A TOUR to the CAVES,
IN THE ENVIRONS OF
INGLEBOROUGH AND SETTLE,
IN THE
West-Riding of Yorkshire.

WITH
SOME PHILOSOPHICAL CONJECTURES ON THE DELUGE,
REMARKS ON THE ORIGIN OF FOUNTAINS, AND
OBSERVATIONS ON THE ASCENT AND DESCENT OF
VAPOURS, OCCASIONED BY FACTS PECULIAR TO
THE PLACES VISITED.

ALSO
A LARGE GLOSSARY
Of old and original Words made use of in common
Conversation in the North of England.

IN A LETTER TO A FRIEND.

---
Of antres vast, and deferts idle,
Rough quarries, rocks, and hills, whose heads touch heaven,
It was my hunt to speak.

Shakespeare's Othello, Act I.

THE SECOND EDITION, WITH LARGE ADDITIONS.

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1781.
TO
THOMAS PEARSON, Esq;
OF
BURTON IN KENDAL, WESTMORELAND.

SIR,

THE amusement you have received in visiting the natural curiosities in the neighbourhood of Ingleton and Settle, in company with different parties of gentlemen of approved taste and knowledge, who entertained the same sentiments with yourself, hath induced me to draw up a plain narrative of one of our excursions, in a letter to a friend, by way of an appendix to the Guide to the Lakes. This I thought would not be unacceptable to the southern parties, who, for their summer amusement, make the fashionable tour of the lakes. The caves may be visited in their return without inconvenience to most of them; and many new and entertaining scenes of nature, with some large and elegant towns viewed, by taking the Yorkshire road through Settle, Skipton, &c. I undertake this task with the more alacrity, as a great part of my infancy and youth was spent amidst this collection of natural curiosities; The partiality that is acquired by an early acquaintance with any
any objects, excites in us a desire to have their beauties and excellencies seen and admired. I cannot but lament, while I am writing this short account, that I have not your affiance in pointing out to me the several striking traits and peculiarities in these scenes, most deserving the notice of a which, by their familiarity, are not apt to engage the attention of a native. I have taken, however, the liberty of addressing this short description to yourself, as in some measure entitled to your protection, the originals having engaged so much of your attention and admiration. What is admired by a gentleman of refined and approved taste, who has not only seen every natural curiosity in Great Britain, but who has visited, oftener than once, every quarter of the globe, should be made as public as possible, for the amusement of the speculative traveller and natural historian.

If this attempt to inform and amuse fails of its wished for effect, from the writer’s inability in the modern descriptive style, it is hoped the desire to please will claim some indulgence for

Sir, your most obedient,

and humble Servant

J. H

April 25th, 1780.
ADVERTISEMENT.

The quick sale of the first edition of this work has induced the author to revise the whole for a new impression. In this edition the description of each cave is more exact and particular; several other caves have since been visited and described; to the philosophical conjectures on the deluge, many observations are added on the origin of fountains, the ascent and descent of vapours, and other phenomena in meteorology, from remarks on facts peculiar to the nature of the country in which the caves are situated. A large glossary of above seven hundred and fifty, mostly of old and original words, now current in common conversation in the north of England, is added by way of postscript, which perhaps may be acceptable both to natives and strangers.
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A TOUR
A TOUR TO THE CAVES.

SIR,

ACCORDING to promise, I sit down to give you an account of our summer's excursion. After having made the tour of the lakes, we were induced to proceed from Kendal by Kirkby-Lonsdale, Ingleton, Chapel in the Dale, Horton, and Settle, in order to see the caves and other natural curiosities in those parts of the West-riding of Yorkshire. I must own this second part of my tour pleased me more than the first, being peculiarly adapted to my taste for natural history, as also for the extraordinary and terrible. Some may be as much entertained with the profound, as others with the lofty; and some may be as much amused with the sublime, as others with the beautiful. This was the humour of my genius,
genius, and here it was abundantly gratified. You have read so many accounts already of the beauty and variety to be seen among the lakes of Lancashire, Westmorland, and Cumberland, and heard so much in praise of them from the reports of travellers, that I can add nothing further to embellish their descriptions: I shall therefore pass over this part of our journey in silence, having met with no adventures that were peculiarly amusing, and confine my letter to our route through a country not much explored, or however not yet publickly described. Our amusements were mostly in the extremes, either on the tops of high mountains, or below the surface of the earth, in caverns and subterranean paths, seldom visited by the curious and speculative traveller.

About six o'clock, one morning in June, we set off from Kendal, and after travelling about a dozen miles, along a good turnpike road over Endmoor, and Cowbrow, we arrived at Kirkby-Lonsdale, soon after eight. About the mid-way we left the little steep, white mountain, Farleton-knot, on the right about a mile. It is all composed of solid limestone, and is three or four hundred yards in depth. Those who have seen both, say, that on the west side it is very like the rock at Gibraltar. There were several good mansion houses by the road side, which, at the beginning of this century, were inhabited by a substantial set of yeomanry and country gentlemen, the most useful members of a community: They are now however mostly let out to farmers; the desire of improving their fortunes in trade, or the pleasure of living in towns, have induced the owners to leave them:—Reveries of fortune
tune or new attachments, have caused many to sell them, after they had been continued many centuries in their families. **Kirkby-Lonsdale** is a neat, well paved, clean town, ornamented with several genteel houses, adjoining to some of which are elegant gardens. The houses are covered with blue slate, which has an agreeable effect on the eye of a stranger. A small brook runs through the market street, which is useful and commodious to the inhabitants; afterwards it turns several mills in its steep descent to the river Lune. The church is a large and decent structure. The roof is covered with lead, and supported by three rows of pillars. The steeple is a square tower, containing six bells; the music of which we were entertained with at nine o'clock, they being played on by the chimes every three hours. Opposite to the church gates is the old hall, taken notice of one hundred and fifty years ago by drunken **Barnaby** in his **Itinerary**—It is still an inn, and no doubt keeps up its ancient character.

*Venit Lonsdale, ubi cernam*  
*Aulam fasiam in tabernam;*  
*Nitida porta, nivosi maris,*  
*Cyntha plani, pance curas;*  
*Edunt, bibunt, ludunt, ridunt,*  
*Curd dignum, nihil vident.*

I came to **Lonsdale**, where I staid  
At **Hall**, into a tavern made;  
Neat gates, white walls, nought was sparing;  
Pots brimful, no thought of caring;  
They eat, drink, laugh, are still mirth making;  
Nought they see that's worth care taking.

**We**
We walked through the church yard, which is large and spacious, along the margin of an high and steep bank, to a neat white mansion house full in view, somewhat above half a mile distant, called Underlay.—I was never so amus'd with any prospect of the kind I had yet seen. At the foot of the steep bank on which we walked, being about forty or fifty yards perpendicular, glided the large, pellucid river Lune, amongst the rocks and pebbles, which amus'd the ear, whilst the eye was entertaining itself with a vast variety of agreeable objects. A transparent sheet of still water about half a mile in length lay stretched out before us: At the high end of it was a grotesque range of impending rocks of red stone, about thirty yards in perpendicular height, which had an excellent effect in the scene, both by their colour and situation. We were told that in winter this precipice was in some parts so glazed over with ice, from the trickling water down the surface, as to make it appear like a sheet of alabaster. From other parts of the impending rocks, hung great and enormous ivies, which made it appear like an huge organ.

After the eye had traversed over a rich and fertile vale, variegated with woods and country houses, the prospect was terminated with a chain of lofty mountains, which run in a direction from south to north, parallel to the course of the river. The nearest were not above two or three miles off, and looked like the bold and surly sentries of a legion, that seemed stationed beyond them. On our return, we were amus'd with prospects of a different nature. The church and town before us enlivened the scene: Some mill-wheels between them and the river, added
THE CAVES.

an agreeable variety with their motion. The vale beneath seemed to dilate and expand itself; the few parts of it, which were visible, afforded sufficient ground to the imagination to conceive an assemblage of the most entertaining objects. Ingleborough, whose head was wrapped in a cloud, stood the farthest to the south in the rank of mountains which faced us.

After breakfast, we walked by the side of the river to the bridge. The channel is deep, the stream rapid among rocks, the banks on each side covered with trees of various foliage, which serve both as a defence and ornament. The bridge is the most lofty, strong, ancient, and striking to the eye of a stranger, of any I have yet seen. It is built with freestone, has three arches, two large and one smaller; the height from the surface of the water to the center arch, is about twelve yards. The arches are of the ribbed sort, which make the appearance the more grotesque. There is no memorial of its foundation; a negative argument of its vast antiquity. We were indeed amused with one anecdote of its founder, which seemed to be a remnant of the ancient mythology of the north, and one instance, among many, of easily accounting for any thing that is marvellous. The country people have a tradition, that it was built by the devil one night in windy weather; he had but one apron full of stones for the purpose, and unfortunately his apron-string breaking as he flew with them over Catterton-fell, he lost many of them out, or the bridge would have been much higher.

From the top of the bridge the prospect down the river is delightful; the sides of the deep channel covered with trees, are nearly parallel.
for half a mile, and the water one continued surface, save here and there where a pointed rock lifts up its head above the stream. We walked down by the side of the river about a mile, and as we proceeded were continually presented with new prospects, while the soft murmurs of the river afforded a variety of different notes. The vale of Lonsdale dilating by degrees, presented us in succession with the different seats and villages that adorn it: Whittington, and Arkholm, to the west; Tunsial, Melling, Hornby and its castle, to the south; and Leck to the east; till we arrived at Orberough, the seat of Thomas Fenwick Esq., the most elegant in the vale. The brown and blue mountains of Burnmore, and Lyth-fell, terminated the view, which we could have wished had extended still farther to the south.

Our ideas of the beauties of nature were mellowed and refined by those of venerable antiquity. We were now on classic ground; Orberough being most undoubtedly a Roman station and garrison, the Bremetonaec of the emperor Antoninus, as may be collected from Tacitus, and other ancient writers. Bremetonaec is placed twenty Roman, or eighteen English miles north of Coccium, or Ribchester; and twenty seven Roman, or twenty four English miles south of Galacum, which some antiquaries conceive to be Apulby, though others with more probability think it was Brough. The distances correspond, besides the additional argument of their being nearly in the same direction, whether we conceive Galacum to be Apulby or Brough. The Roman road is easily traced from Ribchester into Yorkshire, running on the north side of Slaidburn, through
through Crofia-Greta, then on the north side of Tatham Chapel, through Bentham, to Overborough. * Afterwards the Roman road goes through Caister, and Middleton, and as some think, by Borough-bridge, and Orton to Apulby. Others, and perhaps from better reasons, are of opinion, the road went by Sedbergh or Sedburg, † over Blewcastor, along Ravenstonedale-street, and through Kirkby-Stephen, to Brough, or Burgh. For Antoninus's tenth Itinerary runs from Glenoventa or Lanchester, in the county of Durham, by Galacum, Bremetonacæ, Cocium, Mancunium or Manchester, to Glenoventa or Drayton, in the county of Salop. In various places by the side of this road are high artificial mounts of earth, which were without doubt the stations of sentinels, to prevent any insurrections, or being surprized by an enemy: They may be now seen entire at Burton in Lonsdale, Overborough, Kirkby-Lonsdale, and Sedbergh. There are several lateral ones, as at Lunes-bridge near Hornby, at Mellings, and Wennington. On our return we had the bridge full in view most of the way: Its antiquity and greatness made its presence venerable and respected. About a furlong before we arrived at the bridge, the town of Kirkby-Lonsdale appeared in a point of view peculiarly pleasing. The high walls of a gentleman's garden, which were between us and the town, made it look like

* A full account of the antiquities of Bremetonacæ or Overborough, may be seen in a quarto volume published by one Richard Rushbell.
† Caister or Caister, is derived from the Latin word castrum, or camp. Street is derived from the Latin word stratum, or military road, or causeway. Borough or Burgh, from the Greek word purge, or watch tower.
like a fenced city in miniature; the tower steeple of the church rising proudly eminent above the blue flated houles, with which it was on every side surrounded.

* We mounted our horses at the bridge about eleven o’clock, having ordered them down thither in order to save half an hour in going up to the town for them. We travelled near the bottoms of the mountains, on the side of Lonsdale, along the turnpike road, about an hour, being in three counties in that short interval, Westmorland, Lancaster, and Yorkshire, and amidst a variety of entertaining prospects. The number of small carts laden with coals, and each dragged by one sorry horse, that we met, was astonishing. Many of the smaller farmers betwixt Kirkby-Lonsdale and Kendal, earn their bread with carrying coals, during most part of the year, from the pits at Ingleton, Black-Burton, or Burton in Lonsdale, to Kendal, and the neighbouring places, for fewel, and burning lime in order to manure their land. These beds of coal, we were informed, are six or seven feet in thickness. A fire-engine was erecting at Black-Burton, more commodiously to work their blast collieries. A survey was lately subscribed for to be made, in order to have a canal from these pits to Lancaster, where coals might be exported; as also to Kendal and Settle, which are towns much in want of fewel.

After

* If the traveller is distressed for time, and has no inclination to take a second view of the river Lune and its environs, he may order his horse to be sent to Conman-bridge, and walk through the park of Borough-hall, where he may be entertained with a variety of other prospects.
After we had got about six miles from Kirkby-Lonsdale, to a public-house called Thornton-church-side, we stopped to procure a guide, candles, lanthorn, tinder-box, &c. for the purpose of seeing Tordas-cave, in the vale of Kingsdale, about four miles off. By the advice of a friend, we took also with us a basket of provisions, which we found afterwards were of real service. When we had gone a little above a mile, we were entertained with a fine cascade, called Thornton-force, near some slate quarries, made by this river out of Kingsdale, falling down a precipice about eight or ten yards high, which afterwards runs through a deep grotesque glen to Ingleton. About a mile higher we came to the head of the river, which issues from one fountain called Kelshead, to all appearance, more fluent than St. Winifred’s-well, in Flintshire; though there is a broken, serpentine, irregular channel, extending to the top of the vale, down which a large stream is poured from the mountains in rainy weather. We now found ourselves in the midst of a small valley about two or three miles long, and somewhat more than half a mile broad; the most extraordinary of any I had yet seen: It was surrounded on all sides by high mountains, some of them the loftiest of any in England,—Whernside to the south-east, and Gragareth to the north. There was no descent from this vale, except the deep

If proper provision is already made, it will be more convenient to leave the turnpike road a mile before the traveller comes to Thornton-church-side, viz. at the five mile-stone up a lane to the left, opposite a blacksmith’s shop, near some houses called Weston.
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chasm where we saw the cascade; we were quite secluded from the world, not an habitation for man in view, but a lonely shepherd's house, with a little wood, and a few enclosures near it, called Breada-garths: It is on the north side of an high mountain, seldom visited by man, and never by the sun for near half a year. No monk or anchoret could desire a more retired situation for his cell; or disappointed lover to moralize on the inconstancy of his nymph, and the vanity of the world. The soil seemed the deepest and richest in some parts of this vale of any I had ever observed, and no doubt is capable of great improvement. I could not but lament that instead of peopling the wilds and deserts of North America, we had not peopled the fertile vales of the north of England. I have since indeed been informed that a plan is in agitation for having it inclosed, when I make no doubt but it will support some scores of additional families. While I was musing on the many bad effects of peopling distant countries and neglecting our own, we arrived at the object of this excursion, Tordus-cave: It is almost at the top of the vale, on the north side of it, under the high mountain Gragareth. Having never been in a cave before, a thousand ideas, which had been for many years dormant, were excited in my imagination on my entrance into this gloomy cavern. Several passages out of Ovid's Metamorphosis, Virgil, and other classics crowded into my mind together. At one time I thought it like the den where Cadmus met the huge serpent.

Silva vetus habat, nullâ violata securî;
Efflusus in medio virgîs ac vîmina densîs;
THE CAVES.

Efficiens humilis lapidum compagibus arcur;
Uberribus succundus aquis. Hoc conditus ante

Within this vale there rose a shady wood
Of aged trees; in its dark bosom flood
A bushy thicket, pathless and unsworn,
O'errun with brambles, and perplex'd with thorn;
Amidst the brake a hollow den was found,
With rocks and shelving arches vaulted round,
Deep in the dreary den, conceal'd from day,
Sacred to Mars a mighty dragon lay. Addison.

Indeed there wanted nothing but an ancient
wood, to make one believe that Ovid had taken
from hence his lively description.

As we advanced within it, and the gloom and
horror increased, the den of Cacus and the cave
of Poliphemus came into my mind. I wanted
nothing but a Sybil conductress with a golden
rod, to imagine myself like Aeneas going into the
infernal regions. The roof was so high, and
the bottom and sides so dark, that with all the
light we could procure from our candles and
torches, we were not able to see the dimensions
of this cavern. The light we had seemed only
darkness visible, and would serve a timid stran-
ger, alone and ignorant of his situation,

To conceive things monstrous, and wondrous,
Than fables; yet have feigned, or fear conceived,
Gorgons and Hydras and chimeras dire. Milton.

C 2 Having

* See Virgil's Æneid, L. 3. 1. 616. and L. 6. 1. 205. and
L. 6. 1. 234.
Having passed a small brook which one of the party called the Stygian lake, we came to the western side of the cave. It is a solid perpendicular rock of black marble, embellished with many rude sketches, and names of persons now long forgotten, the dates of some being above two hundred years old. After we had proceeded twenty or thirty yards northward, the road divided itself into two parts, but not like that of Æneas when descending into the realms of Pluto;

Hic iter Elisionis nebibus, ab hora malorum
Exiret panae, et ad impia Tartara mittit.
Virgil Æneid, L. 6. l. 542.

'Tis here in different paths the way divides;
The right to Pluto's golden palace guides;
The left to that unhappy region tends;
Which to the depth of Tartarus descends;
The seat of night profound, and punish'd bends.

No, they both had a divine tendency: On the right was the bishop's throne, and on the left the chapter-house, so called from their resemblance to these appendages of a cathedral. Here we could not but lament the devastation made in the ornaments of these sacred places; some Goths not long since, having defaced both throne and chapter-house of their pendent petrified works, which had been some ages in forming. The little cascades which fell in various places from the roof and sides, with different trilling notes, served to entertain the ear with their watery music; while the eye was busy in amusing itself with the curious reflections which were
were made by our lights from the streams and petrifications which appeared all around us. We were told by our guide, what a great effect the discharge of a gun or pistol would have upon our ears: But not being desirous to carry our experimental philosophy so far as to endanger or give pain to the organs of hearing, we were not disappointed in having no apparatus for the purpose. We were shewn a low and narrow passage on one of the shelves of the rock near the chapter-house, which we were informed led to a wider path, extending itself into the heart of the mountain; but our curiosity was satisfied without crawling among the rocks besmeared with slime and mud. From the dome of this natural edifice fell a fine and fluent cascade, which served in a peculiar manner to embellish the works of nature, in a style superior to any thing we can have in those of art.

While we were regaling ourselves with the provisions we had brought, we inquired of our guide, if he could furnish us with any curious anecdotes relative to this cave. After informing us that it had been alternately the habitation of giants and fairies, as the different mythology prevailed in the country; he mentioned two circumstances we paid some attention to. About fifty or sixty years ago, a madman escaped from his friends at or near Ingleton, and lived here a week, in the winter season, having had the precaution to take off a cheese and some other provisions to his subterranean hermitage. As there was snow on the ground, he had the cunning of Cacus, (see Virgil Aeneid, L. 8. l. 209) to pull the heels off his shoes, and set them on inverted at the toes, to prevent being traced: An ins
ftance, among many others, of a madman's rea-
soning justly on some detached part of an absurd
plan or hypothesis. Since that time, he told us
a poor woman big with child, travelling alone
up this inhospitable vale to that of Dent, was
taken in labour, and found dead in this cave.

Leaving Fordas, we shaped our course across
the vale by Twisleton, to Ingleton. The rocks
on each side of Kingsdale are black marble, of
which, elegant monuments, chimneys, slabs, and
other pieces of furniture are made by a Mr.
Tomlinson, at Burton in Lonsdale; when polished,
this marble appears to be made up of entrochi,
and various parts of tesselaceous and piscolous
reliquies. In our return down this vale we saw
a large heap of small stones, called an hurder:
They had undoubtedly been collected by human
hands, and were thrown, most probably, as a
tumulus, over some dead person of consequence.
It may appear strange that any one of distinc-
tion should be buried in so solitary a place:
We saw however three or four more of these
hurders in our way from Ingleton-fells to Horton,
on the bleak and barren moors by the way side.
After we had regaled and rested ourselves com-
fortably at Ingleton, we took an evening walk a-
bout a mile above the town, to the slate quarries,
by the side of the river Wea, or Greta, which
comes down out of Chapel in the dale, and joins
the Kingsdale river at Ingleton. Here we had
objects both of art and nature to amuse ourselves
with: On one hand was a precipice ten or twelve
yards perpendicular, made by the labour of
man, being a delve of fine large blue slate, aff-
ording an useful and ornamental cover for the
houses
houses in the adjoining parts of Yorkshire, Lancashire, and Westmorland: On the other hand was the river rolling down from rock to rock in a narrow deep chasm, where there was no room for human foot to tread between the stream and the rugged, high, steep rocks on each side. Several pieces of the slate were bespangled with yellow marcasites of a cubic form, and different sizes, others were gilded over with the various foliages of ferns, pines, oaks, and other vegetables. We crossed the river by means of the broken fragments of rocks, which afforded us their rugged backs above the surface of the water to tread on. Here we met with a fine field for our entertainment as botanists. There was the lady's slipper, the fly orchis, rarely to be met with elsewhere, and many other scarce and curious plants. We crossed over to take a second view of Thornton-force, on the south side of the Kingsdale river, and followed its murmuring stream down a deep glen, fortified with high precipices on each side, to Ingleton. Nor did we think ourselves ill repaid for all the difficulties we had to encounter in our road amongst rocks and streams, as something new and amusing presented itself almost every step we took.

Ingleton is a pretty village, pleasantly situated on a natural mount, yet at the bottom of a vale, near the conflux of two rivers, over which are thrown two handsome arches. When the celebrated Mr. Gray was here, he observed that great stones were rolled along their beds instead of water: But if the streams are sometimes small in a drought, they are remarkably fluent and impetuous
impetuous in a flood. * The church-yard, in
the middle of which stands a neat sacred edifice,
commands a fine view of the vale of Lonsdale,
almost as far as Lancaster. The murmurs of
the streams below soothe the ear, while the eye
is selecting a variety of objects for its entertain-
ment. On the back-ground are the lofty moun-
tains of Gragareth, Whernside, and Ingleborough,
the summits of which, when they are not en-
veloped in the clouds, can scarcely be seen for
their high intervening bases. When the top of
Ingleborough is covered with a thick white mist,
or, as the country people say, when he puts on
his night-cap, there are often strong gusts, called
helm winds, blowing from thence to that part
of the country which adjoins to its base. The
like observation is made by mariners of the table
land at the Cape of Good Hope, on the coast of
Africa. They are called helm winds from their
blowing from the cloud or helmet that covers
the head of the mountain. Amongst other en-
tertainments, the civil usage and good accom-
modations we met with at our inn, the Bay-
horfe, contributed not a little to heighten the
amusements and pleasures of the day.

Early next morning we set off for Ingleton-
fells, or Chapel in the dale, along the turnpike
road leading to Askrigg and Richmond. We had
not

* The editor of Barnaby’s Journal has this dithyramb on
Ingleton.

Pirgus inept farn, funum sub aerumine collis;
Collis ab elatis actu & ausus aquis.

The poor man’s box is in the temple set;
Church under hill, the hill by waters beat;
not travelled much above a mile before we came into the dale, which is about three quarters of a mile broad. For near three miles it had something in its appearance very striking to the naturalist: There were high precipices of limestone rock on each side; and the intermediate vales to a lively imagination would seem once to have been of the same height, but sunk down by the breaking of pillars, which had supported the roof of an enormous vault. About three miles from Ingleton is the head of the river Wease, or Greta, on the left hand side of the road, only a few yards distant from it. It gushes out of several fountains at once, all within twenty or thirty yards of each other; having run about two miles underground, though making its appearance in two or three places within that distance. When there are floods, it runs also above ground, though not in all places, except the rains are extraordinary great. This is the subterranean river mentioned by Dr. Goldsmith in his entertaining Natural History, Vol 1.

When we had gone about a mile farther, being four miles from Ingleton, we turned off the turnpike road to some houses near the chapel, where we left our horses. At first we imagined we had here met with an exception to the maxim of poet Butler, the author of Hudibras, viz.

A Jesuit never took in hand
To plant a church in barren land.

For the chapelry produceth neither wheat, oats, barley, peas, or any other sorts of grain; nor apples, pears, plumbs, cherries, or any kind of fruit: A ripe goose-berry was a natural-curiosity in
in the summer season, in most parts of the
district; even their potatoes they have from
other places. Yet though they were destitute of
these productions, they were blessed with others
as valuable by way of compensation. They
abounded with excellent hay grounds and pas-
tures, and were rich in large flocks and herds
of cattle, which enabled them to purchase
every convenience of life. Having little inter-
course with the luxurious, vicious, and design-
ing part of mankind, they were temperate, sub-
stantial, sincere, and hospitable. We found an
intelligent, agreeable, and entertaining compa-
nion and guide in the curate, who served them
also as school-master: As Dr. Goldsmith observes
on a like occasion;

A man he is to all the country dear,
And passing rich with thirty pounds a year.

The first curiosity we were conducted to was
Hurtlepot, about eighty yards above the chapel.
It is a round deep hole, between thirty and forty
yards diameter, surrounded with rocks almost
on all sides, between thirty and forty feet perpen-
dicular above a deep black water, in a subter-
anean cavity at its bottom. All round the top
of this horrid place are trees, which grow secure
from the axe; their branches almost meet in the
center, and spread a gloom over a chasin dread-
ful enough of itself without being heightened
with any additional appendages: It was indeed
one of the most dismal prospects I had yet been
presents with. The descent of Æneas into the
infernal regions came again fresh into my ima-
gination,
gination, and the following passage out of Virgil obtruded itself on my memory.

Speluncia alta sit, vastique immanus hiatus;
Serpens, tua lanu nigro memorique tenetris;
Quam super hiem alta poenient impune volantes
Tendere iter permis: tali sejus balitus atri
Faucibus effundens super ad convivum ferrebat;
Unde locus Graii dixerunt nomins Avernum.


Deep was the cave; and downwards as it went
From the wide mouth, a rocky, rough descent;
And there the access a gloomy grove defends;
And there the un navigable lake extends;
O'er whole unhappy waters, void of light,
No bird presume to steer his airy flight:
From hence the Grecian bards their legends make,
And give the name Avernum to the lake.

Dryden.

After viewing for some time with horror and astonishment its dreadful aspect from the top, we were emboldened to descend by a steep and slippery passage to the margin of this Avernian lake. What its depth is we could not learn; but from the length of time the sinking stones we threw in continued to send up bubbles from the black abyss, we concluded it to be very profound. How far it extended under the huge pendent rocks we could get no information, a subterranean embarkation having never yet been fitted out for discoveries. In great floods we were told this pot runs over; some traces of it then remained on the grafs. While we stood at the bottom, the awful silence was broken four or five.
five times in a minute, by drops of water falling into the lake from the rocks above, in different solemn keys. The sun shining on the surface of the water, illuminated the bottom of the superincumbent rocks, only a few feet above; which, being viewed by reflection in the lake, caused a curious deception, scarce anywhere to be met with: They appeared at the like distance below its surface in form of a rugged bottom. But alas! how fatal would be the consequence, if any adventurer should attempt to wade across the abyss on this fallacious principle. This deep is not without its inhabitants; large black trouts are frequently caught in the night by the neighbouring people.

On our return we found the poet Virgil’s maxim too true.

--- Facilis descensus Averni:
Nocte atque die pater atri jama Ditis;
Sed revocare gradum, superaque ruader ad auras,
Hoc opus, hoc labor est.

Aeneid, B. 6. l. 126.

The gates of hell are open night and day;
Smooth the descent, and easy is the way;
But to return and view the cheerful skies;
In this the task and mighty labour lies.

Dryden.

When we arrived in the superior regions, we pursued our journey about a hundred and fifty yards farther up a very narrow grotesque glen, over a natural bridge of limestone above ten yards thick, having the subterranean river Wease, or Greta underneath. When we got to the head
head of this gill, we were stop'd by a deep chasm called Ginglepot, at the bottom of a precipice: It is of an oblong and narrow form; an enterprising person with a steady head and active heels, regardless of the fatal consequences from a false step, might leap over it. It is filled with smooth pebbles at the bottom, except at the south corner, where there is deep water, which in floods swells up to the top, and issues out in a vast torrent. The length of this chasm is about ten yards, and the perpendicular depth, at the north corner, about twenty yards. In our way from Hurtlepot, we could not help remarking the ruins of two small artificial mounts of earth, which we were told formerly served as butts, when the inhabitants exercised themselves in the ancient military accomplishment of archery.

Returning back a little way from Ginglepot in order to find a passage out of this dreary glen, we proceeded about a hundred and twenty yards higher when we came to Weathercoat-cave or cove* the most surprising natural curiosity of the kind in the island of Great Britain. It is a stupendous subterranean cataract in a huge cave, the top of which is on the same level with the adjoining lands. On our approach to its brink, our ears and eyes were equally astonished with the sublime and terrible. The margin was surrounded with trees and shrubs, the foliage of which was of various shapes and colours, which had an excellent effect, both in guarding and ornamenting the steep and rugged precipices on every

* The word cave is pronounced by the country people cove, or cower. This hint may be of service to a stranger in his enquiries.
every side. Where the eye could penetrate through the leaves and branches, there was room for the imagination to conceive this cavern more dreadful and horrible, if possible, than it was in reality. This cave is of a lozenge form, and divided into two by a rugged and grotesque arch of limestone rock: The whole length from south to north is about sixty yards, and the breadth about half its length. At the south end is the entrance down into the little cave; on the right of which is a subterranean passage under the rocks, and a petrifying well: A stranger cannot but take notice of a natural seat and table in a corner of this grotesque room, well suited for a poet or philosopher: Here he may be secluded from the bustle of the world, though not from noise; the uniform roaring however of the cascade will exclude from the ear every other sound, and his retirement will conceal him from every object that might divert the eye. Having descended with caution from rock to rock, we passed under the arch and came into the great cave, where we stood some time in silent astonishment to view this amazing cascade. The perpendicular height of the north corner of this cave, was found by an exact admeasurement to be thirty six yards; near eleven yards from the top issues a torrent of water out of an hole in the rock, about the dimensions of the large door in a church, sufficient to turn several mills, with a curvature which shews, that it has had a steep descent before it appears in open day; and falls twenty five yards at a single stroke on the rocks at the bottom, with a noise that amazes the most intrepid ear. The water sinks as it falls among
the rocks and pebbles at the bottom, running by a subterraneann passage about a mile, where it appears again by the side of the turnpike road, visiting in its way the other caverns of Ginglepot and Hurlepot. The cave is filled with the spray that arises from the water dashg against the bottom, and the sun happening to shine very bright, we had a small vivid rainbow within a few yards of us, for colour, size, and situation, perhaps no where else to be equalled. An huge rock that had sometime been rolled down by the impetuosity of the stream, and was suspended between us and the top of the cascade, like the coffin of Mahomet at Medina, had an excellent effect in the scene. Though the stream had polished the surfaces of the pebbles on which it fell at the bottom by rolling them against each other; yet its whole force was not able to drive from its native place the long black moss that firmly adhered to the large immovable rocks. We were tempted to descend into a dark chamber at the very bottom of the cave, covered over with a ceiling of rock above thirty yards thick, and from thence behind the cascade, at the expense of having our cloaths a little wet and dirtied, when the noise became tremendous, and the idea for personal safety awful and alarming. We were informed that in a great drought the divergency of the stream is so small, that we might with safety go quite round the cascade. At the bottom we were shewn a crevice where we might descend to the subterranean channel, which would lead us to Ginglepot, and perhaps much further; we were also shewn above, a shallow passage between the strata of rocks, along which we might crawl to the
the orifice out of which the cascade issued, where it was high enough to walk erect, and where we might have the honour of making the first expedition for discoveries; no creature having yet proceeded in that passage out of sight of daylight: But as we were apprehensive the pleasure would not be compensated by the dangers and difficulties to be encountered in our progress, we did not attempt to explore these new regions. After a little rain another cascade similar to the former falls nearly from the same height on the west side of the cave, appearing and disappearing with great variety amongst the rocks, as if it fell down the chimney of a ruinous building, where several holes were made into it in the gable-end. If the rains still increase, a large stream sets in out of the room by the side of the little cave; and in great floods a vast river falls into the great cave down the precipice on the eastern side. With their united streams they are sometimes able to fill the whole capacity of the cavern and make it overflow; the subterranean crannies and passages of this leaky vessel not being able with the encroached pressure from above, to carry off the water as fast as it is poured in; but this happens only once in seven or ten years.

Having satisfied our curiosity in viewing this wonder of nature, and moralized on the insignificance of all human attempts in producing any thing like it, we ascended into our native regions and proceeded to another called Douk Cove, about a mile south, on the other side of the turnpike road, towards the foot of Ingleborough, whose height now appeared to great advantage from the nature of our own elevated situation.
Dunk-cove is something similar to that of Weathercoate, but not heightened so much with the vast and terrible: The cavity indeed is longer and wider, but not deeper; the rocks not so high and steep, except on the east side, where the hawks and other birds build their nests, not dreading the approach of human foot. The stream of this cascade does not fall above five or six yards, and is not so large and fluent as the former; though like it, is immediately absorbed amongst the rocks beneath. The subterranean passage out of which it issued is very curious. By the help of a ladder we ascended and went along it to some distance by means of candles: When we had gone about forty or fifty yards, we came to a chasm ten or twelve yards in depth from the surface, through which we could see broad day. How far we could have proceeded, we know not; we returned, after we had been about a hundred yards. This would be looked on as a great curiosity in many countries; but after those we had seen, our wonder was not easily excited.

We were now on the base or pediment on which Ingleborough * stands, and greatly elevated above all the western country. Our distance from the bottom, where the steep ascent of this high mountain begins, was about a mile in a direct horizontal line over rocks and pits. The

* The word Ingleborough seems to be derived from the Saxon word Ingeldre, which signifies a lighted fire, and borough, or burgh, which comes originally from the Greek word στήριγμα, and signifies a watch tower; the labial s and b being often changed into each other: For here a beacon is erected, on which a fire used to be made as a signal of alarm in times of rebellions or invasions.
A TOUR TO

fineness and clearness however of the day induc
ced us to ascend its sides and gain its summit: Though we had many a weary and slippery step, we thought ourselves amply repaid when we got to the top, with the amusement we received in viewing the several extensive and diversified prospects, and in making our observations as botanists and natural historians, on its productions and contents. All the country betwixt us and the sea, to the extent of forty, fifty, and sixty miles from the north-west, by the west to the south-west, lay stretched out beneath us, like a large map, with the roads, rivers, villages, towns, seats, hills and vales, capes and bays, in succession. Elevation is a great leveler; all the hills and little mountains in the country before us, appeared sunk in our eyes, and in the same plane with the adjacent meadows. To the north-west, the prospect was terminated at the distance of forty or fifty miles, by a chain of rugged mountains in Westmorland, Lancashire, and Cumberland, which appeared as barriers against the fury of the ocean. To the west the Irish sea extends as far as the eye can penetrate, except where the uniformity of the watery prospect is interrupted by the Isles of Man and Anglesey. The blue mountains in Wales terminated our further progress, after we had traced out the winding of the coast all the way from Lancaster, by Preston, and Liverpool. A curious deception presented itself: All the vales between us and the sea appeared lower than its surface; owing to the sky and earth both apparently tending to a line drawn from the eye parallel to the horizon, where they at last appeared to meet. To the east and north, the prospect
prospect was soon terminated by a number of black, irregular, chaotic mountains, which by their indentations and winding summits, gave us reason to conclude they contained habitable vales between them. Their sides afford an hardy and wholesome pasture for sheep, and their bowels contain rich mines of lead, some of which are wrought with great advantage to the proprietors.

The immense base on which Ingleborough stands, is between twenty and thirty miles in circumference: The rife is in some places even and gradual, in others, as to the north and west, it is rugged and almost perpendicular. The top is plain and horizontal, being almost a mile round, having the ruins of an old wall about it, from which some ingenious antiquaries endeavour to prove that it has once been a Roman station, and place of great defence. Of late years it has never been frequented by any except shepherds, and the curious in prospects, and the neighbouring country people, who resorted to the horse races, which were formerly annually held on its top. On the western edge there are the remains of what the country people call the beacon, some three or four yards high, ascended by a flight of steps. The ruins of a little watch-house is also adjoining: No doubt in time of wars, insurrections, and tumults, and particularly during the incursions of the Scots, a fire was made on this beacon to give the alarm to the country round about. The soil on the top is so dry and barren that it affords little grass, the rock being barely covered with earth: A spongy moss is all the vegetable that thrives in this lofty region. The stones on
the summit, and for a great way down, are of
the sandy gritty soil, with freestone slate amongst
them. Upon the base, the rocks are all limestone
to an enormous depth. Near the top indeed,
on the east side, is a stratum of limestone like the
Derbyshire marble full of entrochi. Several springs
have their origin near the summit, particularly
one on the north side, of pure and well-tasted
water, called Fair-weather-syke, which runs down
by the side of a sheep fence wall into a chain
called Meir-gill. All the other springs, as well
as this, when they come to the limestone base
are swallowed up, and, after running perhaps a
mile underground, make their appearance once
again in the surrounding vales, and then wind
in various courses to the Lune or Ribble, which
empty themselves into the Irish sea.

The other stones and fossils on and about
Ingleborough, are black and brown marbles,
abounding with white sea shells, sparks of spar,
and flakes of entrochi; spars of various sorts,
the stalactical and icicle in the caves, flates pale
and brown, and near Ingleton blue; black fliver,
triploi or rotten-stone, bloodstone and lead ore.
The foil on the base and sides of Ingleborough
(where there is any) is chiefly peat moss, which
the country people get up and burn for fuel.
The cover is in general ling or heath. Other
vegetables are, ferns of various kinds; reindeer-
moss, and various other mosses, helborines
white and red; the different sorts of seedums;
cranes hills, scurvy-grass, bird's eyes, various
liver-worts, orchises, rose-wort, lilly of the val-
ley, mountain columnines; the hurtle-berry or
bill-berry, knout-berry, cran-berry, whartle-
berry, cloud-berry, and cow-berry, Shinha,
birds,
Bird-cherry, mountain-ash, gelder-rose, burnet-rose, stone-ramble, red and black currants. In the Foot-foot, which is in the north-west corner of this mountain, is found the viviparous-grass, and the rose-of-the-root, which has a yellow flower, and is like house-leek. Near Ingleton, as was before observed, is the lady’s slipper, and fly orchis. The chief animals found on and about Ingleborough are, grouse, the ringoule, and wheat-eater; the fox, mountain-cat, wild-cat, pole-cat, weasle, stoat, badger, and martin.

The perpendicular height of this mountain above the level of the sea is 3987 feet, as taken by a country gentleman, though it is marked 1760 yards, or exactly one mile high, in the new map of Yorkshire. It is agreed on all hands, and is obvious enough to the eye, that Whernside, which is on the north side of the vale of Chapel in the dale, is the higher, though not so well situated for extensive prospects. If this mountain is one mile high, it may be calculated from the principles of mathematics, that the prospect along the sea will extend above ninety miles from the eye. The top of Ingleborough is the first land however that sailors delight in their voyage from Dublin to Lancaster, though above thirty miles from the sea, which shews the great elevation of this mountain.

In our return we visited the long, deep, and dreadful chasm of Meir-gill, on the west side of the sheep-fence wall, running north and south over the base of Ingleborough: It is about eighty yards long, but in most places so narrow that a person may stride over it, and is nowhere above two or three yards wide; in one place there is a curious
a curious natural bridge over it. The depth is very different, in different places; at one place we found it a hundred feet, forty eight of which was in the water. One part will admit a bold and active adventurer down almost to the water by a gradual, but slippery descent: Here the shadow of the superincumbent rocks, like that in Hurtlepot, forms a very deceitful appearance in the water: The bottom seems not above two feet below the surface; but how fatal would be the attempt to wade this abyss in quest of further discoveries, from this shadow of encouragement? The narrowness of this crevice at the top has something dreadful and alarming in it: How fatal would one false step prove to the unwary shepherd amongst the snow, when the mouth is drifted up; or to a stranger bewildered in the fog, and looking forwards with eager eyes for some habitation, or frequented path? Harmless and heedless sheep have often been suddenly swallowed up by this gaping wonder of nature. To say that no living creature ever came out of its womb, would be a proposition too general. Trouts of a pro- tuberant size have been drawn out of it, where they had long been nourished in safety, their habitation being seldom disturbed by the insidious fisherman.

A little further to the east we came to another curiosity of nature, called Barfoot-wive's-hole: We had noticed it in our ascent up the side of Ingleborough. It is a large round pit in form of a funnel, the diameter at top being about fifty or sixty yards, and its depth twenty six. It is easily descended in most places, though on the south side there is an high rocky precipice, but
The Caves.

That is dry, the waters that are emptied into it, being swallowed up among the rocks and loose stones at the bottom. In our way back we also saw Hardrawgill, and some other subterranean passages of less note, which had been formed by the waters in their descent from the mountain adjoining to Ingleborough to the vale beneath. Indeed the whole limestone base of this monster of nature is perforated and excavated in all directions like a honeycomb.

From the Chapel in the dale, we shaped our course towards the south-east corner of Whernside, along the road leading to the village of Dent. As we proceeded, the curate entertained us with an account of some singular properties observable in the black earth, which composes the soil in the higher parts of the vale, in various morally places. It is a kind of ignem lutum, or rather a sort of putrified earth, which in the night resembles fire, when it is agitated by being trod upon: The effects it produces in a dark evening are truly curious and amazing. Strangers are always surprized, and often frightened, to see their own and horses' legs be-sprinkled with all appearance with fire, and sparks of it flying in every direction, as if struck out of the ground from under their feet. They are as much alarmed with it, as the country people are with the Will with the wife, or mariners with the luminous vapour of the dëlapsed Castor and Pollux. Though the dark and dreary moor is broke into thousands of luminous particles, like to many glow-worms, when troubled by the be-nighted traveller, yet if any part of this natural phosphorus is brought before a lighted candle, its splendour immediately vanishes, and it shrinks back.
back into its original dull and dark state of fordid dirt. While we were endeavouring to account for this curious phenomenon on the principles of putrefaction and electricity, we arrived at the first object of this lateral excursion from the turnpike road, *Gate-kirk-cave:* The brook which runs through it forms a fine natural basin of transparent water at its egress, where we entered the cave, gradually encreasing in depth till about five or six feet at moli: I believe every one present thought it resembled the cave described by Ovid in the second book of his *Metamorphoses,* where *Actaeon* unfortunately met with *Diana* and her nymphs amusing themselves with bathing, when separated from his companions during the chase.

*Vallis erat pictis, et acidi densa cupressa,*
*Nomine Gargantia: succinthus laca Diana:*
*Cujus in extremo est antrema nemorale recessus,*
*Arte laboratum nullam: simulauerat artem*
*Ingenius natura: haec nam pumice vulva,*
*Et laeus eophis antimum duxerat arcum:*
*Fons sinat in estra, tenus pellucidus unius,*
*Marginis granatum patulas succidius bisius.*
*His Dea suavum venat, fessa sollebat*
*Virgines aris liquido perpendere rose.*

Ovid, B. 3, Fab. 7.

Down in a vale, with pine and cypress clad,
Refresh'd with gentle winds, and brown with shade,

The

* A furlong or two before we arrived at *Gate-kirk,* we passed a little cascade among some hollow limestone rocks, which would be a fine embellishment to a gentleman's garden or park.
The caves Diana's private haunt there stood;
Fall in the center of a darksome wood,
A spacious grotto, all around o'ergrown
With hoary moke, and arch'd with pumice-stone.
From out its rocky cliffs the waters flow,
And trickling swell into a lake below:
Nature had every where to play'd her part,
That every where she seem'd to vie with art.
Here the bright goddess, toil'd and chaf'd with heat,
Was wont to bathe her in the cool retreat.

Over the cave, where the water flows, is another subterranean passage, of about twenty four feet in length, and from three to ten in height: It enters the other obliquely, and looks like a natural orchestra, and where indeed a band of music would exhibit to great advantage to an audience below. The roof is at least six yards high at the first entrance: When we had proceeded out of sight of day, a new train of ideas were excited in our imaginations. We could not but fancy that it was like the cave of Polyphemus, or of some giant in modern romance, who hung up the mangled limbs of the unhappy victims that fell into his hands, to the dome of his murky den. From the roof were pendent large petrifications in every grotesque shape; some like hams, others like near's tongues, many like the heads and various parts of different animals. As we proceeded along we met with several bye streets or lanes, down some of which came tinkling little currents; but they seemed not to admit a passenger with ease to any great distance: As we went along we observed that the way divided for a considerable part.
part of the whole length into two main streets, which united again, made by the current dividing above into two streams. After we had gone about seventy yards we met with an orifice, which easily admitted us above ground. We had no curiosity to explore any farther, as the roof was now become only some four feet high, and not admitting us with ease beyond this aperture. The brook which runs through this cave is the main stream of the river Greta, which runs underground for at least two miles, making its appearance here, at Weather-coat, and a few other places in its way down to its open channel. The pools that are formed by the brook after its exit out of the cave, exhibit a pleasing and rural scene, being shaded with rocks, weeping willows, and the mountain ash.

Having travelled a mile or two farther, and passed through the little remote village of Wintercales, we came to the natural curiosity we were in quest of, Greenside-cave: It is under the south-east corner of the lofty mountain, Whernside: The mouth was wide and high, and the road rugged; but the roof gradually sunk, or the bottom arose, till it was troublesome getting along, soon after we were out of sight of day. A small brook ran along the bottom, as in the other caves, but there were none of the curious petrifications we saw in most of them to delight the eye. Churchill's description of the Caledonian cave of famine, with a few alterations, will convey a just idea of Greenside-cave.

This lonely cave (hard tax on Scottish pride!)
Shelter at once for man and beast supply'd.
THE CAVES.

Their shafts without, entangling briers spread,
And thistles arm'd against th' invader's head:
Here webs were spread of more than common size,
And half starv'd spiders prey'd on half starv'd flies;
In quest of food, efts strove in vain to crawl,
Slugs, pinch'd with hunger, smeared the slimy wall—
The cave around with falling rivulets rang,
And on the roof unhealthy vapours hung.

Near the mouth of this cave is a thin stratum
of coal, not many inches thick: Some attempts
had been made to work it, but affording so small
gains, and the inhabitants being so well sup-
plied with this article from Ingleton, it was soon
deserted. Being so near the top of Whernside,
we ventured to ascend to the summit. The
prospects were not diversified with many plea-
sing objects, being surrounded almost on all
sides with brown and blue chaotical mountains.
We had a peep into the pleasant vale of Dent
beneath us, which made us wish to see it all.
Pendle-bill appeared over the top of Ingleborough,
which gave us an high idea of our own eleva-
tion, this latter mountain being much higher
than the former. We were surprized to see
four or five tarns or pools of water, on a plain
very near the summit of Whernside. Two of
them were large, being two or three hundred
yards in length, and nearly of the same breadth;
for one was almost circular, but the other ob-
long. There was a very thin bed of coal almost
on the top of this mountain, and we were told,
another corresponded with it on the top of great
Calm, a lofty mountain on the other side of that
branch of the vale of Dent called Dibdale. We
were told some curious anecdotes of the vast

F.2 cunning
tunning and sagacity of the sheep dogs in this
country, in discovering the sheep that had been
buried under large drifts of snow for some days,
and that must inevitably have perished with
hunger, or been drowned with the melting of that
vapour, if not discovered by these useful animals.

We now shaped our course back to Winter-
scales, and from thence to a public-house called
Gearstones, by the side of the turnpike road, at
the bottom of the mountain Cam. Here we
refreshed ourselves and let our horses, while
we went about half a mile to the south, to
explore another subterranean wonder of na-
ture called Catknot-hole. The entrance into
it at first is not above three or four feet
high, but almost immediately increases to as
many yards. We had not gone out of sight of
day, before we were obliged to wade up to the
mid-leg a few yards, through a little pool made
by the rill, that comes out of this cave. The
passage grew narrower, but wide enough to
walk along with ease, except in one or two
places, where we were in danger of daubing
our cloaths with a red slime. We proceeded
above a quarter of a mile, when the road grew
wider, but the roof was so low, that we could
not go on with ease and pleasure: Perhaps if
we had mustered humility and fortitude enough,
to have crouched and crawled a little, we might
have come to where the roof again would have
been as high as we should have desired. In
some places there were alleys out of the main
street, but not extending to any great distance,
so as to admit of passengers. The rocks jutted
out, and were pendent in every grotesque and
costallish shape; most of them were covered
over.
Over with a fine coating of spar, that looked like alabaster, while icicles of various shapes and colours were pendent from the roofs, all generated by the fine particles of stone that exist in the water, which transudes through the roof and sides, and leaves them adhering to the rock in their descent to the bottom. The various coloured reflections made by the spar and petrifications that abounded in every part, entertained the eye with the greatest novelty and variety; while at the same time, the different notes made by the rill in its little cascades, and reverberated from the hollow rocks, amuse the ear with a new sort of rude and subterranean music, but well enough suited to our slow and gloomy march. This was the longest subterranean excursion we had yet made, and if we might have formed our own computation of its extent, from the time we were in going and coming, and not from the real advancement of our guide, we should have thought it two or three times as long as it was; so much were we deceived in our estimate of a road, unlike any we had ever before traveled. The romantic cascades, pools, and precipices in the channel of the river Ribble, that runs by the mouth of this cave, are not unworthy the notice of a stranger.

We were in some suspense whether we should pursue the turnpike road over Carn, to see the natural curiosities in Wenfleydale: But as we learnt there was only one remarkable object of the genus of those we were now in quest of, Hardraw-far, we denied; as we should have lost others more valuable, which lay in a different route. The description, however, which was
was given of it by our reverend guide, was so lively and picturesque, that its own merit will be a sufficient apology for its invention.

"Hardraw-fear is near the town of Hawes, in Wensleydale, and bears some distant affinity to the tremendous Gordal (hereafter taken notice of.) The chasm is pervious at the bottom, and extends above three hundred yards in length, fortified with huge shattered rocks on each side, which are in some places thirty three yards perpendicular, and the intervallum above eighty. At the far end is an amazing cataract, which pours forth a vast quantity of water; that falls into a deep basin. Behind the waterfall is a deep recess excavated out of the solid rock: Here the spectator may stand behind the stream secure from its medleying effects, and may go quite round it upon one of the numerous fossa sedilia, at the distance of ten yards from the water. In the year 1740, when fairs were held upon the Thames, this cascade was frozen and constituted a prodigious hide of a conic form, thirty two yards and three quarters in circumference which was also its height."

After having determined to go by Settle, we had our doubt, whether we should proceed by Ling-gill, which is a curious and romantic channel of a small river, having high and grotesque rocks on each side; or take a more western direction on the other side of the river Ribble, in order to see some other caves and chasms. Our taste for curiosities of this sort induced us to adopt the latter plan. We returned about a mile before we left the turnpike road, and then turning off to the left, proceeding almost to the same distance, we came to Alan or Alum-pot,
two or three furlongs above the little village of Selfide. It is a round steep hole in the lime-
stone rock, about eight or ten yards in diame-
ter, and of a tremendous depth, somewhat
resembling Eden-hole, in Derbyshire. We stood
for some time on its margin, which is fringed
round with shrubs, in silent astonishment, not
thinking it safe to venture near enough to its
brim, to try if we could see to its bottom. The
profundity seemed vast and horrible from the
continued hollow gurgling noise, excited by the
stones we tumbled into it. We plumped it to
the depth of a hundred and fifty five feet, forty
three of which were in water, and this in an ex-
traordinary dry season: As the direction of this
hole was not exactly perpendicular but somewhat
foping, it is very probable we were not quite at
the bottom. A subterranean rivulet descends into
this terrible hiatus, which caused such a dread-
ful gloom from the spray it raised up as to
make us shrink back with horror, when we
could get a peep into the vast abyss. We were
informed, that not long since some animals, an
ox and a calf at different times, had the misfor-
tune to tumble into this dreary pit, being
tempted by the untouched herbage to venture on
its slippery margin. Only a low mound of earth
surrounds its brim; for a stone wall would an-
swer no other purpose, than to afford the curious
traveller materials to throw in for his amuse-
ment. Any advantage arising from the skins
and carcasses of these animals, were not sufficient
inducements to tempt a neighbouring adventur-
ous youth to be let down by ropes to the bot-
tom of this frightful chasm. The waters run
from its bottom above a mile underground, and
then
then appear again in the open air, below the little village of Selfide. After having excited the several passions of curiosity, dread, and horror, from the negative knowledge we got of the capacity and depth of this huge pot, we went a little way higher up the mountain, and came to another hiatus called Long-churn. We descended down till we came to a subterranean break: We first ascended the cavern, down which the stream ran; proceeding in a western direction, for at least, as we imagined, a quarter of a mile, till we came to a crevice which admitted us into our native region. We measured the distance between the two extremities above ground, and found it two hundred and forty one yards; but it must be nearly double that distance along the passage below, on account of all the turnings and windings. The petrifications here were the most numerous of any we had yet seen, few people coming hither to break them off or deface them. When we were almost arrived at the western extremity, we came to a fine round basin of pellucid water, from three to twelve feet deep, known by the name of Dr. Bannister's hand basin. A lofty, spacious, and elegant dome is placed immediately over it, which nicely corresponds to the hollowed receptacle at the bottom: Into this basin a rivulet falls down a steep rock above six feet high, which is very dangerous to get up; and must be done at the expence of a wet skin, except a ladder is taken along with the party; or the waters are less fluent, than when we were there. There is also some danger left the adventurer should fall back, and have his bones broken by circumjacent rocks, or be drowned.
in the doctor's bason. After having surmounted this obblace, and proceeded some yards farther, we were favoured with an egress into our own element, as was before observed; no unwelcome change, after having been so long excluded from it. After having rested ourselves a little, we returned to the chalm, where we first entered Long-churn, and descending again, pursued the rivulet eastward along another extensive subterranean passage, called Dicken-pot, which slopes and winds by degrees till it enters the ghastly and tremendous Alan-pot. We went a hundred and fifty seven yards along this antre vest * till we came to a steep rock full twelve feet perpendicular; Here we stopped; a wise consideration! We might have descended perhaps without danger, but the question was how we were to get up again; which, without ropes or a ladder, would be totally impracticable: At the far end was an elegant lofty dome, called by the country people St. Paul's. There is no doubt, but if we had ventured farther, we might have come to Alan-pot, at least so near, as either to have seen the water that stagnates at its bottom, or the light that is admitted into this gaping monster of nature.

There are several other caves all along from hence on the south side of Ingleborough, above the village of Clapham, to Ingleton. But we postponed the pleasure of exploring these hidden recesses of nature till another summer. We descended from hence along the banks of the river Ribble four or five miles farther to the village of Horton, situated at the bottom of the

* See Shakespeare's Othello, Act I.
lofty and elegant mountain Penegent. As we went along we passed a large heap of small round stones, called an burden: We were told there were two other by the side of the turnpike road, in a field called the Slightly, one about a mile, and the others a mile and a half east of the Chapel in the dale. They seem evidently placed there by human hands, and what was most extraordinary, they were all small, round, sandy, and gritty stones, and all the stones on the surface of the ground near them are limestone. No doubt they were tumuli of some deceased chief-tains in the neighbourhood, or who died on their travels.

Before we left Horton we visited some natural curiosities of the cavern kind on the base of Penegent.* Dowgill-scar, a little above Horton is a grotesque amphitheatre of limestone rocks composing an high precipice, which must appear awful and grand in a flood, when a large torrent of water falls from the top, full in view: A small subterranean passage was able to take all the water, when we were there. A romantic gallery on the north side in the rocks, had a good effect in the scene. About a mile or two above Horton, upon the base of Penegent, we visited Hulipit, and Hunt-pit holes: The one, if we could have descended into it, would have appeared like the inside of an enormous old Gothic castle, the high ruinous walls of which were left standing after

* The word Pen is of Pharnician extraction, and signifies head or eminence. It was first introduced into Cornwall, where the Pharnicians had a colony, who wrought the tin mines. Hence we have many names in Cornwall which begin with pen. Most mountains in Wales begin with pen. In Scotland the labial letter P is changed into B, and Pen into Ben, as Benlumond, Benruiife, &c.
after the roof was fallen in. The other was like a deep funnel, and it was dangerous to come near its edges. Horton-beck or brook runs through the one, and Bransil-beck through the other of these pits, but through which I cannot remember; they each run underground near a mile; Horton-beck appearing again at Dowgil-scar, and Bransil-beck, at a place called Bransil-head. But what is most extraordinary, these subterranean brooks cross each other underground without mixing waters, the bed of one being on a stratum above the other: This was discovered by the muddy water after a sheep washing, going down the one passage, and the seeds or husks of oats that were sent down the other. About a couple of miles from Horton, on the right hand side of the road to Settle, is a curious stone quarry, at a place called Culms or Cuums: The stones are of a blue kind, like slate, from one to three inches thick: Some are two or three yards broad, and five or six yards long; they are made use of for floors in houses, being sometimes laid over cellars on joists; they are also used for gate-posts, foot-bridges, and partitions between the stalls in stables and cow-houses.

At Stainforth, which is about three miles from Horton, and two from Settle, we were entertained with two cascades, one in the Ribble, near the road, about six or eight yards high, and another a little above the village, perhaps twenty or thirty yards perpendicular.

About a quarter of a mile before we arrived at Settle, we turned to the right, along the road towards Kirkby-Lonsdale, about a mile, under the high and romantic rocks called Gigglewick-scar.
fear; in order to see the well by the way side, that ebbs and flows. We were in luck, seeing it reciprocate several times while we were there, and not staying above an hour. We could not however learn, with any degree of certainty, by what intervals of time, and to what heights and depths the reciprocation was carried on. We were informed that if the weather was either very droughty or very wet, the phenomenon ceased. I have seen some philosophical attempts to solve this extraordinary curiosity on the principle of the syphon, but in vain; as on that hypothesis, if the syphon is filled by the spring, it will flow on uniformly for ever. We are told by drunken Earnaby, a hundred and fifty years ago, that it puzzled the wits of his age.

Veni Gigglewick, parum frugis,
Profari tellus, clausa jugis:
Ibi vena propere
Fruit, refuit, noluit, cie;
Necque nurum unde vena,
An a fale nee arend.

Thence to Gigglewick most liverly,
Hem'd with shelves and rocks of peril,
Near to th'way, as a traveller goes,
A fine fresh spring both ebbs and flows;
Neither know the learn'd that travel,
What procures it, salt or gravel.

Two country gentlemen, about thirty or forty years ago, professed something more successful in the issue of a paper war that was carried on between them, to the great amusement of the neigh-
Neighbourhood: Nothing however was determined or contended for about this well, so famous in history, but whether it was a natural curiosity or not.

As we approached towards Settle, in our return, a white rock like a tower, called Castleber, immediately above the town, and about twenty or thirty yards in perpendicular height, engaged our attention. We were told a curious anecdote of this rocky mount. As limestone was daily got there to supply a kiln at the bottom, the inhabitants had the lime-burner prevented at the court of the lord of the manor, fearing that if any more was dug out, the rock might fall and bury the whole town in ruins, a stone having once tumbled down and broken through a garden wall beneath, in its impetuous course towards the houses. Twelve wise and just men were impannelled as jurors, and sent to view this impending nuisance; the verdict they returned was, that if ever it fell, it would tumble not towards the town, but the direct contrary way. On the other side, it rests against the base of an high mountain. The hills and mountains all round were limestone to a prodigious depth; yet, strange to tell, we were informed there was a monopoly of this commodity, one lime-burner or company of lime-burners having engrossed the whole of it.

Settle is irregularly built, has a large and spacious market-place, but not many good houses in it: Though by no means an inconsiderable town either for trade, riches or number of inhabitants, it has no church or chapel. The church is at Giggleswick, about a mile off, which appeared to be the court end of the parish.
From Settle we proceeded eastward over the moors and mountains about half a dozen miles, to Malham or Maum, in order to see some other natural curiosities of the precipice and cataract kind. We had already indeed seen so many, that our wonder could not easily be excited, except they were more great and terrible: As such we had them represented at Settle, or else we should scarce have left the turnpike road; and when we saw them we were not disappointed, for great and terrible they are. The first was Malham-cave (or vulgarly Maum-cove) though it has properly nothing of the cave about it. It is a fine amphitheatre of perpendicular limestone rock on the side of the moor, at least a hundred yards high in the middle. The rocks lie stratum upon stratum, and on some there are saxy sedilia or shelves, so that a person of great spirit and agility, but of small and slender body, might almost walk round. A small brook springs out at the bottom of the rocks; but in floods the narrow subterranean passage is not able to give vent to all the water, when there pours down a stupendous cataract, in height almost double that of Niagara. This is the highest perpendicular precipice I have ever seen, and I think not enough known or admired by travellers for its greatness and regularity. After pursuing our journey near a mile, by the side of the deep and romantic channel of the river Air, which washes the base of many a rugged and high precipice in its impetuous course to the vale beneath, we came to Gordal, the highest and most stupendous of them all. The prospect of it from the side of the opposite western bank is awful, great and grand. After viewing
viewing for some time its horrid front with wonder and astonishment, we were tempted to descend with care and circumspection down the steep bank on the west side to this river, which being interspersed with trees and shrubs, enabled us to rely on our hands, where we could find no sure foothold. The water being low we met with no difficulty in stepping from one broken fragment of the rocks to another, till we got on the other side, when we found ourselves underneath this huge impending block of solid limestone, near a hundred yards high. The idea for personal safety excited some awful sensations accompanied with a tremor. The mind is not always able to divest itself of prejudices and unpleasing associations of ideas: Reason told us that this rock could not be moved out of its place by human force, blind chance, or the established laws of nature. We stood too far under its margin to be affected by any crumbled descending fragment, and a very small one would have crushed us to atoms, if it had fallen upon us; yet in spite of reason and judgment, the same unpleasing sensations of terror ran coldly through our veins, which we should have felt, if we had looked down, though secure, from its lofty top. Nothing however fell upon us but a few large drops, which sweat from out its horrid prominent front. Some goats frisked about with seemingly a wanton carelessness, on the brink of this dreadful precipice, where none of us would have stood for all the pleasant vales wash'd by the river Air. Some lines in Virgil's Eclogues seemed to receive additional beauties when repeated in this grotesque scene.
A TOUR TO

Non ego vos posthac, viridi projectus in untræ,
Dumæa pendere precæ de rupe videbo;
Virgil Ecl. I. 1. 76.

No more extended in the grot below,
Shall I e'er see my goats high up the brow,
Eating the prickly shrubs, or void of care
Lean down the precipice and hang in air.

A little higher up is a fine cascade, where the river striving for an easier and gentler descent, has forced a way through the rocks, leaving a rude natural arch remaining above. If a painter wanted to have embellished his drawing of this romantic scene with some grotesque object, he could have added nothing which would have suited his purpose better; if nature had not done the work for him.

* From Gordal we proceeded to a curious lake called Maum or Malham-tarn, abounding with fine trout, upon the top of the moor; and from thence by Kilsey-crag to Grassington, on the banks of the river Wharf. Coming unexpectedly to the crags of Kilsey, I was a good deal amazed at the prospect. They are by the side of the vale, along which descends the river Wharf: Like those at Giggleswick, they extend in a line to some distance, but are higher and more prominent. The road we came along winded down amongst these crags, so that we were presented with a full-view of them on a sudden, which caused the greater surprise. After having refreshed ourselves at Grassington,

* If Kilsey-crag should not be thought an object worth going six or seven miles to see, the best way from Gordal to Skipton, will be by Kirkby, Malhamdale, and Gargrave.
we travelled about nine miles further and came to Skipton. The country all round is uneven and rugged; the vales are fertile on the surface, and the mountains beneath it abound with rich mines of lead. After we had visited the castle (which belongs to the Earl of Thanet) and the curious canal behind it, above the mills, which leads to the limestone quarry, by the side of a romantic deep glen, we left Skipton. Before our departure we were for some time in doubt, whether we should ascend the steep and black hill of Romaldsnoor, and so proceed down the vale of Whardale, one of the pleasantest in England, to Otley, and so to Leeds; or go by Keighley, Bingley, and Bradford, along the side of the new canal, and view the locks and other contrivances on this new and useful work of art. Most of us having been the former road, and this with its objects being quite new, we were induced to proceed along it. At Kildwick, about four miles from Skipton, we passed under this aqueduct, where it was banked up a great height above the adjoining lands at a vast labour and expense: There have been some violent struggles between the elements of earth and water; the mounds have not always been able to keep the water within its proper limits, they having, oftener than once, been broken through by the pressure on their sides. About a mile further, at Streton, we could not but observe the steep ascent and descent of the road over a hill, when a level path might have been made almost equally near along the side of the river. The inconveniences that must attend carriage in carts and waggons, from such ill-concerted roads, perhaps might suggest the expediency of a canal.
The use and practicability of such an undertaking in a mountainous country, one would imagine might give the inhabitants a hint to make their roads wind with easy ascents and descents along the sides of the vale. From Skipton to Otley the road is carried up and down the corner of the steep mountain Ronaldsmeer, when as near a one might have been conducted along the vale beneath. The inhabitants might have carried to the market the produce of their lands, and brought coals and manure at a little expense, if this plan had been adopted; but the prejudices against improvements and innovations are not easily removed. At Bingley we were entertained with the locks; there are five or six of them together, where the barges ascend or descend eighty or ninety feet perpendicular, in the distance of about a hundred yards. They are elegant and well finished, but seem too deep not to leak and be frequently out of repair. The act was procured some eight or ten years ago, to make a navigable canal from Leeds up to Skipton, and Colne, and from thence by Walsley, Layland, and Ormskirk, to Liverpool, being quite across the kingdom. As in most works of this nature, which are extensive and of a new kind, the estimate fell far short of the expence. Only the two extremities are finished at present, from Leeds to about four miles above Skipton, at one end, and from Liverpool to Wigan on the other. If the whole was completed, no doubt but it would prove of great public and national advantage. Like that of the new river to London, undertakings of this sort often ruin the first adventurers, and make the fortunes of those who are able to complete and extend the original plan.
About four miles before we arrived at Leeds, in our way from Bradford, we were suddenly presented with the grand and venerable ruins of Kirkstall-abbey, full in view from the road: We stood some minutes looking with silent respect and reverence on the havoc which had been made by time on this sacred edifice. How much sooner we might condemn the mistaken notions of monkish piety, that induced the devotees to a lethargic supineness, and to forgo all the social duties of life in order to be good men; yet we secretly revered that holy zeal which inspired them to exert every power in erecting structures, the magnitude and beauty of which might excite ideas worthy of the Deity to whom they were dedicated; and also reprobated that fanatic bigotry which suffered them to decay and go to ruin, because they were once inhabited by a set of christians whose manner of worship was not orthodox. While we were moralizing thus on religious prejudices, the instability of the work of men's hands, and the fading glories of this world, we came to Leeds.

As the largeness and extent of this thriving manufacturing town, with all its elegant buildings in and about it, are well known to you, and, as you have also seen every thing worth notice in and near the road from thence, I shall here take my leave of you, and no longer tire you with a relation of the adventures and curiosities I met with in my summer's journey.

Before I finish my letter, however, I cannot but lay before you a few conclusions of a philosophic nature, which, I think, I was able to draw with some degree of exactness, from the data or natural principles I met with amongst the mountains.
I. It appears to me obvious enough, that all the
marbles and limestones we saw, were made up of
tesselaceous and pisiform clicks, or of the shells and
other parts of fish. There were visible in all
the rocks, whether of the higher or lower strata,
shells of all the different species, and in every
stage of existence; some small or young, others
full grown; some in a state of decay, broken
and eaten through in holes by worms to get at the
fish; others bivalve, with both their valves enti-
tire. The teeth and bones of various sorts of
fish are discernible in the midst of the solid
rocks. The shells found at the bottom of the
sea, and in the limestone, have the same proper-
ties and effects, whether analysed chemically, or
made use of in medicine or agriculture. It has
been contended for by some, that they are nothing
else but the sportings of nature, or the effects of
crystallization, when the soft pulpy matter in
which they inhered, became fixed and solid.
But the laws of crystallization seem exceedingly
different to these; the crystals in any one salt
or composition are all similar and homogenous,
and not diversified thus with imitations of all the
animals, or separate parts of animals, in the
most prolific and inhabited element. The ni-
trous acid, and fossil alcali, crystallize always in
cubes; some calxes of metals united with acids,
shoot into stars, and every new generated com-
position has its parts formed by its own peculiar
rule. If a person had never seen a hay-stack
before, he would have no doubt, after a little
examination, but that its contents were once in
a state of vegetation. Whoever observes the
stems, leaves, and roots of different vegetables,
and nuts, acorns, and the decayed fruits of
plants,
plants, shrubs, and trees, in the middle of peat­moss, though many feet below the surface of the earth; will not hesitate, after a proper inspec­tion, to pronounce, that they once vegetated like those of the kind they so exactly resemble. I believe, no proposition in natural history is more obvious, than that all the calcareous stones, viz., chalks, marbles, gypsiums, and limestone, in this kingdom, are made up of shells and other parts of marine animals.*

II. From every appearance we saw, it was obvious that the marbles and limestone had been once in a soft pulpy state, approaching nearly to fluidity. † Upon the bases of Ingleborough, Pen­negent, and Maun-moor, the tops of the rocks were channelled and scalloped in different di­rections. The excavations were narrowest and shallowest in the higher parts, and encreased in depth and wideness down to the edges of the rocks: They had the same appearance as those little channels upon the banks of the sea lands, made by the tide draining off near the course of some stream; or those that are formed by heavy rains running down the sides of roads in

* The rock at Gibraltar, and several mountains in Balm­arua, and no doubt, many others in different parts of the world, are made up of bones, not only of every animal exist­ent in nature, but particularly of those of the human species.

† This proposition follows indeed without any further proof from the preceding. For if these rocks be made up of shells, they must have been dissolved in some me­triumm, or mixed up in some mucilage, like plums in a pudding. If my intelligence is right, the composition of sand, salt, mud, and marine exuviae, which was dug up in making the docks at Liverpool, became hard and concreted, when exposed to the action of the sun and air.
in a sandy or miry country. There is no possibility of their being worn by all the rain since the creation, if the rocks were still in their present hard and durable state. The rocks were not ever continued entire above a few yards, but were broken into chimneys and fissures from one, to two, or three yards deep: No doubt this was the effect of the soft matter of which they originally consisted, being dried by the rays of the sun, and of consequence being made to shrink up into less dimensions. Something similar to this, though in an inferior degree, we perceive on the mud in the bottom of a pool, when the water is exhaled by the sun and the bottom dried up. Wherever the waters of an adjoining spring were diffused and spread on the surface of the rocks, so as always to keep them moist, they were the most free from chimneys and crevices. The under strata of rocks, and those beneath the foil, were found to be much more compact than those exposed to the sun and air. From these principles we accounted for the channels of the river, being worn so deep in a limestone country, where the bed was originally so soft; and also for the caves and subterranean rivers. If a small stream at first found a passage between the strata and fissures of the rocks, it would soon wash itself a wider passage amongst matter that had so little tenacity. The deeper below the surface of the ground the vein might lay, the longer it would continue to wash the body of stone through which it passed, as it would be a series of years before the sun and air would produce any considerable resurgent effects, so far out of their direct influence. Why the parts of which marbles and limestones are composed cohere so firmly
firmly, and become so hard by being exposed to
the sun and air, I leave the chymilts to deter-
mine. Perhaps it may be in a great measure,
if not entirely, owing to the fixt air they con-
tain; for when it is expelled by fire and they
are exposed to the open atmosphere, they crum-
ble and dissolve into particles smaller than sand;
after this dust has again imbibed the particles
of fixt air, it becomes a second time marble or
limestone.

III. To account for these marine productions
being elevated so far above the bottom of the
sea, is a task more difficult than the solution of
either of the former propositions. It appears
to me that no other secondary cause can solve
this phenomenon, but an alteration in the di-
urnal rotation of the earth round its axis. This
principle indeed would not only account for
marine exuviae being found on the highest
mountains, in the interior parts of large con-
tinents, but for a variety of other phenomena,
which appear inexplicable on any other hypothe-
sis. Let us suppose such an alteration to take
place, either by the impact of a comet, * or any
other secondary cause in nature, or by the imme-
diate agency of the creator; and investigate the
consequences that would of necessity follow from
such

* Mr. Whiston, in his Theory of the Earth, endeavours
to account for the deluge, and the irregularities on the
surface of the globe by the approach of a comet very near
to it, not however by altering its diurnal rotation by im-
pact or otherwise, but by the great tides and other surpri-
sing effects that would follow from its attraction, and the
vapour which would fall from its tail.—The comet ob-
served by Sir Isaac Newton, in 1680, the period of which
that great philosopher computes to be 575 years, Mr.
Whiston thinks came near the earth at the deluge.
such a change. If the world was originally all in a fluid state, or, however, if the matter of which it was composed was very soft and pliant, as is the supposition of Sir Isaac Newton, and some other great philosophers, it would be perfectly round, if it had no motion round its axis. The different strata would be diffused in concentric sheaths round it at different depths according to their specific gravities: Land, most probably, would soon be accumulated in various parts, by the tides caused by the sun and moon, and waves excited by the winds and storms, driving the earthy parts at the bottom of the ocean into great banks and islands. Their greatest altitude however above the surface of the adjoining seas could never be many yards from this cause. If the earth was from this state, made to revolve round its axis, as it does at present, once almost in twenty four hours, the most violent commotions would ensue amongst all the different elements. First, there would be an impetuous east wind, from the earth's revolving from west to east, till it had communicated its motion to the atmosphere. * Incessant rains and great winds and storms are always concomitant, "Thus would the windows of heaven be opened." Second, as the velocity of the earth's rotation increased, it would become more and more an oblate spheroid from the increased centrifugal force at the equator. † The waters would

* This circumstance is mentioned in the eighth chapter of Gray's, verse first.
† The earth revolves round its axis once in twenty three hours, fifty six minutes, and four seconds. At the equator,
THE CAVES.

Would first conform to this new shape, as most easily put in motion: In their course towards the equator they would flow over all the lands; for, the parts about it are at present at least seventeen miles farther from the center of the earth, than those near the poles. Thirdly, As the force in the equatorial regions to fly off from the center increased, the terrestrial parts themselves would begin to ascend, for we cannot suppose their tenacity to be great as not to be broken by a force equal to the weight of a column of earth and water seventeen miles high. The ocean no doubt would find many a subterranean passage, and by its pressure upwards, heave up the superincumbent strata, and make its way through various chasms to the surface. Thus would all the fountains of the great deep be broken up, as mentioned in the seventh chapter of Genesis. The strata also would be torn up and thrown one upon another in the most rude and irregular manner, with every possible inclination and direction, since there would be such a great variety in their specific gravities, and strength of cohesion, as would render it impossible to reduce them to any certain laws.

IV. But this is not all, the waters would be admitted to the burning strata and subterranean fires, which would cause the greatest convulsions in the centrifugal force, as to the whole force of gravity, as 3: 289; so that each body loses 1/3 part of its weight. The equatorial diameter of the earth, is to its polar diameter as 250: 220. — Hence, if the diameter of the earth, according to the admeasurement of Pluart, be 7846 miles, the equatorial regions will be higher than the polar by 174 miles. — See Sir Isaac Newton's Principia, book III. proposition 19.
in the bowels of this globe. Earths, stones, and fossils, of various sorts, would have their natures changed by heat, and all the different degrees of vitrification and calcination; large mountains would be heaved up above the irregular masses of rocks and different strata that were laid in confusion by the globe’s centrifugal force; and vast quantities of loose earth and stones would be thrown and dispersed in every direction to a great distance and depth, by the bursting and explosion of volcanos.

As some new principles are advanced in this fourth article, it may not be improper to explain and prove them a little more particularly. Few naturalists make any doubt of burning strata, to a vast extent, at all different depths below the surface of the globe. Several of them emerge in consequence of their elevated direction into open day, and spread terror around them in volcanos and burning mountains. The steam arising from boiling water is the most classic vapour of any we are acquainted with in nature: It is at least thirty times stronger than fired gun-powder; and according to Mr. Michell’s computation (in his excellent Treatise on Earthquakes, published in the Philosophical Transactions, Vol. 51, part 13, No. 55, page 566, for 1760) sufficient to heave up the ground at the depth of ten miles. Whenever water is poured on one of these burning strata, from the consumed roof above giving way, it will be immediately converted into steam, and proceed with an undulatory motion under the ground, shaking every thing above (like the air under a carpet, when the edge is taken up and suddenly let down) till it either get vent at the surface in some volcano, or till it arrive at the extremities of
of the ignited matter, where it will of consequence be condensed by the cold, and deprived of its elasticity and force. On the first of November, 1755, when Lisbon was destroyed, the sea and land were agitated to an extent of near 3000 miles in diameter. The burning stratum which was the cause of this dreadful calamity, must have been at least of the like dimensions.

History abounds with a variety of examples of islands raised from the bottom of the sea, and mountains upon land, by earthquakes. Delos and Rhodes, are recorded to have grown out of the sea; Thera also and Hiera, in the same neighbourhood, are mentioned by Pliny to have a like origin. In later times we have many such accounts: In 1628, one of the Azores, near the island of St. Michael, rose out of the bottom of the sea, which before was 160 fathom deep. The isles of St. Helena, and Ascension, in the Atlantic ocean; those of Otaheite, &c. in the Pacific; and the Moluccas, in the Indian sea, afford great room for conjecture, from their contents, to have had a like original.

For a farther account of islands and mountains thus raised, see Mr. Mitchell's conjectures on earthquakes, before alluded to. No doubt but Etna, the Pico of Teneriffe, and the Andes, in South America, the highest mountains in the world, were originally caused by volcanos, as they are annually augmented by this cause. When the thickness and cohesion of the superincumbent strata in any place becomes small, in comparison of the elasticity of the vapour, and the weight above in every other direction, there is great reason to suppose the vapour will
there force its way to the surface, elevating the earth in its eruption.

We have a variety of cases on record, where ashes, sand, loose earth, stones, and cinders, were dispersed in vast quantities in all directions, by the eruptions and explosions of volcanos, covering the earth to a great depth. In the year 79, the eruption of Vesuvius overwhelmed the two famous cities of Herculaneum and Pompeii, four and six miles distant, and totally covered them many feet deep, as the people were sitting at the theatre. In the year 1640, a volcano in Peru threw out a shower of ashes, sand, stones, &c. which covered all the land thirty leagues one way, and forty leagues another, from eight or nine inches, to six feet deep: Whence it appears that an area of ground above 34,000 square miles was thus covered. From this principle we may easily account for detached pieces of limestone, freestone, or any other sort of stone being found at a great depth, a long way distant from the strata and rock from which they were originally separated.

If such strange alterations have been made on the surface of the globe by earthquakes, since the commencement of history, nay, even in our own times, what terrible effects must have been produced, when the whole world was shaken to its center, when fire and water were admitted to each other in every region and at every depth? It may be observed, that it is not necessary for the establishing this theory, to suppose that the earth before the deluge had no rotation round its axis: The same consequences would follow, though in a different degree, if the earth had a less or greater velocity round its axis than
than at present, or round a different axis. If the density of any planet remain the same, the spheroid; that is, the difference between the diameter of the equator, and the polar diameter divided by the diameter of the equator, will vary in an inverse duplicate ratio of the time of rotation round its axis. See Newton's Principia, b. 3d, p. 19. But to return from these great and general principles to the solution of the few and inconsiderable phenomena, that came under our observation, whilst among the mountains and caves.

On the sides and tops of Ingleborough, Whernside, Penyghent; and the other mountains in that quarter, there were visible marks of the effects of fire, as vitrifications, calcinations, &c. As the mountains rose up, the loft matter of which the limestone originally consisted, appeared as if it had flint down and been shrowded by its own weight to their bases and vales beneath. A thin stratum that was still left on the level top of the fell, on the east side of Ingleborough, seemed to favour this supposition. To account for

*This last hypothesis is probable, from the bones of many tropical animals, as the elephant &c. being found in a fossil state, in Russia, Siberia, and the arctic regions; for none of those animals can live in these climates at present. There are no elephants, lions, tigers, rhinoceroses, leopards, camels, dromedaries, camels, hipposamuses, or many other tropical animals, to be found in America; a strong argument for the universality of the deluge. For, the wolves, bears, elk, and those of the deer kind, and other animals that were found amongst them, were such as could bear the cold, and may be supposed to have travelled from Europe over the ice to the Greenland, and the region about Hudson's-bay; or from the eastern parts of Asia to America.
for the prodigious thickness of the limestone strata about Ingleborough, and indeed in every other part of Great Britain where it is found, may perhaps be thought a task of some difficulty: Amongst the mountains above recited, there appears to be, not only the quantity of limestone which covered the same area at the bottom of the ocean, as that on which it rests at present; but also what has been on the bases of the mountains themselves, which has rolled down their sides as they were raised above their first height: Might not also matter of the same specific gravity, and of an homogeneous kind, be driven to one place, and a number of strata accumulated one above another?

Mr. Michell, in order to solve this apparent difficulty, in a treatise he wrote on this subject, and published in the Philosophical Transactions about fifteen or twenty years ago, supposes the waters were occupied by shell fish, and other marine animals, for a long duration, before the world was habitable for man. This he thinks was the case during the earth’s chaotic state, “when it was without form, and void, and when darkness was upon the face of the deep.” Genesis, chap. 1st, v. 2. But, if what Mr. Whitehurst tells us in his enquiry, be true, we have no occasion to have recourse to this hypothesis: He says, the increase of shell fish is so great, that it is not uncommon to take away a bed of them several fathoms in thickness, so that none are left remaining, and yet the next year there will be as many found in the same places as before; nor does he remember to have heard, that any place, whence they were taken, had been entirely exhausted. See page 36.

Dr.
Dr. Donati, an Italian gentleman, made several experiments in the Adriatic sea, all which tend to prove the vast encrease of marine exuviae, and that all calcareous stones are made up of them. In the 49th vol. of the Philosophical Transactions, part II. for the year 1756, we are told, that he contrived instruments, by which he took up, even from a very great depth, marine bodies and masses of a considerable bulk: He observed that there was very little difference between the bottom of the Adriatic sea, and the surface of the neighbouring countries. He found at the bottom of the sea, mountains, plains, valleys, and caverns, just as upon the land, with a variety of different soils, which he ascribed to the nature and quantity of plants and animals found there also. Some places were inhabited by a number of different species of plants and animals; in others, only some particulars were to be found; and there were other places where neither plants or animals were to be met with: he found in some places human bones petrified, which formed one mass with a mixture of marble, red earth and flintelites.

One of the objects, which most excited the attention of the doctor, was a crust, which he discovered under the water, in divers places, and to a great extent. It was a composition of crustaceous and fossilaceous bodies, and beds of polypes of different kinds, confusedly blended with earth, sand, and gravel. These different marine bodies, which enter into the composition of this crust, he found at the depth of a foot or more entirely petrified and reduced to marble: at the depth of less than a foot, they approach nearer to their natural state; and at the surface of this crust they are either dead, though extremely well preserved, or still living. Dr.
Dr. D'Anast remarks, that in several places the polypes, skeletons, and marine exuviae formed great banks and beds of considerable thickneth of the sea is continually rising higher and higher, from the vast accumulation of them.

It is a received opinion amongst many naturalists, that coal was originally peatmois, this fossil having been found in every intermediate state, nay, sometimes with wood in it, and often with the marks of leaves, roots, branches, and fruits of different plants, shrubs, and trees, on the sides of broken fragments. To this doctrine we were made proselytes, being presented with some pieces of coal that were got near the top of Wernside and the other mountains, that seemed more like dry clods of peatmois than coal, though distinguishable enough to belong to the latter clays. The principal difference in their composition is, that coals abound with the vitriolic and peatmois with the vegetable acid. The vitriolic acid is diffused through every subterranean stratum; hence, if a quantity of earth should be superinduced above a stratum of peatmois, the vitriolic acid that would oufe through, must in time change its nature and turn it into coal: The deeper it lay below the surface of the ground, the more it would be impregnated with this fossil acid, and consequently be the more inflammable. If a stratum should be near the top of a mountain, there is the less chance that it should be well fed.

In all the deep winding vales which we visited, it was curious enough to observe the regular descent of some river out of them. It might have been expected, that at the deluge, many
of them would have been left full of water as high as the mountains on each side, which would have remained imbarked until now. But when we consider that the force which a fluid exerts by its pressure to overthrow any mound, is as the cube of the depth, and the strength of the mound to oppose it, only as the square of the horizontal breadth, the surprise vanishes. * For if the depth of a vale was half a mile, or only a quarter, the pressure would be able to remove any mountain that we saw opposed against it. It is here supposed that the banks were so compact as not to admit any water within their crevices; if that was not the case, the force to overturn them will encrease in a higher ratio, from the pressure downward of the banks being lessened by the water partly buoying them up. If they were left at the deluge in a less hard and tenacious state than at present, which was most probably the case, the pressure of the waters would have still a greater effect on these banks than at present. Windermere-water, Ullswater, Derwent-water, and the other lakes, are undoubtedly in the cavities of vales, but then the height of their surfaces above the level of the sea is but a few yards and therefore their pressure small.

* If the side of a bank next the water is perpendicular, and so contrived, that there is as much probability that it shall be broke down by the pressure of the fluid it opposes in one part as soon as another, the perpendicular section will be a parabola; the curve of whose absciss of depth will every where be as the square of the ordinate or breadth, so that the bank must be hollow outward, and encrease much faster in breadth than in depth, to be supported from being overturned by the pressure of the imbedded fluid.
We have no great reason to conclude, that there are many empty cavities, of any great magnitude, below the level of the sea: They are most frequent in limestone countries, or those abounding with a calcareous stone, and seem to be worn by the currents of water running among the strata, while in their original soft slate; but, below the level of the sea we can have no such currents, and consequently no cavities formed by this cause. The calculations to ascertain the densitie of the earth, which were made by Mr. Hutton, of Woolwich, from the observations of Dr. Maskelyne, the Royal Astronomer, on the mountain Bensteallien, in Perthshire, prove beyond a doubt, that the earth is much more compact and dense in its interior parts, than near its surface. By some nice observations, these ingenious gentlemen were able to ascertain the force of attraction of this mountain, when compared with that of the whole earth, and consequently the quantities of matter they each contained. And from an exact adjustment of the magnitude of the mountain, and of the earth also they could compare their bulks; from which principles they could easily find the ratio of their densities, which is, as the quantities of matter directly and bulks inversely.

The mean density of the whole globe of the earth, is found to be to the density of this mountain in the highlands of Scotland, nearly as 9:5. This mountain is composed of firm rock, the density of which is to that of water as 5:2. Hence, the mean density of the whole earth is to that of water as 9:2, or as $4\frac{1}{3}$:1. It is most probable then, that the heaviest and richest ores lie in the greatest quantities at a vast depth be-
low the surface of the globe. From hence may be shewn, that the depth of the sea is not so immense as some vainly imagine, that there are none of those vast abysses below the surface of the ground, which some have conceived, who have supposed the earth only an incrustation over these vast profundities of waters. All foundation also for the supposition of a void between the shell of the earth and nucleus or kernel (if any, as supposed by Dr. Halley, in order to account for the variation of the mariner’s compass) is made to vanish by this investigation. The solution of this curious problem does the greatest honour to the philosophers and mathematicians of the present age. By means of this discovery, and of the horizontal parallax of the sun by the transit of Venus, a few years ago, we can, not only compare the density of common water with that of the earth, but also with that of the sun, and almost all the planets.

Being amongst these mountains at the sources of many rivers, we had a fine opportunity to speculate on the origin of fountains. It has been supposed by some, that vapours are raised by subterranean fires from abysses in the interior parts of the earth, which become condensed in the caves, crevices, and crannies of the mountains, and parts near its surface, like an alembick, and to distill out of its various orifices and perforations. In all our subterranean excursions we perceived nothing of this fire, or had any reason to believe its existence. Though we met with many streams below the earth; yet, we could easily find they originally descended from its surface, and not from any distillations against the sides of the caves; so we were ‘easily persuaded
suaded to explode this hypothesis. Others have suppos'd, that there are various communications between the bottoms of mountains and the sea; that the sea water there ascends by the attraction of cohesion, like a little tea in the bottom of a cup to the top of a piece of sugar) till it arrives at the earth's surface, and sometimes to the top of the highest mountains, when it issues out at their sides in form of springs, having lost its saltness by filtration through the different strata of earth. There is no reason, from any discoveries yet made below the ground, to believe that there are any such communications with the sea. If there were, the water would arise but a few inches, not above a foot or two above the level of its surface, from this cause, which would also suspend it at the height it elevated it, so that no reflux could take place. By the finest filtration that has yet been made, the sea water is as salt after it, as before; so that it could never by this means be made fresh. After a minute examination of these, and some other hypotheses, we had recourse to the most plain and obvious cause, and concluded, that fountains had their origin from the descent of vapours. We applied the same rule to philosophy, that Horace does for poetry, viz.

_Nee Deus interstis, nisi dignus vindice nodas._

Never call in the assistance of a god, except there is work worthy of his divinity.

We found that the springs were entirely dependent on the rains; were dried up in a drought, were fluent in wet weather; that there were
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were none on the very top of Ingleborough, Whernside, or the other mountains: though they began to be burst out of their sides near their summits; but at a sufficient distance for the rain water to be accumulated. It is found by observation, that evaporation is less, and the quantity of rain which falls is much greater on the tops of mountains, in a given time, than in a flat and level country, which may account for many rivers having their greatest supplies from them: * A branch of the Lune, the Ribble, Air, Wharfe, and a branch of the Toure, all descend from the mountain Cam, near Ingleborough. The Swale, a branch of the Toure, and one of the Lune, the Eden, and Tees, all descend from the mountain Cotter, between Yorkshire and Westmorland, not above ten miles from that of Cam. Many of these rivers are in summer time, when the season is dry, as fluent when they issue out from amongst the mountains, as they are when they fall into the sea; though in their course they receive several additional streams, owing to the vast waste from evaporation. All the rivers that fall into the Mediterranean sea, are not able to supply the loss from this cause, so that a strong current sets into the straights of Gibraltar, out of the Atlantic ocean, to supply this deficiency. The river Niger in Africa, one of the greatest in that quarter of the world, when it issues from amongst the mountains of the moon, where it has its origin, is at last exhaled.

* The quantity of rain which fall in a year at the foot of the Lancashire hills, facing the Irish sea, was found by Mr. Townly to be forty inches in perpendicular depth; which was more than double the quantity in the same time at Uppington, in Essex, as observed by Dr. Hooker: Or at Paris, as observed by the French academicians.
haled and dried up in the sandy deserts of Ne\-go-
lānd, without ever arriving at the ocean. (See Dr. Goldsmith’s Natural History, vol. I.) From want of a due attention to the quantity of water exhaled by evaporation in open and level countries, no doubt but many engineers will find they have made their navigable canals too broad for the supply of water they were able to procure, from the neighbouring springs and rivers. Though the brooks and rivers in this part of York\-shire, as in other mountainous countries, frequently are swollen with rain, so as to fill their channels, yet these floods are but of short continuance, owing to the narrowness and the declivity of the beds of these channels, which cause the water to have a great velocity, and quickly to make its way to the ocean or more level countries, where, if the river is wide, or if it passes through large lakes, the effects of the flood will be more durable; the velocity of the stream being inversely as the area of its per-
pendicular section. After great and sudden rains, it is some days before any effects of a flood are perceived at the bottom of Windermere and other lakes in that neighbourhood, though the rivers which emptied themselves in were im-
mediately greatly encreased.

While we were amongst these mountains, from our own observations, and the information of our guide, we were able to make some new improvements on, as well as confirm the general principles of, the new theory of the ascent and descent of vapours; first fully explained and published to the world by Dr. Hamilton, of Dub-
līn, about fifteen or twenty years ago. But in order to explain our refinements on the Doctor’s theory,
theory, it will first be proper to premise his leading and general principles. I shall not trouble you, by way of introduction to it, with endeavouring to explode the several hypotheses that have been made for this purpose, for they are already exploded.

Dr. Hamilton supposes that evaporation depends on the same principle as that by which salt or sugar is dissolved in water, or any other body, solid or fluid, in any other fluid, which he calls a dissolvent or menstruum. When this menstruum will dissolve no more, he calls it satured; when the dissolved body begins to separate from the menstruum or to subside, it is said to precipitate:

As the principle is chemical, chemical terms are adopted.

1. Heat or warmth he finds is not necessary for evaporation or solution, though it will promote it: Thus water and ice will evaporate in dry frosty weather, though faster in warm weather. Warm water will dissolve salt faster than cold, and in greater quantities before it is satured; which, as the water cools, will precipitate. Hence, every thing else remaining the same, it follows, that we shall have rain, if the weather grows colder, after a dry season, when the atmosphere becomes satured with vapour. * Whatever encreases the repulsive force of the particles of air at a given distance from

* The air is an elastic fluid, whose density is as its compressing forces; and whose particles repel each other with forces, that are inversely as the distances between their centers. If heights are taken, encreasing in arithmetical progression, the density of the atmosphere at these heights will decrease in a geometrical progression.
from their centers, may perhaps encrease the power of evaporation; but heat does encrease this repulsive force, which may probably account for this phenomenon; it will however be farther confirmed by other circumstances we shall take notice of.

2. Dr. Hamilton found, that when the air was taken away from any place, by any cause whatever, the remaining quantity of air would not support a proportional quantity of vapour; Thus, if the receiver of an air pump be filled with common air, and part of it exhausted, the remainder will not hold the remaining vapour, which may be perceived by the sides of the receiver becoming striated with water. This principle accounts for wet weather being generally foretold by the linking of the mercury in the barometer, which indicates the quantity of air being lessened incumbent over any place, as its pressure is diminished. In this case the particles of air repel each other with less force, and therefore perhaps are less able to support the particles of water amongst them. It follows from hence, also, that if the air in the lower regions of the atmosphere, being saturated with vapour, is carried up into the higher regions, where it is less dense, a precipitation or rain will ensue. The pressure of the atmosphere remaining the same, if by cold the air becomes more dense, it will hold more water before it is saturated by this principle, though less on account of the other, that of coldness.

3. Evaporation is promoted by wind, as well as heat: If that air, which is contiguous to the surface of the waters, and saturated, be carried off by wind and replaced by a new quantity, it
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It is obvious enough, that evaporation must be carried farther forward: Thus, salt is sooner dissolved in water when stirred up, than when at rest on the bottom of the vessel.

4. An haziness prevails in the air, while evaporation is carrying on in any great degree, as a cloudiness does in the water, while salt is dissolving in it: Both become transparent, on saturation, and are cloudy again on precipitation.

5. A cold is excited in the water, or on hard bodies wet, by evaporation. This principle does not seem to have been sufficiently examined, and its consequences pursued by Dr. Hamilton; for I am persuaded, it will account for several phenomena never before properly explained.

It seems very probable, that electric fire is one great cause of the cohesion between the particles of air and water, perhaps by increasing the repulsive powers of the former. Let us however pursue this theory through all its principal branches: May not the coldness produced by evaporation, be owing to the electric fire being taken out of the stagnant water along with the ascending vapour? Whenever the electric fire suddenly escapes out of the atmosphere, as in a thunder storm, the cohesion between the particles of these different elements is immediately broken, and the rain descends in the largest drops: A temporary cold also is produced, superior to any in the summer season of the year, when thunder is most frequent; for these drops of rain are almost instantly frozen into ice.
ice or large hail-stones. * Hail storms in the summer season of the year, or in hot countries, and thunder claps, are almost always concomitant, one seldom happening without the other.

These principles being premised, I shall endeavour to account first for some general phenomena, and then for those particular ones we observed amongst the mountains in Yorkshire.

The vast quantity of rain which falls among the Andes, (a chain of the highest mountains in the world, running from the north across the equator to Cape-Horn, in South America, and continually covered with snow) must be owing to the trade winds blowing off the warm Atlantic ocean, being saturated with vapour, which coming amongst these lofty and cold regions, will part with it in form of rain and snow, by the first, second, and last principles laid down. In consequence of these frequent rains, some of the largest rivers in the world empty themselves in South America, into the Atlantic ocean, as the river Amazonia, Rio de la Plata, &c.

On the western or Peruvian side of this quarter of the globe, there is little or no rain, and consequently none or very small rivers; the wind they have coming over the Andes, and blowing into a warmer region, the Pacific ocean, where it must continue some time, before it will be again saturated with vapour.

From the same causes we may account why more rain falls amongst the Lancashire mountains.

* Though air in its natural state is a non-conductor of the electric fire or lightning; yet, when heated beyond a certain degree, it becomes a conductor, which may account for thunder often in summer, and not in winter.
tains, and about Ingleborough, than in Essex and other inland level countries: The warm air that is brought by the south-west winds, which blow a great part of the year, off the Atlantic ocean, over the Irish sea, is made to go into a colder and rarer region in its passage over these mountains, where of consequence the vapour will be precipitated. The attraction of these mountains will have no inconsiderable effect, both in drawing the adjacent clouds towards them, and extracting the electrical fire out of them, which will, as before observed, be the cause of a precipitation or rain. It is a very common phenomenon for the clouds or mists, incumbent over the vale of Chapel in the dale, to part; one half being attracted to the top of Ingleborough, and the other to the top of Whernside, the mountains on different sides of the vale. Whether they are influenced by the attraction of gravity, or that from electricity, I will not take upon me to determine; perhaps both may contribute. It is found by observation, that a greater quantity of vapour falls at the bottom of an high steeple or other building, than at the top; perhaps owing to the electric fire escaping in its descent, more than to the quantity of intermediate atmosphere or the drops coalescing in their fall. The helm winds, as they are called, which blow from the top of Ingleborough, and other high mountains on the surrounding level countries, are most probably owing to the air on their summits losing much of its repulsive force by the electric fire being attracted out of it, and consequently, becoming more dense than that in the regions beneath,
to which by its greater specific gravity it will flow: The cloud or helmet being generated at the same time seems to imply it.

Why the north-ea.t winds are generally dry, may easily be accounted for from this theory: Being met by a south-well wind, which generally blows from about thirty-five degrees north latitude up to the coasts of England, the air will be accumulated over this island by these two opposite winds, and so be the better able to support the vapour; besides, that the air which comes out of the cold northern regions into a warmer climate, must remain sometime before it can be saturated with vapour. Between these mountains in Yorkshire and the Irish sea, the easterly winds are the most irregular; every gale coming in a different direction, both as to the point of the compass, and elevation or depression; owing no doubt to the interruptions they meet with in coming over the mountains and down the several vales, which wind in various directions: Few houses in this country are free from smoky chimneys on these occasions.

As the weather is affected not only by the heatness and coldness of the air, which is measured by the thermometer; and by the quantity or weight of the atmosphere, which is measured by the barometer; but also by its density, which depends both on its temperature and weight; in order to predict its changes with any tolerable degree of certainty, an instrument is wanted to measure the density of the air at any place. The manometer was invented for this purpose: Lord Mulgrave, in his voyage of discoveries towards the pole, made use of such an
In instrument, on which he bestows some high encomiums, as by means of it and the barometer together, he could foretell the changes in the weather with great certainty, though one alone was not to be relied on.

The present theory of meteorology, though by much the best, seems yet incomplete, or however not extensive enough to account for all the various phenomena and changes observable in the atmosphere. Though the sun by its heat is able to rarefy the air, and consequently to cause a wind towards that place, where there is a partial rarefaction, which may in a few cases, account for the rising or falling of the barometer; yet how often do we perceive great alterations in this instrument, without any apparent wind whatever? Perhaps it may be said, that there may be brisk gales in the higher regions of the atmosphere, though all is apparently clear, calm, and serene, and we are quite still beneath. If this be the case, which can hardly be probable, how shall we be able to account for the sudden whirlwinds, waterspouts, * tornadoes, and hurricanes, that frequently happen, from the uniform and gradual alteration made by the sun's influence? In the three great oceans within thirty degrees of the Equator, particularly in the Pacific, the winds are

* A waterspout is caused by a whirlwind on the sea: The air having acquired a circular motion, by some sudden partial rarefaction in the higher parts of the atmosphere, is able by its centrifugal force to counterbalance the pressure inward of the whole atmosphere, and the water will, of consequence rise out of the sea up the vacuum made by this whirlwind, as it does in a pump, but never higher than thirty or thirty three feet.
are always uniform and regular, and the barometer at the same height. The variations in the weather, and the height of the barometer are much more extensive at or near land, than on the wide ocean; and in the northern regions, than near the equator, excepting when there are hurricanes: One cause may be, that the waters conduct heat or cold more readily than land. Yet I think it has never been sufficiently examined, how far air may be absorbed or dissolved in water, or converted into vegetables or other terrene substances, and the converse; as also how far these transitions are gradual, or sudden, depending perhaps on the accumulation or exhalation of electric fire, which is sometimes slow and uniform, and at other times almost instantaneous. All vegetables undoubtedly contain a vast quantity of fixed air, as do also all calcareous stones and earths. This air escapes out of one by fire or by solution in acids, and out of the other by corruption and putrefaction. Some causes however similar to these, by which air is converted into earth or water, or water and earth into air, seem requisite to solve many phenomena, which no other principle, as yet adopted in philosophy, can pretend to, particularly the sun's influence in rarefying the air. The quantity of air however contained in the whole atmosphere seems still to remain nearly the same, or the variations in its magnitude to be within narrow limits; though we have not had observations, which we can rely on for the purpose, of any very great antiquity. As any advancement in this branch of natural knowledge would be of the greatest advantage to mankind, it may be some apology for dwell-
ing so long on this subject,—for pointing out the few improvements that have been made,—the difficulties which the subject still labours under,—and for suggesting some hints, which may induce curious and ingenious men to extend their observations and researches into so useful a branch of natural philosophy.

Before I take my leave, some apology should be made for troubling you with my philosophical speculations on my summer's tour. The amusement from travelling is very languid and transitory, when it is pursued only for pleasing the eye: Recreation of this sort will produce a more sincere and lasting pleasure, if we are at the same time able to improve the understanding, to benefit society, and display the wisdom and goodness of the creator, by an investigation into the operations of his providence. How far I am right in my observations and conjectures on the several parts of natural history I have touched on, I leave to your own opinion. It would argue great self-sufficiency to be positive on a subject, where our data are uncertain, and every manner of reasoning doubtful, except where we can introduce the mathematics. This I think I may say without presumption, that my theory is conformable to events, as related by M0Re; and my reasoning agreeable to the philosophical principles of Sir Isaac Newton, where they could be introduced. Whatever is published to the world on the natural history of the surface and interior parts of the earth, that is inconsistent with either of their doctrines, will be of no benefit to mankind, and of short duration itself. When productions of the last sort make
make their appearance in public, like meteors in the sky, for a little while they puzzle the learned, and make the ignorant wonder, but they soon disappear, nobody knowing from whence they came, nor enquiring what is become of them. But these two prodigies of the human race, like the great luminaries of heaven, by their wisdom and knowledge, dispense an uniform, regular, and beneficial light to mankind.

I am, Sir,

Your most obliged

and humble Servant

J. H.

P. S.

I have sent for your entertainment, a curious group of old and original words, which were brought together with some attention and trouble. They are all now alive and conversant in the districts we have visited, and perhaps might give some useful hints to our commentators on Shakespeare, Spencer, Chaucer, and other ancient British authors. Some centuries ago, they might be in vogue in the metropolis, or perhaps at court: Though they are now banished for the sake of others more polite; yet they still find a sanctuary in the north of England; where they keep up much conversation, and transact a great deal of business. I have omitted, as much as I could, inserting all common words, which are altered only by pronunciation, according to the
The different dialects, that vary almost in every parish; for there would be no end of such a plan. I have not attempted to derive any of them, though there is ample room for the speculation of an antiquary and linguist; as that would make me deviate from my original rule, of conciseness. They are many of them of Greek, British, Saxon, Danish, and Norman extraction. I have endeavoured to give as short an explanation of them as the subject would admit of. Some words are very expressive and emphatical, and yet so concise, that they cannot be explained without a paraphrase; no other single words in the English language being proper substitutes. Their etymologies being uncertain, I have spelt by the pronunciation, which sometimes I have varied, according to the different dialects. As the industrious bee can extract sweets from the most rank weeds, so here the curious and studious enquirer may reap something worth his labour, whether amusement, knowledge, profit, or doing good to others be his object. Obscure passages in ancient authors, as was before observed, may be explained by them. Strangers may converse intelligibly with the natives of those places they visit for amusement or business: Were the gentlemen in the higher departments of the law to apply a little of their study this way, they might be better enabled to investigate the truth from the evidences they examine; not to say, less apt to mistake the true meaning of the accounts given them. The antiquary may see the several alterations the same word has undergone, and sometimes receive hints by which he may trace it up to its origin. People who have
gone out of these parts to the metropolis, or other distant places, may not only be amufed with their original language, and converse familiarly with their countrymen; but be taught amongst strangers to avoid their provincial words, as well as accent; for it is often a series of years before persons, arrived at maturity, avoid their old familiar words; never distinguisishing their peculiarity, except they have a catalogue of them.

### A GLOSSARY

**OF OLD AND ORIGINAL WORDS**

**NOW USED IN THE NORTH OF ENGLAND.**

#### ABBREVIATIONS.

- *w.* signifies verb; *s.* substantive; *a.* adjective; *p.* participle; *adv.* adverb.

#### A.

<table>
<thead>
<tr>
<th><strong>ACCOR TH-EARTH</strong>, s.</th>
<th><strong>Bair</strong>, a. near, or willing and officious</th>
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<tbody>
<tr>
<td>green, arable earth</td>
<td>Bang, v. to beat, or overcome</td>
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<tr>
<td><em>Ack</em>, v. to mind or regard; as never ack, never regard</td>
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<tr>
<td>Addele, v. to earn</td>
<td><strong>Barf</strong>, f. a child</td>
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<td>Amacka, adv. a little so Amants, adv. in case of</td>
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<tr>
<td>Ang, s. the hairy ear of bar ley, big, or rye</td>
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<td>Arrals, s. pimples, or a rash breaking out on the skin</td>
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<td>Arrows, s. a dole of ale and bread given at a funeral</td>
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<tr>
<td>Arr, s. a mark or fear on the skin from a wound</td>
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<tr>
<td>Attercosb, or Attercop, s. a spider</td>
<td></td>
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<tr>
<td><strong>Aund</strong>, p. doomed, or fated</td>
<td></td>
</tr>
</tbody>
</table>

#### B.

| **Bais**, f. the fish perch |
| **Beat**, v. to soften wood and sticks in the fire for use without burning them |
| **Beck**, s. a brook or small river |
| **Befow**, f. a broom |
| **Beat**, v. to make or feed a fire |

---

*Beef*
Beef, n. the milk given immediately after a cow has calved
Belf, s. shelter
Belote, adv. shortly
Bex, n. the space a person runs in order to leap
Big, n. a species of barley
Bib, v. to guzzle and drink
Blaf, or Splaf, v. to throw water, or befatter with water
Blak, n. a lead colour
Bebberous, a. all a cock-a-hoop
Beggart, n. a bugbear
Beggare, v. to startle or take fright at
Boniflower, n. a dazie
Boote, n. a full for a cow or horse
Booit, v. to signify or matter, as, it beates not, it matters not
Borrest, or burrest, n. an elder tree
Brown, or Beau, p. going to do a thing
Bracken, n. ferns
Braid, v. to reach and vomit
Brass, n. a very new Brandonth, n. an iron frame on which is set the girdlestones
Braat or brant, a. steep
Braff, v. to do anything hastily or rashly
Braut, n. a coarse apron
Bratches, n. an uncoward child
Breast, v. to sweat
To bread of, to be like unto
Break, n. a badger
Brogs, n. small sticks
Brown-leaming, n. a brown hazel-int
Brofro, n. a burnt
Bunnet, n. the stalk of hemp after it is taken off
Ball-fog, n. a bull that is gelded
Buffs, n. a bull
Byspel, n. a bastard, or an outcast in a family

C.
Caddle, v. to attend officiously
Caddie, n. a ghost, or bugbear
Callet, n. a scold
Callerd, n. an hard stone
Cassy, n. cheerful and talkative
Cakred, a. bound with iron as are clog-shoes
Camp, v. to scold, or talk impertinently
Cap, v. to puzzle
Cammaliman, n. the cupboards round the chimney in the north, where they preserve their dried beef and provisions
Chamberley, n. old urine
Chats, n. small sticks
Chigg, v. to chew
Childermas-day, n. innocents-day
Clam, v. to pine to death for want of water
Claim, v. to claim up, to pisse up, as an advertisement
Clake, v. to scratch
Claw, v. to daub
Clever, v. to climb
Claytin, n. a young chicken
Mg
Clog
Leg, s. an horse fly
Click, v. to snatch sudde-ly
Clints, s. crevices amongst bare limestone rocks
Clad, v. to throw mantle, &c.
Clay, s. shoes with wooden soles
Cobbles, s. stone stones
Cobby, in good spirits
Coggles, or cockers, s. a sort of yarrow spatterdashes
Cheat, s. the heart or pit of wood, bones, &c.
Cock, v. to be unsteady and easily shaken down
Canny, or canny, s. pretty, or bunny
Can, s. a squirrel
Cannocks, s. the kidneys of a beast
Cerab, or crow, s. cold
Corf, s. a wicker basket to wind up coals from the pit
Cer-tred, p. entangled, cotted
Coup, s. a dung cart
Coup, v. to exchange
Cove, or cower, s. a deep pit, cavern, or cave
Cower, v. to sit squat down
Craw, or crawl, v. to rake to-gether
Cra-ptu, s. a wild pigeon
Crummage, s. a levver, or crow
Coppy, scold, s. a foolscap
Cop, s. convex
Cop, a. without horns
Cord, s. also signifies frighted, dazed
Crose, v. to boast of, also to forbid and threaten
Crawc, v. to chew hastily
Creak, v. to make a rough and squeaking noise
Creak, v. to make a noise like a bull
Crewels, s. the meazles
Crevice, v. to recede, or fall off from a promise or purpose
Cringe, cringle, adv. zig zag
Crab-over, v. to be overbearing, tyrannical
Cuddle, v. to cuddle
Can't thanks, v. to give thanks
Cutter, s. to whisper

D.

Dab, s. an expert or dextrous person
Dainty, s. sharpness, delicacy, neatness
Daker, s. a dispute or argumentative conversation
Daly, or wildly, a. lonely, solitary
Danger, s. a bad person
That-at-da-nat, the devil
To dare for bett's, to hearken silently which side the opinion is of
Dare, v. to annul, mitigate, or relieve
Daz'd, a. of a dun colour
Deck, v. to discard
Dent, v. to dress and make clean
Dift, a. pretty, agreeable
Leg, v. to sprinkle with water
Dol, s. a little dale
Dicker, v. to shake or quake
Ding, v. to kick or strike
Dabbly, s. a sprite or apparition
Dockens, s. a. docks
Dolt, s. a. without horns
Dershit, s. hardship
THE CAVES.

Bree, v. to hold out without being tired
Bree, a. tiresome and tedious
Dew, l. a puddle
Dobha, l. a large dish or plate

N.
Na, l. a river along the sands on the sea shore
Earl, f. earnest money
Nahsies, f. caves
Edgewem, f. edge tools
Eem, l. eyes
Eden, f. jewel
Elder, l. udder

F.
Fargang, f. a gang of beggars or rogues
Faffle, caffle, and maffle, v. to be inconsistent in speech
Fare, v. to ache
Farnetkles, f. freckles
Fasb, l. labour, hardship
Fague, f. a dirty filthy, vile person
Fleshewtom, f. shrotveste
Fetl, l. to hide
Fect, v. to walk about in perplexity
Fell, l. a mountain
Fene, v. to fare, as how fend you, how fare you
Fet, v. to let off any work
Fettle, v. to fix about doing any thing
Fling, f. rubbish earth cut up and thrown aside in order to get turf
Fidge, v. to kick with the feet
Flen, a. Gallow

Flush, v. to flatter
Flaw, l. top?s for fire
Fley, v. to straight
Fleet, v. to find the top of any thing, as cream
Flight, v. to float
Floow, a. wild, untractable
Flourish, f. blossom
Flowt'd, p. blunt and jagged at the point
Fluring, a brood
Flustered, p. swell'd or bloated
Fond, a. silly, stupid like an idiot
Fondling, f. an idiot
Foater, f. a stroke at a foot ball
Formal, v. to bespeak or engage any thing
Fosh, a. cunning, crafty
Fous, f. a pet, a spoiled child
Famen, f. substanital goodness
Fandish, a. passionate, obdinate
Frasche, v. touffle, or cheat in joke
Fridge, v. to rub in pieces
Ref, f. a fig
Ref, a brittle
Frow, f. an idle, dirty woman
Froom, or frum, a brittle

G.
Gabblecatchae, f. birds which make a noise in the air in the spring evenings
Gaiffat, f. a tub or vat in which drink ferments
Gallow, f. plenty
Gallowage, f. a small nag or hobby
Gelb
Galy, a. in good plight as to health and spirits
Gamashtes, and gamginas, f. a sort of spatterdashes
Gapen, f. as much as can be held in both hands when open together
Gar, v. to oblige or compel a person to do a thing
Garn, f. yarn
Gavslack, f. an iron crow
Gain, v. to be benumbed with cold
Geb, v. to hold up the eyes and face
Gib, f. an hooked stick
Gite, or jike, v. to creak as wheels or doors do
Gill, f. a large deep channel for a small brook
Gimmer-lamb, f. an ewe-lamb
Gimnri, f. the gills of a fish
Girt, v. to grin with the teeth
Gisfe, v. to glitter or shine
Gisle, or jisle, v. to walk mincingly
Glad, f. a kite
Glen, or gladden, f. a glade
Glint, v. to look askew
Glender, v. to look with twinkling eyes
Gliff, f. a transient light.
Gloar, v. to glare with fixed eyes
Gloos, v. to squint
Gloppen, v. to startle
Goats, f. stones to step over a river on
Geb, f. the mouth
Goff, f. a foolish clown
Gume, v. to see, perceive, or understand

Goggy, f. a child's name for an egg
Gopher, v. to bully
Gook, f. a fool
Goot, v. to weep or cry
Groat-stones, f. a sort of free-stones
Graisley, a well-meaning, or any thing good in its kind
Grike, f. a rut, crevice, or chink
Grime, f. lint or smut
Growsome, a. ugly, disagreeable
Grow, or grew, v. to be a-guith

H.
Hacklawer, f. a floven
Haffle, v. to prevaricate
Hagworm, f. a viper snake
Haver-meal, f. oat-meal
Hairing, p. idle, lounging
Halab, a. modest, bashful, squeamish
Hankle, v. to entangle
Harp against a person, v. to intimate to his disadvantage
Haupin, f. an hunx
Haf, a. cold and dry
Hap, v. to tuck in the bed cloths
Hastock, f. a flock of corn
To haul to, v. to rely on; also to heald a vessel, to incline it in order to empty it
Heams, f. part of a cart-horse's neck furniture
Hearse, f. the place on which a particular flock of sheep feeds on a common

Hades,
The Caves

Harden, or heiden, a ugly, obstinate, untoward
Hick, f. a small door, or half door
Hewing, f. a furrow
Hobblestrae, f. the hand rail on a foot bridge
Hig, f. dishgust, ennui
Hippenstones, f. stones set to step on over a river
Hirse, f. a bank or sudden rising of the ground
Hiss, v. to breath short through cold or pain
Hipple, v. to limp in walking
Hobbold, f. a foolish clown
Hobgoblin, f. an hobgoblin, called sometimes Robin good-fellow
Hog, f. a sheep of a year old
Hog, v. to carry on the back
Holme, f. the lowlands near a river
Hoppled, p. having the feet or legs tied together so as only to walk by short steps
Horse, or burse, f. a deep vale between two mountains
Host, f. a sort of panniers to carry turf or slaic in
Houfe, f. the buks of oats
Hudder, f. an heap of stones
Hurtle, v. to shudder
Hull, f. a place to put in calves or swine
Huller, f. an owl
Hump, v. to throw any thing as a stone
Hummer, v. to make a low rumbling noise
Hutch, f. an hord
Hussel, f. an hunk, or covetous person

Hussin, f. an hulk

Item, f. an hint
Inling, f. an hint
Ingle, f. fire

J.
Jannack, f. a loaf of leavened oat-meal
Jerbied, p. drugged
Jenny-balk, f. a small beam near the roof of the house
Joggle, v. to shake gently
Jor, v. to joltle or push
Jony-crome, f. a crane
Jottel, f. an hodge podge
Jump, v. to shake up or toss to and fro

K.
Kaffe, v. to perplex a person or entangle him in conversation
Kail, v. to pelte
Kay, or Kai, f. cow
Keep, v. to catch
Ked, f. a sheeps loufe
Keik, or keik, v. to strain or taint
Keal, or kail, f. broth
Kell, v. to keep the pot from boiling over
Kelle, f. a kick
Kcel, v. to sprawl or gambol
Kedge, f. a mischievous child
Kenspace, a. marked so as to be known again
Ker, f. carrion
Keslop, f. a calves stomach, sometimes called rameat
Kirk-garth, f. church-yard

Kins.
A TOUR TO

Kinn, f. chinks and crevices in rocks, or breaks in the skin of the human body
Kite, f. the belly
Kift, f. a chest
Kittle, v. to tickle
Kirtle, v. to flout and give airs
Kip, v. to intonate to the disadvantage of a person
Knaig, knat: and knarl, v. to grow with the teeth
Know, f. a rocky mountain
Know, v. to toll a bell
Knob, f. the sharp rise of a hill
Knack, v. to aim at talking with fine words
Knudge, v. to kick with the elbow
Knoll, or knath, f. a frame to lay a sheep on
Kyspy, a. squeamish

L.

Lam, v. to beat or strike
Lairly, f. a disagreeable person
Lame, v. to play
Lanced, p. having the legs coupled together at small distance
Langettle, f. a bench like a fettled
Late, v. to seek
Least, f. a stythe
Leavesail, a. being a great want of, or demand for
Leath, f. barn
Lively, a. alert, active
Lurch, v. to sharp, or trick out of
Lay, v. to fold up

Like, v. wanting to do a thing; as like to make water
Lids, way or manner, as thus, lids, and that-lens, in this manner, or that manner
Lick, v. to beat or drub
Lill, a. little
Lim, f. flax
Ling, f. heath or heather
Lisp, a. flout and active
Lis, or lip, f. the flank
List, v. to expel or depend on
Listen, v. to listen
Lither, a. idle inactive
Loose, f. the first offer
Lout, f. a small parcel of any thing
Loppered, a. cruddled
Loud, v. to weed
Lows, f. a flame
Loud, a. calm or out of the wind
Lum, f. a deep pool.
Lyring and larch, f. a gutter waited by the tide on the sea shore

M.

Mad, a. angry, provoked
Mark, f. fort
Madule, v. to rave, or to be delirious
Maffin, f. one almost an idiot
Maffle, v. to talk or act sillily or incoherently
Mannered, f. a simpleton
Maunder, v. to wander as if bewildered
Mophat, f. a load of bread
Mortar, f. a mortar or equal
Mound, f. a basket
Mew, a. meager or mellow
Measuring, or Measure, f. one who has not much sense
Meltin, f. flaggs, or bulrushes
Mell, f. a mallet, or large wooden hammer
Mead-fruit, f. a landmark, or boundary stone
Melder, f. oat-meal when first ground, with all the dust and seeds together
Meadow-wax, f. quicklands
Meat, f. manner, particularly in domestic economy
Merk, f. dark
Meticulously, adv. pretty well, not amiss
Mistle, a. much
Midden, f. dunghill
Midge, f. a small fly
Mife, f. a misadventure
Minder, p. overcome with care, exercise, or labour
Minnen, v. to guess by the handful
Moundwarp, c. a mole
Mush, c. dung, mire, manure
Mould, f. dust or small crumbs broken off from turf or peats
Mum, f. the mouth
Munge, v. to chew
Mum-chance, f. a person who sits silent and attentive
Mint, v. to hint by signs
Mire, f. the same as rainy
Muff, v. to crush, or crumble

N.

Naggin, f. the same as mafflin
Nag, a. tender, brittle

Nafe, f. the clinched fist
Nean, f. uncle
Neb, f. bill or mouth
Ner, adv. than
Nesp, f. to pick off the ends of gooseberries
Nemtled, p. a little drunk or intoxicated
Nigle, v. to steal articles of a small value
Nigler, f. one who is clever and dexterous
Nip, v. to pinch with the fingers or nails
Nobble, adv. only
Nep, f. a small blow or stroke
Nob, and Nudge, v. to give a person an hint or signal by a private touch with the hand, elbow, or foot

O.

Of, v. to offer, intend, design
Ope, f. an elf
Owen, f. out of doors
Owner, f. the shade

P.

Paddock, f. a toad
Pallower, f. noise and abuse
Pam, v. to fit or tally with
Parrock, v. a small field near a farm-house for calves, &c.
Pash, v. to throw down, break, and destroy
Pash, f. a sudden crash
Pais, f. to collude, plot, or contrive together
Pay, v. to beat or drub
Peat, f. turf for the fire
Paid, a. blind of one eye

Raif
Pelf, n. a bad, or good-for-nothing person
Peg-stick, n. a cat's tail
Pern, v. to over-run
Petticoat, v. to coax, play or toy with
Petticent, v. eazy odd turns done with little labour
Péta, n. diamonds or cards
Pieman, n. a magpie
Pigmen, n. a pri
Pikkle, n. a bun, or muffin
Plish-bash, n. a parasite, or hanger-on
Pill-gill, n. a rare-drop, or any intereat or public entertainment
Pippen, n. the seeds of an apple
Pleas, v. to tell tales against a person
Plify, v. to blister
Plad, n. a puddle
Peck-ard, a. pitted with the small-pox
Potter'd, p. strusted inconveniently for want of room, or any articles in use
Potrack, n. a beggarly person
Pose, n. a small stroke on the head, or elsewhere
Pout, n. a pimple
Pony, n. a filthy person
Prefef, n. choice, also invitation
Pro, f. food, provisions
Pread, v. to push with a stick
Prel, v. to look big, and of consequence
Proeu, v. to dig, or throw up mould
Punch, v. to kick or strike with the foot
Purdy, n. a short bread and fat person
Put, v. to push with the head and horns as a bull or ram
Putter, v. to whine and cry
Quok Kee, v. to vomit
Quack, v. to banter
Raddling, f. raving
Ratch, v. to tear in pieces
Rack-of-the weather, f. the track in which the clouds move
Rannie-bale, n. a piece of wood in a chimney, from which is hung the pot-crock, or sacken-crock
Raggabroth, f. an idle ragged person
Rallack, v. to romp
Rake, n. rat, crack, or crovice
Ratten, n. a rat
Ream, v. to reach with stretched out body and arms
Rem, n. a dale, or rig in a field
Reafed, p. tired
Ream, f. to blow off as wind does thatch
Reek, n. smoke
Reef, n. a raft
Reelig, v. to repair, or put in better order
Renable, a. loquacious, and never at a stop or inconstant in telling a story
Reech, v. to wash clean with water, as clothes, bottles, &c.
Reifs, v. to belch
Rhin,
<table>
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<th><strong>THE CAVES.</strong></th>
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<td><strong>Rhime,</strong> f. an hour frost</td>
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<td><strong>Riddle,</strong> f. a sieve</td>
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<td><strong>Rife,</strong> a. infectious and mortal</td>
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<td><strong>Ripple,</strong> v. to scratch</td>
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<tr>
<td><strong>Rake,</strong> f. fog, or mist</td>
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<td><strong>Rafled,</strong> p. half rotten as appies sometimes are</td>
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<td><strong>Rangb,</strong> v. to renounce at cards</td>
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<tr>
<td><strong>Rumpus,</strong> a. violent, bold, and rash</td>
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<tr>
<td><strong>Ranger,</strong> f. the steps in a ladder</td>
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<td><strong>Ruff-bearing,</strong> f. a ceremony of carrying garlands or rushes to the church</td>
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<td><strong>Rubbing,</strong> f. a beaver, baits, or rearupper</td>
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<tr>
<td><strong>Stramb,</strong> or <strong>frame,</strong> v. to pull or take together with the hands</td>
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<td><strong>Sregg,</strong> f. shrubs, or brushwood</td>
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<td><strong>Scraff,</strong> f. the nape of the neck</td>
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<td><strong>Scum,</strong> v. to throw a stone</td>
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<td><strong>Screre,</strong> f. cloth worn till it is thread bare</td>
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<td><strong>Seigh,</strong> v. to fag</td>
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<tr>
<td><strong>Shaffle,</strong> and <strong>Sheill,</strong> v. to hobble in walking, also to act unfairly</td>
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<tr>
<td><strong>Shosim,</strong> f. an idle shuffling person</td>
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<td><strong>Shug,</strong> f. a piece of bread or cheese</td>
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<td><strong>Shear,</strong> v. to reap</td>
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<td><strong>Sheering,</strong> f. a sheep a year old, or once born</td>
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<tr>
<td><strong>Sher,</strong> f. a slice</td>
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<tr>
<td><strong>Shippen,</strong> or <strong>shappen,</strong> f. a cowhouse</td>
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<tr>
<td><strong>Shirl,</strong> v. to slide on the ice</td>
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<tr>
<td><strong>Shoup,</strong> f. an hep</td>
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<tr>
<td><strong>Shid,</strong> a. long, as garments are when too big</td>
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<tr>
<td><strong>Sand,</strong> v. rince</td>
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<tr>
<td><strong>Sidle,</strong> v. to faunter</td>
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<tr>
<td><strong>Summer,</strong> v. to make a noise as water does before it boils</td>
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<td><strong>Sipple,</strong> v. to sipple</td>
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<tr>
<td><strong>Sink,</strong> v. to give over milking a cow before the calves</td>
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<tr>
<td><strong>Skale,</strong> or <strong>skail,</strong> v. to scatter or throw abroad, as molehills are when leveled</td>
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<tr>
<td><strong>Skatlash,</strong> f. a shelf or ledge</td>
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<tr>
<td><strong>Skiboepeak,</strong> f. a cow-stall</td>
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<tr>
<td><strong>Skirr,</strong> v. to squint</td>
</tr>
<tr>
<td><strong>Skirl,</strong> v. to scream out, or shriek</td>
</tr>
</tbody>
</table>

| **Shirl,** |
Skein, or forte, f. small lines or pebbles
Skare, or shair, a. wild, timid, shy
Sist, v. to reflect on
Sleek, v. to quench
Slapper, f. any thing large and rude
Slap, or shape, a. smooth and slippery
Slack, a. a dell or glade
Slash, v. to cut in gashes
Slitter, v. to spill carefully
Slink, v. to go over rainy
Slack, or soak, v. to quench
Sling, v. to hunt privately for stealing food as dogs do
Slip, v. to strip off the skin or bark of any thing
Slue, v. to split
Sling, f. a slovenly clown
Slow-worm, f. a snake
Slaun, or slawn, f. a gentle sleep, or slumber
Smithe, a. infectious
Smudge, f. a suffocating smoke
Snaggy, a. tetchy, peevish
Snipe, v. to gain-fay, discourag, or call off
Snazar, v. clip an hedge
Snipits, v. to thrivell up by means of fire
Sneck, f. a door latch
Short, f. an ineffectual effort to stifle a laugh
Sneer, v. to turn up the nose
Swig, an eel
Soig, v. to drag wood without a cart
Soed, a. smooth
Snocken, a. entangled, or disorderd
Snote-yob, f. the red part of a turkey's head
Snutter, to sob or cry
Snowbound, f. the iron round clog folks
Snuggie, v. to hide the face in the bosom as children
Sot, v. to lap as a dog does
Soup, or stuff, f. a covered drain
Sort, v. to make a noise in boiling as any thick substance does
Sprang-new, a. very new
Sprang-throw, v. to throw up into the air
Spain, or spian, v. to weak
Speal, f. chips, or small split sticks
Spraved, p. gelded, barren
Spokes, f. small sticks to fix on thatch with
Spie-and-knor, f. the game of trapstick
Spool, f. the thread in a weaver's shuttle
Sprint, f. a gin for catching birds with
Spread, v. to spurn and kick with both hands and feet when held down
Squelch, f. a flat fall-on one's hide
Stalange, v. to compound for by the year or number
Stangs, f. the shafts of a cart
Stag, f. a colt, or fell, and also a romping girl
Start, f. an handle
Stainch, f. a root like liquorice
Staforber, f. frog spawn
Steak, v. to pull to, as a door or gate
Stee, f. a ladder
Stew, f. when the air is full of dust, smoke, or steam
Stitch'd
THE CAVES.

Stitch'd, p. ill'd very fall
Stirk, f. fler
Stidden, p. flood
Stead, p. tired, weary
Storkin, v. to congeal, or congeal like melted wax or tallow
Stater, or stotse, v. to stumble
Steep, f. a poat
Steak, v. to raise a stream
Stuck, f. a shock of corn of ten sheaves
Stowr, f. an hedge flake
Strachlit, f. one who is distracted
Strickle, f. an instrument to whet sythes with
Stumbl, f. one who is broad and stout though short
Stirring, f. the last part of a cows milk
Stubs, f. the stumps of trees
Stab, f. to dig up trees by the roots
Stew, v. to stammer
Summgering, f. a rash-bearing, also a riot or scolding match
Stuck, f. when the air in a house is filled with steam and smoke
Swarmle, v. to climb a tree that has no boogis
Sensuous, f. bafhral of sheepish
Sway, v. to walk proudly
Swold, or sowal, f. a flame
Swarth, f. a man's appari- tion, or likeness
Swake, v. to exchange
Swill, f. a bull or wille
Swad, f. a pod of peas or beans
$watch, f. a fished, remnants, or a piece clipped out of a cloth
Swatch, v. to cut or clip
Swat, v. to sit down; also to scatter or spill any liquid
Swatch v. to guzzle
Swish, v. to play at see saw
Swig, f. a liquor made of whey and herbs
Swig, v. to drink heartily
Syr, or sy, f. a drop
Syr, f. a frame of straw to let pass on
Syre, v. to trickle or come drop by drop
Syls, f. a small rivulet

Y.

Yang, f. a pike, also a sting
Yare, f. a pool or small lake
Yemouth, f. an idle knavish person
Yonke, or toffel, f. a wicked drunken person
Yea, the one; as ten hand, the one hand
Yea, adv. overmuch
Yea, v. to kick with the feet
Yea, v. to pour out
Yea, v. to watch or guard from doing a thing
Yea, f. these
Yea, v. to pada
Yor, f. anger, passion, headstrong resolution
Yor, and yern, a unwilling
Yop, v. to hold a false argument
Yore, f. 24 sheaves
Yor, v. to push
Yopple, f. the throat, or rather the windpipe
Yrody, a. fat or filthy
Yrrow.
Tour—

Touraite, f. the shelving part of the side of a mountain
Tike, s. an old queer fellow
Tidy, a small
Time, v. to tuss with the hand
Time, v. to entangle
Tit, s. an horse or more
Time, v. to put to a door
Tir, v. to turn over as leaves in a book
Tistor, a. first, or foremost
Thrummle, v. to tumble
Ted, v. to tooth sickles
Tame, v. to faint away
Tome, f. a fishing line
Torse, v. to decline in health
Tisner, v. to stagger
Tourpin, s. a pin belonging to a cart
Trail, v. to drag after
Trig, v. to fill, particularly the belly
Tap, tap, or tap, s. a ram
Tate, s. to be on the twitters, to be in great doubt
Tweat, s. a beait of two winters old

U.

Uccloth, a. strange
Urchin, f. an hedgehog
Urly, v. to look sickly, or to go back in health

V.

Vallidium, s. value of
Vempys, v. to vapour or swagger

W.

Walk, s. a wallow, insipid
Wanke, a. weak
Wark, f. a swelling on the back of a cow or ox
War, a worfe
Ward, s. world
Warday, s. workday
Wark, v. to acho
Warrior, f. the bowels
Wax, v. to grow in stature
Wade, a. ferry for
Wærnt, v. know not
Wether, s. a gilded ram
Whating, s. old urine
Wet, and aemy, a. very small
Wife, v. to overlet
Whain, v. to coax or entice
Whamp, s. a waip
Whang, a. thong
Whate, v. to breathe hoarsely
Whem, a. gentle, easy
Whell, v. to kick or strike
Whim, and whominn, v. to turn any vessel upside down
Whant, a. strange
Whines, s. furrus, gos
Whinge, v. to moan and complain with crying
White, s. to cut sticks with a knife
Whit-sit, v. the deed take it
To lay wobite on, to lay the blame on
Whither, v. to quake or shake
Whitherer, s. a fally, strong, or stout, person or thing
Whrine, s. any thing very tour
Why, s. a young heifer
Windle, or wintle, s. a bushel
Windlaw, s. thrown on one side
Wig, s. a bun, or muffin
Wilk, s. a swill or scuttle
Whisty, a round hoop of oyster

Witterings
THE CAVES.

Wittering, n. an hint
With age
To turn against a person, to infininate to his disadvantage
Wreeken'd, a. shrivelled up
Wrecken, f. the least animal in a brood or litter
Wye, adv. yes

A TABLE
A TOUR TO

A TABLE OF THE ROADS,
AND DISTANCES OF PLACES FROM EACH OTHER.

Miles.

Kendal, 13 Kirkby-Lonsdale.
6 Thornton-church-stile, 4 Yordas-cave.
4 Ingleton, 4 Chapel in the dale.
3 To the top of Ingleborough
3 Back again to Chapel in the dale.
4 By Gatekirk, WIntercales, and Greenside, to the top of Whenside.

3½ Gearstones.
2 Alan-pot
4 Horton.
6 Settle.
5 Malham-cave.
5 Kilsey-crag.
3 Grassington.
9 Skipton.
9 Keighley.
4 Bingley.
6 Bradford.
7 Kirkstall-abbey.
3 Leeds.

FINIS.