

carriage, as a wealthy man, he would walk home with his umbrella. It was upon an occasion of this kind that he met with the accident which crippled him during his later years, and no doubt hastened his death. Yet, when his bank was robbed, he did not show the least regret for his loss, only an intense desire to discover the plunderers.

His almost open breakfast parties, of three or four artists or literary men who had the *entrée*, were pleasant enough, from the news and gossip gathered into them; and his dinners, wisely limited in the number of the guests, abounding in luxuries, usually graced by distinguished individuals, and sometimes by most interesting groups, must be classed among those high social enjoyments which few have the means to command, and fewer still know how to accomplish and appreciate.

His personal appearance was extraordinary, or rather, his countenance was unique. His skull and facial expression bore so striking a likeness to the skeleton pictures which we sometimes see of Death, that the facetious Sydney Smith (at one of the dressed evening parties I have spoken of) entitled him the "Death-dandy!" and it was told (probably with truth) that the same satirical wag inscribed upon the capital portrait in his breakfast room, "Painted in his life-time."

Withal, Rogers possessed refined and elegant tastes; and his cultivation of poetry exalted his mind above its inherent worldliness, as far as was possible in one devoid of the nobler influences which transform and elevate humanity.

### RAILWAY TUNNELS.

In the early history of railway enterprise, it was imagined by alarmists that to be carried through cavernous apertures deep below the surface, excluded from the light of heaven, and breathing an atmosphere unventilated, while polluted with subterranean effluvia, with combinations of smoke and steam, would dangerously shock the nerves of passengers and be prejudicial to health. A committee of physicians, surgeons, and chemists was therefore appointed to examine the tunnel at Primrose Hill, then in progress, who pronounced the apprehension perfectly groundless—a decision which experience has amply confirmed. The railway tunnels have been constructed at a very varying expense: from £20 to £160 per linear yard, owing to the different character of the ground—stiff clay, loose sand, and rocky strata, easily worked or of a very hard texture. Tunnelling is frequently the cheapest through rock, as blasting is practicable, and the expense of a brick lining may sometimes be saved. The Penmaenback tunnel, on the Chester and Holyhead railway, is driven through basaltic rock, which entirely supports itself. But the Penmaenmawr tunnel, on the same line, though cut through greenstone, required to be lined throughout with masonry; and the Bangor tunnel, which was at first considered sufficiently solid to support itself, from the hardness of the stone through which it is driven, has been lined with brick, owing to symptoms of not being able to withstand the action of the weather. Shakspeare's

Cliff, near Dover, presented peculiar difficulties to operations of this kind, arising from the crumbly texture of the chalk, and the mass being traversed by fissures; but a very beautiful tunnel was constructed, and one of the firmest ever made—a double one, formed of two pointed parabolic arches, soundly lined, so that the superincumbent weight has a central support.



KILSBY TUNNEL.

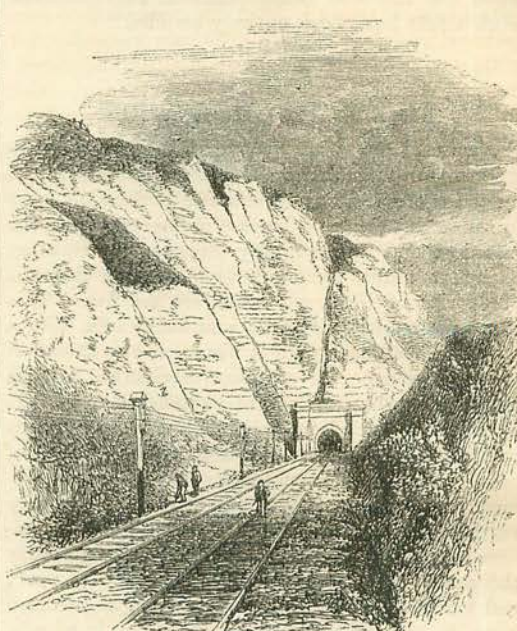
In making long tunnels, unexpected ground is sometimes reached, notwithstanding careful experimental borings beforehand to ascertain the strata; and the contractor finds that all his calculations have been based upon wrong premises. This was remarkably exemplified in the instance of the Kilsby tunnel, the longest on the line between London and Birmingham. The strata beneath were found by numerous borings to be the shale of the lower oolite, and the execution of the work was contracted for at £90,000. During its progress, it was discovered, to the astonishment of the engineer, and the dismay of the contractor, that a quicksand beneath a bed of clay occupied some twelve hundred feet of the line of the tunnel. No sooner was it tapped, than the water poured out in apparently exhaustless quantities, as if from a subterranean lake. The obstruction seemed perfectly insurmountable. Appalled by it, the contractor took to his bed; and, though relieved by the company from his engagement, he languished and died. The total abandonment of the work was contemplated, when the engineer determined to attack the difficulty with formidable means. But it required eight months to carry off the water, though thirteen steam-engines, two hundred horses, and twelve hundred and fifty men were employed in the task; and the drainage was carried on night and day at the rate of eighteen hundred gallons a minute. Instead of being executed for £90,000, the cost of the tunnel was about £300,000. Two years and a half were occupied in completing it. Thirty-six millions of bricks were consumed in the lining, which, according to calculation, would nearly make a footpath a

yard wide from London to Aberdeen. The traveller now passes through the excavation without any sensation of damp, or other experience of change but the common one from sunshine to shade. Besides small shafts, there are two immense openings to the sky, sixty feet in diameter, for ventilation and light. Strange it is to mark in either the clouds flitting above the huge vertical tube, with the two little

head tunnel, on the Manchester and Sheffield railway. This is the longest yet constructed, exceeding three miles, but inferior to most in its transverse diameter. It is driven through limestone and millstone grit, at the vast depth of six hundred feet below a bleak heathery moor, near the junction of the three counties of Derby, York, and Chester. Upwards of one hundred and fifty-seven tons of



OLIVE MOUNT CUTTING.



ABBOT'S CLIFF TUNNEL.

arches of day-light at the extremities of the horizontal hollow; or to stand back in the recess, while a train confuses everything as it passes with its smoke, steam, and thunder. Residing in the neighbourhood the whole time the work was in process, we had many opportunities of walking through, and collecting oolitic fossils from the labourers.

A similar difficulty upon a smaller scale was encountered and overcome by the same means, during the construction of the Box tunnel, between Chippenham and Bath. It passes for a considerable distance through freestone; and from fissures in the rock the water poured so copiously that the single steam-engine employed to carry it off proved insufficient to the task. One division of the tunnel was completely filled; and the shaft also to the height of fifty-six feet. After the works had been suspended for some months, a second engine of fifty-horse power was added to the former, and by vigorous efforts the water was pumped out. Another irruption took place; the engines were again set to work, and the water was drained off at the rate of thirty-two thousand hogsheads a day. The Box tunnel passes in one place below the surface of the hill at a depth equal to the height of St. Paul's. For two years and a half, a ton of gunpowder and a ton of candles per week were consumed in blasting and lighting, and thirty millions of bricks were required for lining.

But a still more stupendous work is the Wood-

powder were used in blasting; and most of the excavated rock had to be hoisted to the surface from the depth stated.\*

The dimensions of some of the principal railway tunnels are as follows:—

	Length in Yards.	Height in Feet.	Width in Feet.
Edinburgh and Granton . . . . .	1001	17	24
Primrose Hill, near London . . . . .	1250	25	22
Shakespeare's Cliff, near Dover . . . . .	1430	30	34
Merstham . . . . .	1706	—	—
Leicester and Swanmington . . . . .	1760	13½	13½
Watford, London and Birmingham . . . . .	1830	—	—
Lime street . . . . .	2000	19	25
Abbot's Cliff, near Dover . . . . .	2206	25	24
Edgehill, Liverpool and Manchester . . . . .	2216	16	23
Kilsby, London and Birmingham . . . . .	2423	27	23½
Manchester and Leeds tunnel . . . . .	2860	21½	24
Box tunnel, Great Western . . . . .	3123	27	25
Woodhead, Manchester and Sheffield . . . . .	5300	—	—

ABBOT'S CLIFF TUNNEL is a type of the class of tunnels formed by means of horizontal galleries instead of vertical shafts. In this case the galleries were driven from the face of the cliff. The tunnel is through chalk, and is over one mile and a quarter long. On fine days the coast of France may be observed by the traveller through gaps in the embankment.

OLIVE MOUNT CUTTING, near Liverpool, is one of the most formidable cuttings in the kingdom. It

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

is entirely carried through rock, is two miles long, and is in some parts 100 feet deep. In order to make it, 430,000 cubic yards of rock had to be removed. Seen from above, it has the appearance of a tremendous defile, and is resounding almost every minute with the thunder of the frequently passing trains between Liverpool and Manchester. Had it not been for the opposition of certain landowners when the line was being planned, this immense work might have been entirely avoided.

#### TO AND FRO IN LONDON.

FOR more than twice seven years it was my lot to walk to and fro, for three long miles, daily through a portion of the city and suburbs of London, ever in the same unvarying track—going one way in the morning, and retracing my steps in the evening, or in the night, at any hour when the despotic necessities of business would set me free. This perpetual transit forwards and backwards, like a weaver's shuttle, though it winds off the thread of a man's existence in a rather mechanical way, is not exactly what one might suppose it to be. It is neither so varied in point of interest as might be expected in a city of two and a half millions of people, nor is it so monotonous and void of excitement as one might fear to find it. It is not very varied, because the business of life is with all business men a routine, the same thing, or very nearly the same thing, day by day and year by year; and hence, he who walks to his labour at a stated hour in the morning will encounter hundreds, and, if his route be a long one, perhaps thousands, who are travelling on the same mission. In time he will begin to know the majority of the faces he meets, and to be struck with the wonderful regularity with which they appear at a particular spot at a particular moment, and that for months together.

The regular business faces, however, that one is accustomed to meet are hardly so interesting as the perpetual fixtures which one passes in these morning walks. There are the same peripatetic tradesmen, the same beggars, the same crossing-sweepers, the same impostors whining or bellowing psalm-tunes for alms, the same hurdy-gurdy and piano-grinders, and the same vagabonds, though these last use up a neighbourhood much quicker than any class of regular professionals, and betake themselves elsewhere. It is amusing to note the cool effrontery of the whole impostor races; having levied black mail on you once or twice, they no sooner recognise you as a regular passenger—as one who, like themselves, has his own living to get—than they make you free of the road, and cease their importunities ever afterwards. They know you and understand you, and know that you know and understand them; and if thenceforth you happen to exchange a glance with them, you perceive that it is on their part one of intelligence, as if there existed a mutual understanding between you—which indeed there does, after a sort.

How many personal and domestic histories have I read as I walked to and fro in London's streets

during those long years! how many comedies and how many tragedies have I witnessed from their first scenes to their last! How many commercial bubbles have I seen blown and burst along that line of route! how many promising speculations entered on which failed! how few which succeeded! I have marked the rise and gradual growth of prosperity—the exultation of the prosperous—then the advent of adversity in the shape of pecuniary difficulty, or of financial panic—or perhaps of disease and disablement—and then the final decline and disappearance of the actors from the stage. I have seen merry weddings, to the music of merry bells, and joyous embarkations on the sea of life, followed by disasters and ruin, the sudden breaking up of households and the scattering of families; and I have seen also—as, how should I fail to see it?—the sure reward of prudence, diligence, and integrity, in the increase of this world's goods and the acquirement of reputation and respectability. I have noted also, in the same long course of time, the growth and fortunes of new neighbourhoods as well as new families. Thousands of acres which, when I began my daily travels, were either waste lands or grazing meadows, brick-fields, market-gardens, or drying-grounds, are now swallowed up in the maw of the omnivorous Babylon, are covered with dwellings of all kinds and degrees, and are swarming with hundreds of thousands of inhabitants. Not all of these new districts have turned out what their originators intended them to be. In some places where a dead set was made at gentility, traffic has crushed itself in and swept all genteel pretensions aside, usurping the field for itself; and on other sites the contrary has come to pass—as though brick walls and stone pavements, as well as human beings, had an obstinate will of their own, and would have their way.

Going always city-wards at a stated hour, but returning at all hours of the twenty-four, I have seen the multitude under all its aspects; and in the dead of the night as well as in broad daylight I have faced the wealthy and gay, the houseless and destitute, the honest and virtuous, the vicious and depraved, the lost and the abandoned. Among the million faces which have passed from my recollection, there are a few which haunt me after the lapse of years, shining out distinct and clear amidst the crowd of dim undistinguishable shadows. I never knew their names, and never shall know them, but they have inscribed indelibly their images upon my mind. There was, for instance, "the last pair of Hessian boots," whose owner bore an evergreen face at three-score and ten. I used to overtake the tasseléd chaussure of a morning, on approaching one of the inns of court, and on passing the wearer generally heard him reciting to himself some oratorical deliverance full of legal phraseology, from which I inferred, what was doubtless the case, that he was a barrister in good practice, and that he rehearsed his addresses to the jury as he walked to his office. One morning I observed him stoop rather stiffly and pick up a sovereign; he held it openly between finger and thumb, to see if any one would claim it, and as I passed him begged me, if I heard of the loser, to give him or her the card of