

graphical and commercial view of the world, with perhaps a little map-drawing. In the present day, Geology, Astronomy, Mathematics, Meteorology, Botany, and very likely some other sciences, are brought to bear on the subject, and it would be difficult to find any modern examination paper on Geography which did not contain some allusions to "doabs," "cyclones," "moraines," "water-sheds," "climatic variations," "heights of snow-line," "rain-fall," and hundreds of similar things, which were not mentioned or dreamed of in the ordinary school-books of twenty or thirty years ago. With Grammar, too, it is the same. To most of us the grammar we learnt at school consisted of a knowledge of parsing and the main rules of syntax, and if one were well up in these two branches he was considered a very fair grammarian, and quite *comme il faut*; but now-a-days one must know, in addition to these, the analysis of sentences, the history and derivation of peculiar words, the history of the English language and its connection with others, with perhaps Grimm's Law and a knowledge of Anglo-Saxon into the bargain.

I do not, of course, mention this widening of the area covered by these subjects as a cause for complaint, for it is, on the other hand, rather a fact to be proud of, and regarded as a sign of the increase of knowledge in the present day. I simply have drawn attention to it in order to impress upon any of my readers, who may be interested in home teaching, the importance of seeing that those young people with whom they have to deal should, in the first place, waste

no time in learning things useless to them at their ages; in the second place, learn thoroughly all the mechanical and parrot-like acquisitions, such as tables and dates; and in the third place, learn carefully and well all that they do learn.

Before concluding, I have just a few words to say about a subject which, though not a school one, is still very important in its bearing on the happiness and welfare of a child in after-life, when it is sent away from home to school. I refer to the *early* inculcation of obedience. It is, I think, mistaken kindness to allow a child to constantly have its own way in opposition to its elders, to let it grow up wilful and disobedient, when we know that such habits, though comparatively easy to check in a very young child, require far more stringent remedies for their eradication as the child grows older, and therefore entail a correspondingly greater amount of severity.

There is one more difficulty, too, which besets the generality of parents—the choice of a school for their children. There are, of course, particular schools, situate in various parts of the country, which are peculiarly suitable, and offer special inducements to certain classes of parents.

The difficulty is, however, for parents to find out these schools, and to know whether they come under the category of those benefited. In solving this problem they will receive very substantial help from the perusal of "The Educational Year Book,"* which is filled with all sorts of information relating to our schools, colleges, and universities.

W. H. H., B.A.

CLEVELAND, PAST AND PRESENT.



ILBERFORCE spoke once of the change which the introduction of the iron manufacture into a district produced in it, and of that change there has been in this century no fuller proof than that furnished by Cleveland and the district to which

this name is applied by the iron-masters. Before the utilisation of the vast iron deposits of the north-east of Yorkshire, the district of Cleveland was one of the least known in the country; it was unpierced by railways; there were no great industries carried on in it; its population was sparse, and its agricultural products limited in proportion to its great extent. There were parts of it which were known for their beauty, or made

memorable by association; but the inner portion was isolated, and long rolling moors and high hills, interspersed with fair little valleys, occupied no small portion of its space. The valley of the little river Esk had been long one of the haunts of artists, and its pleasant woods like Mulgrave, waterfalls such as Thomasin "foss," the bold bluffs that shut off the purple and green of the moors from the well-cultivated little dales, as well as the one or two castles or mansions in the district, had formed the subject of many a sketch; whilst the picturesqueness of Whitby, with its grand old abbey placed high above the narrow streets of the old town, the little harbour, and the white timbers of the vessels building, "spectral in the moon's pale light," had formed the suggestive points of many a painting. Far to the north-east, near the little straggling village of Old Saltburn, was the mansion known now as the Old Hall at Marske—the tall trees framing which, the dim grey stones, and the antique windows and massive doors tell of the troublous times before the Civil War, when it was built. South from this was the hall where Sterne visited, and from which the great family of De Brus sprang, to give kings, bishops, barons, queens, princesses, duchesses, and dignitaries innumerable.

Not far away was the pleasant town of Guisborough

* London: Cassell, Petter, Galpin & Co.

with the noble ruins of its Gothic priory, whilst nearer the sea, the ancient castle of Kilton was dismantled, and moss-grown walls and fosses alone define the site of a structure once deemed impregnable. There were, in addition to these mementoes of the past glory of Cleveland, a few towns such as Lofthouse, where the industries of the past were decaying; a few villages scattered along the bases of the hills, and hamlets and farmsteads solitary, with fishing villages like quaint old Runswick or Staithes. It had scenery diversified by hill, dale, and rolling moor; its inhabitants were a hale, frugal people, addicted to old-world customs, and life passed in it with little change from year to year. Indeed, though fifty years ago railways entered it, and a small port was placed at its northern extremity, it is within the last thirty years that there has been produced the change which Wilberforce speaks of—a change attributable to the great industry he had known aforetime effecting such a change.

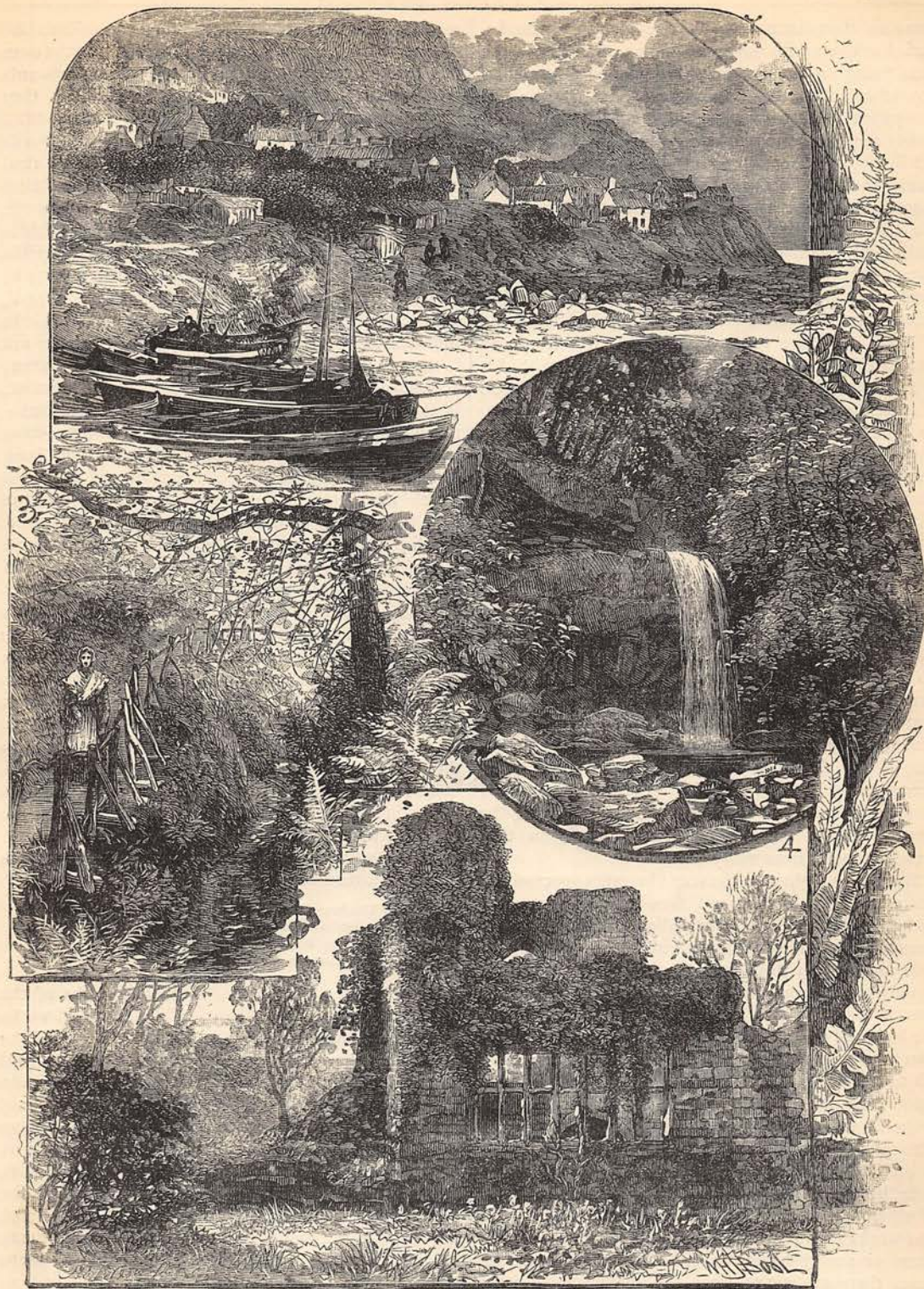
At the present time there are large sections of Cleveland which may be described as honeycombed in the search for iron ore. And it is this that gives the duality of appearance to the iron-mining district. Above ground, there are to be seen the mining villages, the machinery, tipping cradles, ventilating machines or chimneys, long lines of railway trucks and sidings, and repairing shops of joiners and smiths, and the frequent puffs of the engines mark the courses of the railways. But down below there are busier scenes. Tunnelled into the hill, or sunk into the plain, are great galleries or shafts, many fathoms long or deep. From these diverge other galleries; and again from these, working-places where the miners are blasting, hacking, drilling, and bringing out the ironstone from its thick seams. In these mines, or about them on the surface, work 8,000 men. The work is laborious, but on an average the accidents are fewer and the loss of life much less than in coal-mining.

In each of the "boards," or working-places, two miners work. Into the face of the ironstone, which is in seams many feet thick, the workmen drill a triangular hole with an iron rod, and this hole is filled partly with gunpowder, to which a fusee is attached, and by the explosion of this the stone is loosened. If needed the masses are further broken, and then loaded into the small mine-tubs to be sent to the mouth of the mine, where it is "tipped" by the "cradle" into the railway waggons. As the working proceeds wooden props are inserted to support the roof; and when the working-places are wrought into one another, the intervening pillars of stone are also worked out, and that portion of the roof is allowed to sink in. The men are paid by the ton, and the rate of pay rises or falls, by an automatic sliding scale, with the price of the pig-iron which is smelted from the ironstone. In this mining part of the district there is little visible of the vast work that is progressing; and only an occasional ventilating shaft, the long trains of waggons, and the stereotyped mining villages give indications of the human bees below, of the miles of mine-passages, and the cities of squares and streets that are being cut down in the deep dark mine.

Following the track of the trains of ironstone, we come into the region where they meet the other raw materials that are used in the production of pig-iron. Leaving out of the question that part of the iron produced in the great district of the North from iron ores brought into the district, it may be said that annually about 2,000,000 tons of pig-iron are made from the native ores. Over 6,000,000 tons of ironstone, the great bulk of production of the district we have left, are taken to produce this iron. And, roughly speaking, about 4,000,000 tons of coal are used to smelt it, whilst there are needed about 1,000,000 tons of limestone to be used as a flux in the operation. Before the first two materials are fit for the blast furnace, the ironstone is calcined—roasted—in kilns, and the coal is converted into coke in the beehive-shaped ovens that are so familiar a sight to the traveller on the railways in the interior of South Durham. On and near Teesside, there are erected over eight-score blast furnaces, huge and costly erections, towering up from seventy to over one hundred feet in height, and in the words of Hood—

"—casting upwards, day and night,
Flames of red, and yellow, and white."

To over one hundred of these great smelting furnaces, the ore, coke, and limestone are conveyed, and in proportions such as those indicated, they are raised to the head of the furnace, and there poured into an interior heated more than the "seven times heated" furnace of old. In these great furnaces, as the materials descend, they acquire first a dull red, then full red, and then at the point of fusion a very bright red; finally, close to the point where the furnace is tapped, a white heat is reached, and at length the glowing liquid issues into the sandy furrows that are made to receive it at the base of the furnace. This, cooled in its sandy bed, is the pig-iron that is afterwards "puddled" in the puddling furnaces, and made malleable, or conveyed to the Bessemer converter to be quickly transformed into steel. Its production and manipulation is the great industry of the land of Cleveland, which realises the description of old, a "good land . . . a land whose stones are iron." In its production and manipulation an army of 20,000 workers find employment, in addition to the coal-miners and limestone quarrymen of Durham; and in the provision for that army, and in the transit of their production, there is the cause of the vast change in the population of the once secluded district of Cleveland, and in their operations a physical change that presents itself in striking guise to the traveller in the North. In the smelting districts there is a scene worthy the painting of a Turner. It is a strange scene by day, a weird one by night. By the sides of the railways that traverse it, and on or near the banks of the river Tees, there are scattered these tall smelting furnaces, little varied in shape, rising like tall dark columns, at times with the interspersed guides up which the "lift" for the raw materials is moving; with spiral staircases wound round, or with a brattice between each couple of furnaces, strongly like that up which a coal-pit cage swiftly slides. From the mouth of the



CLEVELAND, PAST AND PRESENT.

1. RUNSWICK.

2. THOMASIN "FOSS."

3. IN MULGRAVE WOODS.

4. MULGRAVE CASTLE.

(From Photographs by Mr. W. STONEHOUSE, of Whitby.)

furnaces there intermittently rise clouds of smoke, varied at times with tongues of flame, whilst from the base "slag" runs in a glassy stream, or a sparkling flow of white-hot metal runs through the furrows of the yellow sand, irradiating and colouring it as it slowly acquires solidity in the grooves that have been cut for it, and darkening as it cools through all the shades from a reddish-white to a dull grey. Here and there amongst these smelting furnaces and amongst the stout-built engine-houses, that are filled with a hissing of steam and a rumbling of machinery, are some of the rolling mills and forges. In the long low sheds, with the stacks from puddling furnaces rising thence, are the makers of malleable iron. Here is one of these puddling furnaces, charged with iron and watched by its attendant puddler, armed with his rabble or paddle, with which the molten metal inside is at the proper period brought into a mass that may be seized, drawn forth, and conveyed, dripping fiery drops as it is taken, to one of the sounding steam-hammers, where the white ball is pounded and beaten, shedding showers of sparks, and recalling that passage of the poet—

"A hailing fount of fire is struck by every squashing blow ;
The leathern mail rebounds the hail ; the rattling cinders strew
The ground around ; at every bound the sweltering fountains flow."

The furnaces, dull without, but seen through the orifices to be glowing within, the stacks of chimneys vomiting streaks of smoke, or with flames leaping up to the "damper," the glowing balls of molten metal hurried hither and thither, and the trailing serpents that writhe, red-hot, between the rolls where the iron is shaped into bar, angle, or rail—these form a picture that in the day time is rather startling, when it is accompanied by the shrill whistles of locomotives, the creaking of waggons, and the continued "bass" of the steam-hammer, and illuminated by the glow that spreads around from many a fire.

But it is at night that the scene becomes spectacular. On earth below a thousand fires light up the scene, and are reflected in the skies above. The sky along Tees-side for miles is lit up with lurid gleams that fade and rise as the flames they reflect fall or bound upwards from furnace-throats. Along the route where iron is made or manufactured, these sky reflections are lurid red ; but when the scene of the conversion of iron into steel is reached, they change to a silvery white, flickerless, but are periodic in intensity. And below expanding in this new Black Country a weird scene is visible, and that for miles by river or rail. The railway traveller is hurried through a route which is on either side hemmed in with waggons of coal, coke, ironstone, and limestone, impinged on by stacks of pig-iron, and close to which ever and anon furnaces and works protrude their dark heads, with tongues of flame or smoky haloes issuing thence, whilst at the bases there are glows from the molten metal that throw into relief the figures of the attendants. It is a scene such as that described by Dante, when he speaks of the fierce light that "through prevailing darkness" shone. Through the interstices between black waggons and great piles of iron, the ruddy works are

seen ; pencils of fierce light striking across from the orifices in the doors of puddling furnaces, through even the stacks of their chimneys, and darting upwards through the half-closed "damper," over which they form a fiery crown. From the taller tops of the blast furnaces, tongues of flame leap alternately with clouds of light smoke ; and when the converters of the steel works are seen sending forth out of the craters of these egg-shaped volcanoes, a shower of flame and sparks that leap uninterruptedly upwards, giving kaleidoscopic effects in colour, whilst throwing into relief the whole of its neighbourhood, some idea of the route by night is seen, though the deeper darkness beyond, with its mysterious star-lights, is not appreciated. In the denseness of the north is the land where salt is being sought, and in that to the south, where occasional jets show the presence of mine or furnace, is the mining land left behind. These operations—the mining, smelting, and manufacturing of iron—have changed this once-isolated part of the northern land. They have given it industries the commercial value of which can scarcely be tabulated. Yearly, the iron that is sent out of the district in its crude state is worth £1,250,000, and that retained is, when further manufactured, worth £4,000,000 ; whilst the value of the steel produced reaches more than £1,250,000 additional ; so that in the production and manipulation of it, so far as the crude iron, or the metal in a state fit for ship or railway construction is concerned, there is a yearly value of from six to seven millions sterling. But there is more than this : there are employed in that production and manipulation in mine, furnace, forge, and foundry, over 25,000 persons, and it is in these, and in the allied and dependent trades of ship-building and of transit, that the great bulk of the producing labour is employed, apart from that of the tributary workers.

In the sights that the American Quaker poet has pictured in the lines—

"The forges blow, the hammers all are ringing,
Beneath its smoky veil
Hard by, the city of his love is swinging
Its clamorous iron flail"—

in these sights and scenes, in the iron ribs of the vessels that slowly take shape, in the chemical works that breathe out clouds of stife, there are signs of the growth of what is inadequately called the Cleveland District in the past two-score years. It has come out into the fierce light of prosperity ; its agricultural lands are seamed now with the mounds of slag, its rivers and harbours are belted with factories ; in its once-quiet valleys the rush of the locomotive is heard, and the pleasant rural land is now dotted with the palaces of the iron-masters. Its chief town has adopted the motto of "Erimus," and that is the one that may be applied to it as a district. Its commerce "sweeps onward," and there are variations as great and as rapid in its industries, and in the fortunes of some of those who have been its foremost men, as in that humanity that Lowell's strong verse has told us of. So far its growth has been American in rapidity, but it hopes that in the future it may be British in stability.