into the occupation and principal trades of the "rude forefathers of *the hamlet*," as this town is called in its early records,

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but also for a homely view of the local and architectural character which it presented at so early a period. The manufactures of Birmingham, however, have undergone as great a change as its site, architecture, and population. From "smithes and naylers, and lorimers," as they are termed, its artificers have ascended through all the gradations of useful and indispensable productions, ministering to the necessities of every-day life, to the manufacture of all the conceivable articles of personal ornament and domestic luxury, adapting their fabrications to the ever-shifting caprices of human device and fashion.

The Restoration seems to have been the first era that gave an onward impulse to the ingenuity of the inhabitants of this town.—The love of ornament and show was imported with the licentious Charles II., and the gay companions of his exile, from the luxurious Court of Louis XIV., where they had been long resident. The flowery and flowing style superseded the stiff and Gothic, which characterised the furniture, domestic decorations, and personal embellishments of our ancestors. The sleight-of-hand attained by the artificers of Birmingham fitly prepared them to take advantage of this change of fashions, and this town being the mart of the brilliant and ductile metals, soon became, what it was afterwards styled by Burke, "the toy-shop of Europe." The wars which spread over Europe from the time of Louis XIV. to the French Revolution, introduced a new era into the manufactures of Birmingham, and, in addition to the *bijouterie* of fashion, came the production of fire-arms, to supply both friends and enemies with warlike implements, from the richly-ornamented pistolet, to the most ponderous piece of artillery, with all the manifold weapons of war.* Peace

* "It appears that English manufactured fire-arms were not held in very high estimation in the early part of the reign of William III.; for it is said, that being heard at one of his levees to express much regret that he was obliged to import fire-arms from Holland, at considerable expense and with great difficulty, Sir Richard Newdigate, one of the members of Parliament for the county of Warwick, being present, opportunely recommended his Birmingham constituents to his Majesty's notice, as being fully competent, if duly patronised, to obviate

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has, however, literally "beaten the swords into ploughshares, and spears into pruning-hooks." The dexterous artificers of the town were ready to profit by the change, and the fabrication of every species of agricultural instrument and working tool used in the peaceful handicraft arts, with the multifarious articles of personal attire, has followed.† Successive demands, either of necessity or luxury, have called forth new and applicable powers to meet them, and the hammer, the lathe, the rolling apparatus, the press, the stamp, the die, the draw-bench, and the steam engine, have each supplied their mechanical and multiplying agencies in the order of wants thus created. We know not that a time will ever arrive in which it shall be said to the inventive faculty of man, "thus far shalt thou go, and no farther." A long period of national and local tranquillity has given space for the creation of new wants, and the developement of new energies. In this interval one discovery has followed fast upon another, the sciences have yielded to the patient perseverance, and the penetrating genius of the human intellect, and new combinations of primitive elements have become the basis of new mecha-

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the difficulty complained of. The King immediately dispatched Sir Richard Newdigate into Warwickshire with an extensive order, and Birmingham has ever since been as famous for the manufactory of fire-arms as for all other ingenious productions. The manufacture of fire-arms was subsequently carried to such an extent in England, that from 1805 to 1815, 3,079,120 gun-barrels and 2,935,787 locks, for the use of Government, were manufactured in Birmingham alone; of which, 1,827,889 were completed as muskets, carbines, &c. The supply was, in general, 30,000 stand of arms per month, or two in a minute! This number is exclusive of fire-arms manufactured there for the East India Company's service, during the same period; to the number, as it has been calculated, of about 1,000,000; and exclusive, also, of trading guns, fowling-pieces, &c."

† "The manufacture of buttons comprises about sixty separate branches of handicraft, many of which are assigned to females and boys. In the principal manufactory for this article, forty tons of button-shanks have been made annually; and the whole number of shanks made annually in Birmingham is estimated at 60,000,000."

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nical and handicraft inventions. The vastly-accelerated energies of the mind have seemed to call for corresponding vivacity of physical locomotion, and man, whose imagination can stretch from place to place in the lapse of a moment, seems destined to attain to a celerity of corporeal transition almost co-equal. The perfection of the steam-engine, and the application of this principle to locomotion is another remarkable era in the history of this place, fraught with invaluable results. The improvement and completion, if not the discovery, of this wonderful engine, is indigenous to Birmingham, while the real science, ingenious contrivance, and manual dexterity concentrated in this place, with "all the natural appliances to boot," seem to bespeak for it the very extensive manufacture of this gigantic machine. Thus the whole circle of the mechanical arts, from a gold ring to an iron railroad; from a button to a brazen Colossus; from a teakettle to a steam-engine; appears destined to run its course in this highly-favoured town, and its immediate neighbourhood, "for ever and for aye."

The visitor, on entering Birmingham, is most anxious to see its peculiar products, and the manufacturing process by which they are obtained. We will therefore, in the first place, conduct him to the Show Rooms of Mr. Collis, who has succeeded to those formed with so much taste and splendour by Sir Edw. Thomason. The great lions of this establishment are the faithful copies of the celebrated Warwick Vase, and the colossal statue of George IV. in bronze. The original Warwick Vase, which now stands in the conservatory of Warwick Castle, is the Grecian Vase of Lysippus, a sculptor of the age of Alexander the Great. It was excavated from the ruins of Adrian's Palace, at Tivoli, and brought to England by Sir William Hamilton. The copy is metallic bronzed, and took the labour of seven years to complete. It has acquired by time, and the process adopted in its formation, a soft solidity of colour and a gradation of bronze tints, which give peculiar beauty to its rich and varied ornaments. The statue is of the same material, and was modelled, cast, and sculptured, in the manufactory. The suite of rooms is extensive, and the objects of curiosity and sale are classified. Amongst these are comprised the finest and most extensive collec-

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tion of medals to be seen in the kingdom; miniature copies of the Warwick Vase in silver, and in crystal, mounted on silver pedestals; a vast assemblage of plate and plated articles; and every minute variety of the ornamental and useful manufactures of the town.

A range of workshops and manufactories, where the most costly articles of the Show Rooms have been fabricated, lie at the back part of the premises, and are open to the inspection of visitors.

The Show Rooms of Messrs. Jennens and Bettridge, in Constitution-hill, offer a very attractive exhibition of the manufactures of Birmingham in *papier maché*. Perhaps there is no art, of an ornamental character, that has been transplanted into England, from the country of its original invention, that has attained to so high a degree of perfection, and has been made susceptible of such multiform varieties, as that which is included under this title. The respectable establishment to which we have now introduced the visitor ranks as the first in this town, or perhaps in Europe, for its tasteful devices, the ingenious adaptation of beautiful materials, and the grace and finish of its execution. The Sale Room displays some singularly beautiful specimens, inlaid with rainbow-tinted pearls,* harmonising their cameleon hues with all the subjects of natural history, and thrown into all the forms and figures of ornament and use. The exhibition also comprehends that almost endless variety of indispensable articles which enter into the purposes of every-day life. A free admission is given to the visitors into the workshops; and the process of the manufactures very courteously and minutely described, if required.

Glass-making is an art practised with so much dexterity by the workman, and the various articles to which it applies are multiplied with so much expedition, that it might be thought the productions of one year, in this glass-blowing town, would leave a holiday for several succeeding years. Happily, however, for the artisan in this

* The discovery of the capability of this precious article to the purpose of this particular manufacture, we believe, is original in this establishment, and is said to have been occasioned by an accidental view of the "modes of colour," for which the pearl shell is remarkable.

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branch of human device, the brilliant utensil is as easily broken as the air bubbles of a child, which it not inaptly resembles in its first appearance at the end of the artificer's tube, before it is fashioned by the breath of his mouth into the form which it is finally intended to assume. The process of glass-cutting, nevertheless, is not of so aerial a character. It requires a practised eye and a dexterous hand; and is, besides, a work of continued labour and persevering industry. Both these departments of the manufacturing art are carried on to a great extent in this place, and a splendid variety of their united productions is to be found in an extensive suite of Show Rooms belonging to Messrs. Rollason and Sons, in Steelhouse-lane. In this exhibition there is also an assemblage of the most brilliant and useful productions of the Staffordshire Potteries, in all their variety of decoration, form, and application. The proprietors are very polite in shewing to visitors the process of glass-making and cutting, as carried on in the manufactories with which they are connected.

Besides these exhibitions which have been enumerated, Birmingham contains many splendid shops, devoted to the display of its peculiar productions,—of which the most eminent are in High-street, Bull street, and New-street. Many of the manufactories, not connected with any retail establishments, may be visited by strangers, upon application, or by an introduction from some respectable inhabitant of the town.

The stranger, after having travelled over workshops and manufactories, will be glad to find himself once more in the open street; and as "restlessness is the peculiar character of the present generation," he need not tarry long, before he discovers another object ready to engage his attention, and, we predict, to fix for some time his admiration. The Town Hall is the most magnificent structure in Birmingham, and from its pure classic design, elaborate architectural ornaments, extent and capacity, is an object of well-merited curiosity and interest to every visitor. It is a simple Corinthian Temple from the example of the Temple of Jupiter Stator at Rome, and is the design of Messrs. Hansom and Welch. It is built of brick, cased with Anglesey marble, from the Penmon quarries,

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which was presented by Sir Richard Bulkley, Bart., to the architects, and from them to the town. Its quality is considered almost imperishable, and the colour is a fine neutral grey which whitens with time.

It is colossal in its proportions, and rears itself with peculiar majesty from nearly the highest point in Birmingham. On each side and in front is a projecting rusticated basement of prodigious strength, twenty-three feet in height, which encloses a spacious corridor, and convenient entrances to the great hall. Surmounting the basement is a gradual flight of regular ascending lines of shallow steps, and on these rise, with surpassing grace and dignity, elevated ranges of richly-fluted Corinthian columns that encompass the building. The spacious room which this splendid edifice contains is, perhaps, the largest in Europe, or in the world, having a clear length of 145 feet, with 65 feet in width and height. It will contain from eight to ten thousand persons, standing within its ample area, and possesses two side galleries tastefully decorated, which are entered by doors from the corridor behind, with an end gallery of great depth and elevation. It is lighted by twenty-seven lofty windows, separated by ornamental pilasters of the same order as the building; by the side of which are massy antique candelabra, harmonising with the colour of the interior, and taking their tone from the walls and the rich impanelled ceiling. A grand staircase in front leads to the galleries, which flies off to the right and left to correspond with the upper corridors. The projected cost of this magnificent structure was £24,000, raised by a rate upon the inhabitants of the town; besides which £6,000 was paid by the friends of Mr. Welch, one of the architects, who became bound for the accomplishment of the contract, which was found inadequate to the undertaking. The total amount therefore was £30,000. But few persons have an opportunity of visiting the "eternal city;" but they may form some idea of what must have been the architectural grandeur of that ancient "mistress of the world," sitting in her glory in the midst of her assembled fanes, by making a pilgrimage to this Temple of Jupiter Stator at modern Birmingham.

The entire end of the Hall is filled by an orchestra and the

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splendid organ, placed here by the Governors of the Hospital for the use of the triennial Musical Festivals, instituted for the purpose of aiding the funds of that charity. This magnificent organ, in its dimensions, exceeds the celebrated instruments of Haerlem and Rotterdam; and in the depth, power, variety, and sweetness of its tones, far surpasses any in Europe. It was built by Mr. Hill of London, at the expense of £6,000., raised principally by subscription.

In architectural beauty and interest the New Free Grammar School ranks next to the Town Hall amongst the public edifices of the place. We call it new, not only because it has been recently erected, but because it is the last of three that have been built on that foundation. The first which was of wood and plaster, very much like one of those half-timbered houses which yet remain, as examples of the domestic architecture of former times, lasted for nearly two centuries,—from Edward VI., the founder, to the time of Queen Anne. The second, erected in 1707, was an ample square brick building, with stone dressings and door-way, with a square projecting tower, surmounted by a cupola, and supported by two projecting wings. The present school is probably the finest modern specimen in the kingdom of the combined collegiate and ecclesiastical style, belonging to the late ages of Gothic architecture in England. The front elevation consists of a main body and two projecting wings all of the same height. Seven lofty four-centered windows light the central portion of the building. From each of the wings, which are set apart for the residences of the two principal masters, project two oriel windows which, by being placed immediately above each other, add greatly to the general effect of the building. The front is equally divided by buttresses, ornamented with crosses, fleur-de-lis, crowns, and portcullis, and surmounted by tall, slender pinnacles. The form of the building exhibits a regular quadrangular figure, and has a back front corresponding nearly with the principal one, but containing a range of open arches, forming a court and cloisters. The entrance from the front is through a spacious porch, flanked by two buttresses supporting sculptured figures in stone of a lion and griffin, leading

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H. Harris. W. Radclyffe.

GRAMMAR SCHOOL OF KING EDWARD VI. BIRMINGHAM.

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into a vestibule ornamented with a groined ceiling, and branching off to the right and left into the apartments on the ground floor, which are appropriated to commercial education. Beyond is the corridor leading to the grand staircase, and thence to the different departments of the building. The whole of the interior architectural decorations and furniture are strictly in keeping with the style of the building.

The value of the original income of this foundation, which was anciently the property of the "Guild of the Holy Cross," was £21. The present annual revenue is probably £9,000.; and in a comparatively short time, from the falling-in of leases and other sources, cannot fail to amount to a much larger sum. The fixed salary of the head-master is £400., and that of the second-master £300., besides privileges appertaining to each, which will raise them to nearly double that amount. There are, besides, under-masters, whose permanent salaries are £200. each. Scholars are admitted at the age of eight years, but cannot stay beyond the age of nineteen. There are ten exhibitions, of £50. each, with a residence at Oxford or Cambridge for four years. Examinations are made every year, by three resident members of one of the Universities. Considerable honours have already been obtained by some of the scholars of this Grammar School; and, under its present talented and efficient management, it promises to become an institution of the highest utility in the town, and scholarly character in the nation.

This structure is built of excellent Derbyshire stone, and measures 174 feet in front, 125 feet in the flanks, and 60 feet in height, and cost about £40,000.,—the original contract being £36,000.

The Market Hall, built of freestone, from a design by Mr. Edge, is a chaste structure, in the Grecian style of architecture, with arched entrances flanked with Grecian-Doric columns, surmounted by a massive entablature; and, in its figure and ornaments, is far superior to that of Liverpool. Its longitudinal extent is 360 feet, and its width 108 feet, wih 60 feet in height. Over this spacious area is thrown a roof, with a lantern centre. It is lighted by 25

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lofty windows on each side, with six at the west and three at the east end, besides the lantern, which is composed of ample moveable windows, both for light and air. Seventeen series of beams support the roof, and these again are sustained by seventeen pairs of iron pillars, which form the longitudinal avenues of the interior; this space is divided into compartments and stalls, for the sale of every species of merchandize, for domestic use and consumption. The principal entrances are on the east and west, and are formed of Doric pillars, with triangular pediments, and are each approached by a flight of stone steps, with ample gateways. The side entrances have plain pyramidal projecting façades, with a flight of stone steps to each, descending to the vaults of the Hall. The whole is surrounded by an extended projecting entablature, relieved by triglyphs at the ends and over the entrances.

The Hall affords accommodation for 600 stalls, with sufficient walking space for about 4,000 purchasers of the wares that it contains. The cost of the building was upwards of £30,000., which is paid for by a rate upon the town, and the revenue of the weekly merchants, probably amounts to about £5,000. per annum.

In the open space before the front entrance to the Market Hall stands the Monument of Lord Nelson, a fine bronze statue from the design of Westmacott, which cost £3,000., raised by subscription.

If the beautiful room belonging to the Society of Arts should be open for its annual exhibition of pictures when the Railway traveller is in Birmingham, we could not prepare for him a more exquisite treat than that which he would enjoy in dwelling upon the treasures of art which, at such a time, it usually contains. The exhibition is alternately of pictures from the ancient and modern Schools of Paintings, and includes, besides the *chefs d'œuvres* from the collections of the nobility and gentry of the neighbourhood, and even at a considerable distance, many, in the modern School, fresh from the easels of the most distinguished living artists. The collection possesses also specimens from the pupils of the School, and members of the Society, that give distinct indications of superlative genius that will enrich this and future generations.

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The building is a Grecian structure, of the Corinthian order, with a projecting portico that stretches itself over the *chaussée* of the street. A rich entablature and cornice, surmounted by a triangular pediment, supported by four fluted columns, resting on a massy basement, adorns the front entrance. A flight of steps leads to the principal circular room of 52 feet in diameter, with fittings in keeping with the subject, and lighted from the centre of a lofty-domed roof. Three other apartments serve the purpose of a classification of water-colour drawings, casts, sculptures, and pictures. The students have a room for study, furnished with casts and other appliances, and are attended by masters, and occasionally receive the benefit of courses of lectures on anatomical expression. The expenses are defrayed by the produce of the exhibitions and private subscriptions.

The visitor will, doubtless, readily yield to an invitation which we now offer him, of a walk or ride to the Botanical Gardens, which stretch into the beautiful suburbs to the west of the town. It is a scene perfectly refreshing, especially if it be the summer season of the year, to leave the clamour of a thousand voices behind, and to trace the green and flowery paths of this beautiful spot. Grass plats and arboretums afford the successive charm of open space and thick clustering foliage, of all tints, to allure the footsteps of the visitor. Wayside beauties meet him at every turn, either in gathered groups of modest flowers, peeping with eyes of blue, "intensely blue," and petals of all colours, from underneath their leafy enclosures, near to the margin of the gravel walk; or else associated in coteries on the higher stations of the mounds, and looking somewhat haughtily,—the very aristocracy of the garden,—some glossy and sun-burnt, as queens from Eastern climes, or delicately pale, like ladies of the "sweet South," curling their proud, umbellated, liliaceous lips, and displaying beauties that well might arrest the step of any saunterer, and call forth the admiration which they seem to bespeak. If the visitor be a downright botanist, or only Nature's admirer *con amore*, let him hie him quickly to the noble conservatory, where he will find a rich and rare variety to provoke his investigation, or to secure his

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praise. This Institution was established in 1829, by subscriptions, and has regular exhibitions of fruits and flowers, and awards prizes.

The Museum of Natural History is not the least in importance among the public institutions of Birmingham, claiming the attention of the stranger. It may be visited by him on his return from the Botanical Gardens; for it lies in his way, if his hostelrie be in the best street of the town. This collection occupies a part of the building belonging to the School of Medicine and Surgery, in Paradise Street, of which the exterior possesses no particular architectural character, but the internal arrangements are well adapted to the objects embraced by the Institution. Besides the collection of minute and elaborate subjects in comparative anatomy, which are classified in one room, the Museum contains a large variety of specimens in Natural History, scientifically arranged under the departments to which they belong, some of them exceedingly rare, and ranging from the squirrel-like monkey of the Sandwich Islands to the huge hippopotamus:—from the humming bird to the albatross, that gigantic bird of storms.

To reach the Cemetery at Key Hill, will only lengthen a little the visitor's drive or walk, and he will be amply compensated by the many objects that cannot fail to attract and interest his attention by the way. For this purpose we suggest to him to direct his course along Ann-street, down Snow-hill, and he will distinguish on his right the Infant School and the Blue Coat School; the latter a spacious, plain, stone-cased building, bearing in niches, on the side facing the church-yard, the effigies of a boy and girl in the costume of the charity. The entrance to the Cemetery is certainly not very ornamental, nor does the subject, indeed, seem to call for it. The walks are, however, well laid out and planted, and the vaults are scooped out of the dry sand rock, in ranges that are convenient, and in situations that seem to combine the privacy and solitary beauty, that are felt to be the fitting attributes for the mausoleums of the dead. A Grecian chapel stands within the grounds in which the funeral services are performed, and the whole area is surrounded by a substantial stone wall.

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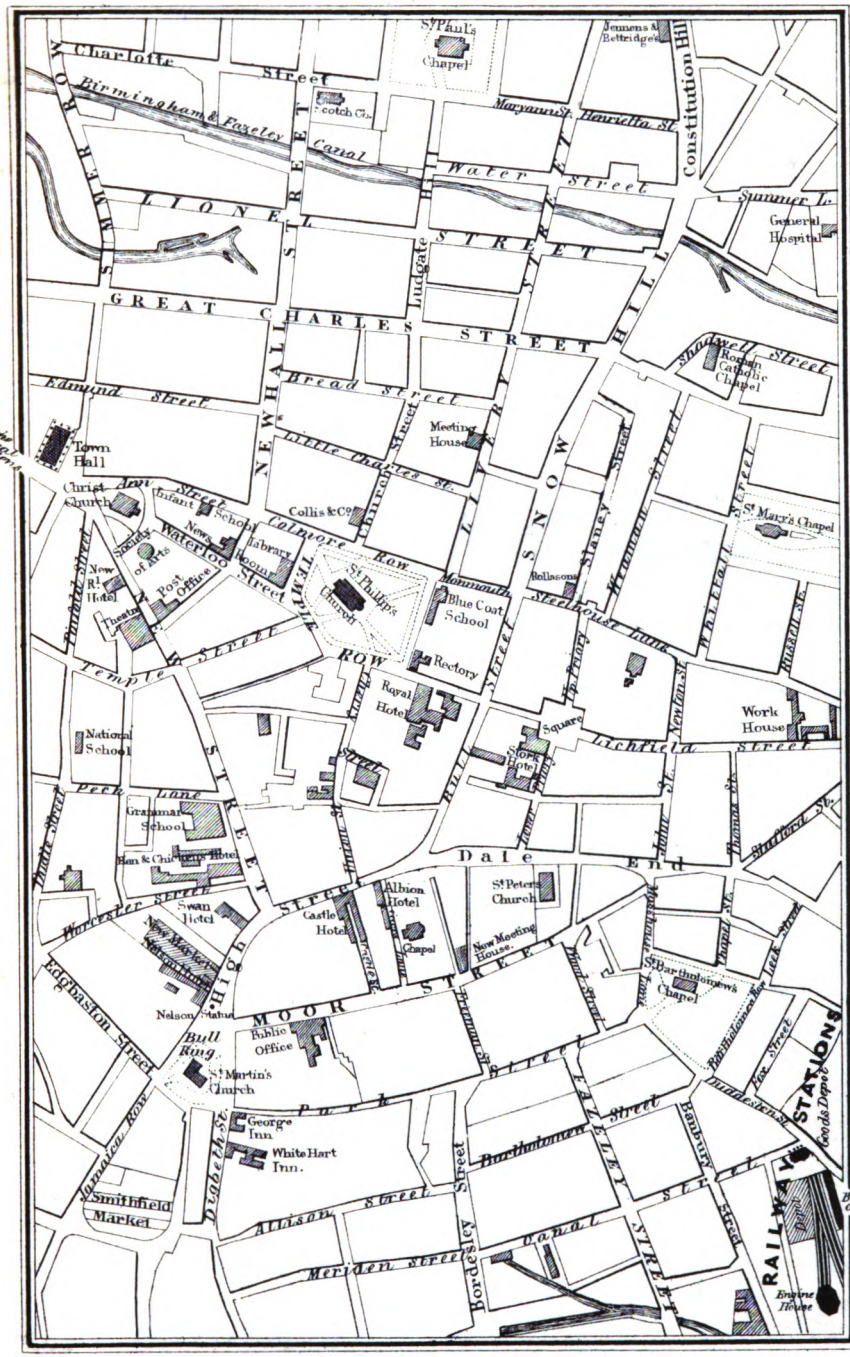
BIRMINGHAM.



Wrightson & Webb, New Street, Birmingham.

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WOLVERTON STATION.

ITINERARY

OF

THE LONDON AND BIRMINGHAM RAILWAY.

Left to Birmingham.	*Line of Railway.*	*Right to Birmingham.*
	LONDON STATION, Euston Square.	
	Bridge under Hampstead-road, Crescent Place, Park Street, &c.	
	Deep Excavation.	
	Bridge over Regent's Canal.	
Regent's Park.	Camden Town Depôt.	Kentish Town.

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Left to Birmingham.	*Line of Railway.*	*Right to Birmingham.*
Chalk Farm.	Engine houses, warehouses, &c.	Highgate.
Paddington.	Primrose Hill Tunnel.	Hampstead.
	Bridge under Edgeware Road.	
Kensington.	Kensal Green Tunnel.	
	Brent Embankment and Viaduct.	Edgeware.
Harrow-on-the-Hill.	Excavation.	
	HARROW INTERMEDIATE STATION, 11¼ miles from London.	
Pinner.	Excavation through the Oxhey Ridge.	Stanmore.
	Leave Middlesex and enter county of Hertford.	Elstree.
Rickmansworth.	Watford Viaduct.	
Watford.	Colne Viaduct.	
Cashiobury Park.	WATFORD STATION, 17¾ miles from London.	St. Alban's
Grove Park.	Watford Tunnel.	
King's Langley.	Deep Cutting, succeeded by an Embankment,	Abbot's Langley.
Nash Mill.	Iron bridge over Grand Junction Canal.	Hemel Hempstead.
	BOXMOOR INTERMEDIATE STATION, 24¼ miles.	Two Waters.

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Left to Birmingham.	*Line of Railway.*	*Right to Birmingham.*
Bovingdon.	Embankment and Skew Bridge.	
	Bridge over Canal.	
Berkhampstead.	BERKHAMPSTEAD INTERMEDIATE STATION, 28 miles.	
	Dudswell Excavation.	Berkhampstead Common.
	North Church Tunnel.	Ashridge Park.
Tring.	Deep Excavation.	
Wendover.	TRING STATION, 31¾ miles from London.	
	Pass under numerous Bridges thrown over the Excavation.	Ivinghoe.
	Enter the county of Buckingham.	
Cheddington.	Considerable Embankments for four miles.	
Aylesbury.	Junction with Aylesbury Railway.	Dunstable.
	Level country.	
Soulbury.	LEIGHTON BUZZARD STATION, 41 miles from London.	Leighton Buzzard.
	Excavation.	
	Linslade Tunnel.	
	Embankment.	Woburn.
Stoke Hammond.	BLETCHLEY INTERMEDIATE STATION, 46¾ miles.	
Bletchley.		Fenny Stratford.

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Left to Birmingham.	*Line of Railway.*	*Right to Birmingham.*
	Denbigh Hall Bridge, over the Holyhead road.	
	Deep Cutting.	
	Bridge of three arches.	
Stony Stratford.	WOLVERTON STATION,	Newport Pagnell.
	52½ miles from London.	
	Embankment over the Ouse Valley.	
	Wolverton Viaduct.	
Grafton Regis.		Hanslope.
	Enter the County of Northampton.	
		Ashton.
Stoke Bruern.	ROADE INTERMEDIATE STATION,	Roade.
	60 miles.	
	Blisworth Excavation.	
Towcester.	Pass over lofty bridge, leading from Towcester to Northampton.	Northampton.
Gayton.	BLISWORTH STATION,	Rothersthorpe.
	62½ miles from London	
	Embankment.	Bugbrook.
Stowe.	Stowe Hill Tunnel.	
	Weedon Embankment	Floore.
	Weedon Viaduct.	
	Pass over Canal leading to Government dépôt.	

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Left to Birmingham.	*Line of Railway.*	*Right to Birmingham.*
Military Dépôt.	WEEDON STATION,	Weedon.
	69¼ miles from London	Brockhall.
	Bridge under Mail Road.	
Daventry.	Bridge over Canal at Buckby Wharf.	Long Buckby.
Braunstone.		Watford.
	CRICK INTERMEDIATE STATION, 75½ miles.	Crick.
Kilsby.	Kilsby Tunnel.	
	Enter the County of Warwick.	
Hillmorton.	Bridge over Oxford Canal.	Yelvertoft.
	Embankment.	Clifton.
	Junction of Midland Counties Railway.	
Rugby.	RUGBY STATION,	
Dunchurch.	83¼ miles from London	Lutterworth.
Bilton.	Embankment over the Valley of the Avon.	
	Church Lawford Cutting.	Brinklow.
	Brandon Embankment	
Wolstone.	Avon Viaduct.	Brandon.
	BRANDON INTERMEDIATE STATION, 89¼ miles.	
	Sow Viaduct.	Combe Abbey.
Witley Abbey.	Cutting.	
	Sherborne Viaduct.	

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Left to Birmingham.	*Line of Railway.*	*Right to Birmingham.*
	Pass over Mail Road.	Nuneaton.
Stoneleigh Abbey.	Coventry Excavation.	
Kenilworth.		
Warwick.	COVENTRY STATION,	Coventry.
Leamington.	94 miles from London.	
	Bridge under Kenilworth Road.	Allesley.
	Excavation.	
	Embankment.	
	Beechwood Tunnel.	Berkswell Hall.
	Pass under Kenilworth Road Bridge.	Meriden.
Temple Balsall.	Berkswell Cutting.	
	Pass under several fine Bridges.	
	Embankment.	
Henley-in-Arden.	Bridge over the Blythe.	
	HAMPTON INTERMEDIATE STATION, 103 miles.	Stonebridge.
	Bridge under Mail Road.	
Solihull.	Embankment.	Coleshill.
Yardley.	Pass for two miles through the County of Worcester, and again enter Warwickshire.	Castle Bromwich.
	Excavation.	
	Embankment.	

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Left to Birmingham.	*Line of Railway.*	*Right to Birmingham.*
Moseley.	Pass under several Bridges.	Erdington.
	Excavation.	
	BIRMINGHAM STATION,	
	112½ miles from London.	

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CONTRACTS, EXTENT, COST, &c.

Contract.	Length.	Contractor.	Contract Price.	Revised Estimate.
	Miles		£	£
Euston Extension.	1	W. and L. Cubitt	76,860	91,528
Primrose Hill . .	5¾	The Company	119,987	280,014
Harrow	9½	Joseph Nowell & Sons.	110,227	144,574
Watford	5	Copeland and Harding	117,000	138,219
King's Langley .	2¼	W. and L. Cubitt	38,900	57,386
Berkhampstead .	4½	W. and L. Cubitt	54,660	65,002
Aldbury	2½	W. and L. Cubitt	16,694	25,134
Tring	3	Assignees of Townshend	104,496	144,657
Leighton Buzzard .	7½	James Nowell	38,000	43,162
Stoke Hammond .	3⅞	E. W. Morris	39,303	42,345
Bletchly	3⅜	John Burge	54,500	61,071
Wolverton . . .	5	The Company	67,732	107,765
Wolverton Viaduct	⅛	James Nowell	25,226	28,964
Castlethorpe . .	4½	Craven and Sons	49,735	71,873
Blisworth . . .	5	The Company	112,950	184,301
Bugbrook . . .	5	John Chapman	53,400	65,013
Stowe Hill . . .	1¼	John Chapman	23,050	31,536
Weedon	1⅝	W. and J. Simmons	26,150	31,442
Brockhall . . .	3⅛	J. and G. Thornton	34,157	50,583
Long Buckby . .	3⅝	J. and G. Thornton	42,582	48,256
Kilsby	1⅜	The Company	98,988	291,030
Rugby	5⅛	The Company	59,283	93,384
Long Lawford . .	3¼	W. and J. Simmons	20,330	25,893
Brandon	4¼	The Company	40,000	55,090
Avon Viaduct . .	1-16	S. Hemming	7,979	8,621
Coventry . . .	7¾	Co. & W. & J. Simmons	101,700	150,496
Berkswell . . .	4½	Daniel Pritchard	53,248	62,738
Yardley	7½	Joseph Thornton	68,032	78,131
Saltley	1⅞	James Diggle	32,878	38,707
Rea Viaduct . .	⅛	James Nowell	13,644	15,505

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GENERAL RESULTS OF TRAFFIC FOR ONE YEAR.

(EXTRACTED FROM THE MINUTES OF EVIDENCE GIVEN BEFORE THE COMMITTEE OF THE LORDS, 1832.)

Means of Transit.	Number of Journeys of 110 Miles.	No. in each.	Total carried.	Expence by the present Means.		Expence by the Railway, 112½ Miles.	Time.	
							At present.	By the Railway.
Four-horse Coaches counted on the Road	21,641	9	Passengers. 194,769	316499,6	£	Passengers at 2d. per Mile each.	Hours.	Hours.
Two-horse ditto do. do.	4,221	6	25,326	44003,9		—		
Pairs of Post Horses do. do.	7,622	3	22,866	83942,0		£		
Commercial Gigs do. do.	5,569	1	5,569	11138,0	455,480	227,819		
Contingent Coaches, from Stamp Office Returns . .	23,745	9	213,705	347270,6				
Proportionate number of Pairs of Post Horses.	6,998	3	20,994	76978,0			12½	5½
Ditto of Commercial Gigs . .	5,113	1	5,113	10226,0	434,474	219,827		
		Cwt.	Tons.					
Private and Stage Vans, counted on the Road	1,600	{18 / 30}	2,315¼	18522			30	
Stage Waggons do, do. . .	3,665	70	12,827½	76965			60	
Errand Carts do. do. . .	11,543	10	5,771½	34629	130,116	58,821	40	
		Tons.						
Boats, counted on the Canals .	11,131$\frac{7}{11}$ 149 Miles.	11	122,428		506,070	286,940	72	
					1,326,143	£793,407		

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