A Sketch of the Mineralogy of Shropshire

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Notwithstanding the advantage to science, public economy, and private interest, which would result from such an undertaking, I am afraid there is but little probability of a mineralogical survey of this kingdom being made for many years: till then we must be thankful for partial accounts and sketches of districts.

The following sketch of the mineralogy of Shropshire is the result of several little excursions made at very different times; sometimes, in true style, on foot, with hammer in hand, other times on horseback. This will explain why sometimes I am minute and enter into detail, and why I sometimes merely sketch. It is by no means given to the public as a mineralogical survey.

The county of Shropshire admits of a natural division into two parts; the flat and the hilly; and these are pretty accurately marked by the course of the Severn. Through all the, northern part of the county, from the Severn at Shrewsbury to the confines of Cheshire in the north ; and from Drayton on the borders of Staffordshire on the east, to Oswestry on the borders of Wales in the west, it is flat; varied only by gentle swells, and here and there some naked rocks. But on the southern side of the Severn, from near Shrewsbury to Ludlow on the borders of Hereford on the south, and from Bridgnorth on the borders of Staffordshire on the east, to Bishop's Castle on the borders of Montgomery on the west; the country is very hilly. Yet, to be more accurate, it must be observed that the hilly district, on the eastern side of the county, begins just on the north side of the Severn where the Wrekin rises from the plain.

Throughout the flat district, common sandstone prevails, and forms in some places considerable rocks, as at Grinsell, Nescliff and Hawkeston. Both red and white are common, and both are used in building; neither has a calcareous cement. The gentle swells that prevail in this district consist chiefly of gravel, composed of different kinds of hard siliceous sandstones, compound sandstone, and quartz. The nature of the gravel varies, I suppose, according to the proximity of different rocks.

At Llanymynych, near the confines of Montgomeryshire, a range of limestone rocks begins, which is in some parts of considerable height. The strata rise towards the Welch mountains, and vary a little in texture and colour. Many deep excavations on the top of the highest hill indicate that mines have been worked here in some, probably, very remote period. Calamine, lead, and copper, are still got, but in small quantities. Here I found amongst the rubbish from the mines a piece of madrepore in the state of limestone; on breaking it I found the sides covered with a thin coating of galena lead ore.

At Oswestry the country rises towards the north west, and the hill called the Cerny-Buch is a coarse grained sandstone, very different from that found in the flat country. This leans upon limestone, which, at a quarry belonging to Mr. Lloyd of Aston, forms a bold precipitous range of rocks that face the Welch hills in the N. W. and seem to extend to a considerable distance. This limestone contains many petrifactions and a great quantity of black flint approaching to chert; it is not like the flint distinct from the

rock and in polymorphous nodules, but in small irregular masses, insensibly uniting with the limestone. Two or three miles S. W. of Oswestry are the collieries of Llwyny main and some others; they seem to rest upon the lately mentioned coarse sandstone strata. The argillaceous and sandstone strata which accompany the coal are very rich in vegetable impressions. In the colliery of Llwynymain I found a very curious, and I may, I believe, say, a new species of ironstone. It has the brown colour and the weight of the common argillaceous ironstone, but has a very rough uneven fracture, a coarse granular texture, and glitters with innumerable specks, as though it contained minute spangles of mica. After a close investigation with a lens and nitrous acid, I ascertained it to be a mixture of spatous iron ore and the common argillaceous ironstone. The spatous ore, which is in small grains not bigger than a pin's head, and apparently spherical, with eccentric or divergent rays, seems to be nearly equal in quantity to the common ironstone, which may be considered as the ground or cementing matter. I knew not when I was on the spot what it was, otherwise I should have examined into its situation and circumstances more particularly. It seems to exist in great masses, and likewise in nodules, like the common ironstone. As the best iron and steel, those of Styria, are made of spatous iron ore, this may, I think, be round a valuable ore.

Near the Severn, and two or three miles N. E. of Shrewsbury, is Haughman-Hill. This is of compound sandstone, and the strata where I observed them were vertical. About ten miles east of Shrewsbury, the Wrekin, the most celebrated hill in the county, rises from the plain near the banks of the Severn it is a ridge hill, about two miles long, running nearly north east and south west. The land is considerably higher on its eastern side, as the country here begins to rise into hills. About three years ago I ascended this hill. It is chiefly composed of a reddish coloured chert, which in some parts has the spotted and variegated appearance of Breccia. I recollect to have seen in one part a bed or an immense mass of hard close grained siliceous sandstone. In another part wackế or basalt is found, and in another a granitoid rock, composed almost wholly of small grained red feldspar, with a little quartz and some minute specks of a greenish matter, probably of the nature of hornblende. This hill, or mountain, as it may be called, belongs to the primative. It has no regular stratification, is without any mineral veins, and produces nothing valuable. To the N. E. of the Wrekin lie the Arcall Hills. That nearest the Wrekin is chiefly composed of the hard close grained siliceous sandstone, with some wackế or basalt. The other appears, from a quarry that is opened, to be chiefly of chert, yet the siliceous sandstone is found likewise here, and some of it has been used in a pottery at Coalport, in this district. Wackế or basalt is again seen here. The quarry of chert is covered by a bed of a very singular kind of red gravel about four or five feet thick, composed of small fragments and the small debris or sand of the granitoid rock. To the east of these hills lies the Steeraway Hill. This is formed of limestone strata, sandstone strata, and clay strata; they dip to the east, and near these hills with an angle of about 45 degrees, but fall flatter more to the east. Though the Wrekin is very unproductive, it is at the foot of this hill that the greatest mineral wealth of the county is deposited.

The Coal district of Coalbrook Dale lies on the east side of the Wrekin, runs parallel with it from the N. E. to the S. W. and is about eight miles long and two broad. This account of the coal district was communicated by Mr. William Reynolds of Ketley. It is first observed on the other side of the Severn, in the parishes of Barrow and Much

Wenlock, and runs through those of Brosely, Madely, Little Wenlock, Wellington, Dawley, Malins Lea, Shifnall and Lilleshall. The whole, but especially the southern part of this coal district, is considerably above the level of the plain of Shropshire, so that near Horsehay it is 500 feet above the river Severn which flows in its neighbourhood. The dip of the strata varies; in the parish of Madeley it is towards the east, and near Wellington and Linsel it is from north to north east, about one yard in ten. The support or foundation of the coal, and its accompanying strata, is dye-earth and basalt. The former lies on the east side, and the latter on the west. The dye-earth is a grey dry clay, which effervesces with acids, and contains petrifactions chiefly of the Dudley-fossil kind, and some small bivalves. It is a stratified mass, and at Tickwood, in the neighbourhood of Coalbrook Dale, may be seen to be at least an hundred yards thick. The basalt varies from the softer and lighter kind, called wacké, to true basalt. In some places in the parishes of Brosely, Madeley, Little Wenlock, Wellington, and Lilleshall, limestone is found as the support of the coal strata. From a rough analysis made by a friend it appears to consist of about 58 of argil. 26 of cal, E. and 16 of silex.

At Wombridge, in the northern part of the coal district, the following strata are found. I must observe that this is in the western swamp or depression of the strata, for, on the elevated part, the first twenty strata are generally wanting.

1	Top Rock	27 feet.	It is an argillaceous yellowish sandstone.
2	White Clay	18	a blackish grey plastic clay.
3	Chance Coal	9 inch.	
4	White Tough	2 feet	a blackish grey plastic clay.
5	Ash Ball Rock	18	a heterogenous mixture of small fragments of greenish grey clay, of reddish chert and white quartz.
6	Rocky Marl	18	a reddish brown dry shivery clay
7	Gritty Rock	6 feet.	It is a white sandstone, but of so extremely fine a grain that it appears as a compact ungranulated mass
8	Rocky Marl	13	the same as N.5 but of much minuter parts, and mixed with some of the red clay of N.6
9	Gritty Rock	5	a fine grained grey sandstone, containing mica
10	Rocky Marl	9	a reddish brown clay and whitish clay mixed, nearly the same as N.6
11	Gritty Rock	4	a whitish sandstone

12	Ash Ball Measure	84	the same as N.8 but without the red clay
13	White Rock	3	a very find grained white sandstone
14	Rocky Marl	11	the same as N.8
15	Rock	2	a very fine sandstone like N.7
16	Tough Soft Clay	18 inch	a blackish grey plastic clay
17	Hard Rock	4 feet	a grey sandstone of so fine a grain as to appear compact to the naked eye and containing very minute particles of mica
18	Top Pinny Measure	8	beds and nodules of ironstone, in a blackish dry grey clay
19	Black Slums	18 inch	a greyish black slippery dry clay
20	Fungous Coal Rock	36 feet	a coarse grained whitish sandstone
21	Fungous Coal	3	an excellent coal
22	Fungous Coal Poundstone	4	a greyish black dry clay
23	Foot Coal	1	not got
24	Black Stone	4	a black grey ironstone in nodules, in a greyish black dry clay
25	Stone Coal	4	a good coal
26	Tough Poundstone	3	a black slippery dry clay
27	Gur Coal	2	not got
28	White Clunch	4	blackish grey dry clay
29	Gray Rock	4	a light grey fine grained sandstone
30	Brick Measure	16	alternating strata of grey coloured ironstone and dry clay
31	Bind Bass	6	a black dry clay
32	Bind	7	a brownish grey very fine grained argillaceous sandstone

33	Ball Stone	9	grey coloured ironstone in nodules, in dry clay. These nodules contain fern leaves and other vegetable impressions.
34	Dun Earth	6	ironstone nodules in a grey dry clay
35 .	Top Coal Bass	5	this is one of the best coals in Shropshire
36	Top Coal Poundstone	1	a greyish black dry slippery clay
38	Slums	4	a black slippery dry clay
39	Three-quarter Coal	1	never got
40	Double Coal Rock	6	a very fine grained whitish sandstone
41	Double Coal	6	a good coal much used
42	Double Coal Poundstone	18 inch	a greyish black dry clay
43	Yellow-stone Earth	6 feet	ironstone in short thick masses in a shivery blackish grey dry clay. This ironstone contains in its cavities blende and terra ponderosa vitrio
44	Yard Coal	3	sometimes got
45	Yard Coal Poundstone	9 inches	a black dry clay approaching the nature of a bass
46	Quoice Neck	9	greyish black dry clay, with very shining surfaces
47	Blue Flat	6 feet	alternating strata of brownish grey ironstone in dry clay, the ironstone in the upper part is in nodules
48	Pitcher Basses	5	a black bass or indurated schistose clay (shiefer Thon.) like N. 36
49	White Flat	4	alternating beds of ironstone in a black grey shivery dry clay
50	Flint Coal Rock	10 feet	a fine grained whitish sandstone with some mica

51	Flint Coal Roof	13	a blackish grey dry clay
52	Flint Coal	5	a good burning coal; at Madeley-wood it is impregnated with falt-water
53	Flint	21	a fine grained whitish sandstone used for building
54	Pinny Measure	24	a blackish grey dry clay containing iron nodules. It is in the upper part of this stratum, close under the flint, that the Curl is found
55	Stinking Coal	5	a coal containing a great deal of pyrites which are used for vitriol; this coal being cheap it is chiefly consumed in burning brick, lime &c
56	Stinking Coal Bass	18 inch	a greyish black dry clay
57	Upper Clunch Coal	10	a good coal, but being so thin it is not got, except where the coal above is worked open
58	Upper Clunch	3 feet	a light grey shivery dry clay, much used for firebricks
59	Clunch Coal	2	never got
60	Lower Clunch	6 feet	a grey dry clay used for fire-bricks
61	Two foot Coal	2	sometimes got
62	Linsed Earth	12	a dark black-grey dry clay, used for firebricks.
63	Best Coal	9 inch 2 feet	in the northern part in the southern, this is the best coal
64	Randle Coal	3 feet	the best smith’s coal
65	Bannack	2	a brownish grey very slippery dry clay, good for firebricks
66	Clod Coal	4	this is threw coal used for smelting all the Shropshire iron
67	Pale Blue Clod	4½	a bluish grey clay with vegetable impressions

68	Sandstone	9	a fine grained argillaceous sandstone, containing vegetable impressions
69	Little Flint Coal	2	a good burning coal
70	Little Flint	10-45	a very fine grained white sandstone.

Thus we have a mass of strata about 550 feet thick

The Little-flint is the lowest coal stratum, and then either the dye-earth, basalt or limestone is found. But this order of strata which is found at Wombridge in the north, does not continue through the whole coal district. At Broseley and Madeley, in the south, the following order of strata is found. Unfortunately, from the pits not having been lately sunk through the upper strata, but from a level or adit in the side of the hill, the upper strata here are not accurately known. So far however is known, that there is first an immense bed of red sandstone, then, for about a hundred yards, alternating strata of sandstone, argillaceous sandstone, strata, of clay, and thin strata of coal from one to four inches thick, then

a whitish Rock. An argillaceous Sandstone	21 feet
a small sulphurous Coal	8 inches
a bluish Clod. A dry Clay	14 feet
a small Coal	2 inches
a whitish Clay, containing Nodules of Ironstone	2 feet
a brownish Sandstone coloured by Petroleum	13
a bluish Clay, with vegetable impressions	5
a plastic Clay, with small Strata of Coal, one and two Inches thick	6
a Coal, called the Upper Stinking Coal	8 inches
a whitish dry Clay	1 foot
a bluish grey argillaceous Sandstone	13 feet
a brown ditto ditto	9
a reddish dry Clay, with a little Haematites	2½
a grey argillaceous Sandstone	7
a brown plastic Clay	2
a whitish dry Clay	5
a reddish dry Clay, with a little Haematites	6
a brown Sandstone	18
a fine reddish dry Clay	11 feet
a greyish fine grained argil. Sandstone	11
a dry Clay, including two small Strata of Coal, one fix, the other seven Inches	6
a Stinking Coal. Got	1½
a grey argillaceous Sandstone	11
a reddish argillaceous Sandstone	15
the upper Part of the rough Rock, which is a very coarse Sandstone without Bitumen	15
a grey dry Clay	3
the lower Part of the rough Rock which is a	

kind of very coarse sandstone containing Bitumen	27
a brownish dry Clay	20
Top Coal, which is the fame that in the former list is called the Yard Coal	2¼
The Blacks. A blackish dry Clay	7
The Silk Coal	8 inches
a Bass, a black indurated shistose Clay	1½ foot
a dry Clay, containing very good Ironstone	2
Bottom Coal, called in the other list Flint Coal	3

After this stratum, the strata, in part, correspond with those of the preceding lists in respect to the order, but not to their thickness, as the following list shows.

The Flint	15 feet
The Pinny Measure, (no Curl is found in The Stinking Coal, containing but a small quantity of Pyrites, and this much more earthy than that of the other Mine, so that this is not used for Copperas	18 inches
The Upper Clunch	12 feet
An Argillaceous Sandstone	21
The Two-foot Coal	2
A Dry Clay	12
The Vigo Coal, sometimes got, when near the Surface, for burning Bricks	1 foot
An Argillaceous Sandstone	1
The Ganey Coal, sometimes got	2-5 feet
A dry Clay, this is the Linseed Earth of the first List	7½
The best Coal, this is got in the Parish of Madeley	2
A Bass	9 inches
The Middle Coal, the Randle Coal of the first List	2½ feet
A dry Coal, the Bannack of the first List	6 inches
The Clod Coal	2 feet
Clod Coal Poundstone, the pale blue Clod of ditto	7
Hard Sandstone, sometimes containing Nodules of Ironstone	3
Little Flint Coal, got in the Parish of Madeley, and esteemed a very good Coal	3
Little Flint Rock, the little Flint of the other List : here it contains a good deal of Ironstone called Crawstone,	20-80 feet.

Then the dye earth is found. Thus we have a mass of strata about 400 feet thick

The coal district of Coalbrookdale, like other extended coal fields, is troubled with faults ; that is the strata are broken and in some parts lie much lower than they do in others. The principal faults in this district run nearly N. E. arid S. W. Two of these have thrown the strata on the E. and W. sides from one to two hundred yards lower than they are in the middle. This elevated middle district, which does not affect the surface, is about seven miles in length, and from one to two in breadth, and it is here, on account of the greater facility of working the mines, that by far the greatest quantity of coal and ironstone have been "got. The Madeley Wood and Lightmoor works are the only collieries in the eastern depression, which is here called a swamp, ; and the Ketley and Hadley the most western in the western swamp. The elevated district has several faults running in various directions which have caused depressions, some of which are fifty or sixty yards. - This is a general account of this valuable district.

In the parish of Wombridge the stratum of coal, called the flint coal, incloses in its middle a stratum of canal coal about nine inches thick; this situation in some parts of the same stratum is occupied by a bass.

The so famous spring of mineral tar or pitch (Maltha of Lin.), exudes from fissures in a sandstone impregnated with it, and lying over a stratum of coal, but from which it is separated by an argillaceous stratum. At this present time it only yields about thirty gallons per week, formerly it yielded near a thousand gallons in one week ; and at first, when the level or adit was driving, many barrels were collected in one day. It is supposed that were there a greater demand for it, a much greater quantity could be obtained by driving through fresh fissures. In the upper part of this bituminous sandstone, a great many rounded pieces of coal are imbedded. In the neighbourhood of this tar spring, several springs of salt water have been found, but none lately of sufficient strength to be worth working. The water which exudes from the flint-coal in some works in the parish of Madeley, is likewise salt; and in the adjoining parish of Broseley there was formerly a salt work, where the salt is said to have been made from water taken out of the coal pits, which, to this day, are called the Salt House Pits. The famous spring which formerly threw out so great a quantity of inflammable air was at Broseley. The strata of this district, like those of other coal fields, inclose many animal and and vegetable productions ; few however in the upper strata. In the ironstone nodules, called the ballstone, the impressions of various ferns are common. In the blackish grey dry clay, called the flint coal, a kind of muscle shells and some vegetable impressions are found.

In the sandstone called the flint there is an immense quantity of those vegetable petrifactions, or rather impressions, which have been compared with some of the cacti and euphorbia tribes ; they are sometimes in cylinders of the thickness of a mans thigh. Another kind resembles the sugar cane, both kinds are of sandstone. - In the Pinny measure, which lies under the last mentioned, no vegetable impressions are found, but some shells of the limpet and cockle kinds. - The bed of dye earth which supports the coal strata contains many of the Dudley-fossils (Entomolitbus paradoxus) and some small bivalves. The tophus turbinatus, calcarius multicorticatus interne imbricatus of Linneus, and figured in Table II. Fig. 36 of the second volume of Wallerius, ere called curlstone, forms an almost continued stratum in the Pinny measure, No. 54. The points of the cones always point upwards. It has been occasionally used both as a flux for the ironstone, and, after being burnt, as marl for

manure. It dissolves with effervescence in acids, but some of the interior cones are so hard as to strike fire with steel. - The columnar iron ore, the ferrum basalticum, Syst. Nat. a Gmel. the Fer limoneux brun et prismes pentaedres et heptaedres, &c. of Mr. Bornes Catal. Method. &c. vol. II. p. 283, from Hoschenitz in Bohemia, and other places on the continent, which so well resembles basaltic columns in miniature, is common at Ketley, but this form, here, is the result of torrefaction.

In the limestone quarries at Lincoln Hill, near Coalbrook Dale, large geodes full of fluid pitch (Maltha. Lin.) are frequently found. In this coal district are the following iron works. In the south is Willey, Broseley, Calcot, and Bental; these are on the south side of the Severn. On the north side of this river is Madeley Wood, Coalbrook Dale, Lightmoor, Horse Hay, Old Park, Snedshill, Ketley and Donnington. These works employ about six thousand hands ; and annually about 260,000 tons of coal are raised in this district. It is worth remarking, that Coalbrook Dale can justly claim the merit of having, in the beginning of this century, introduced upon a large scale, the use of coaked coal, as a substitute for charcoal, in the making of iron.

Towards the northern end of the coal district is Lilleshall Hill. Judging from some specimens I have seen it is of jasper, flanked with limestone on its north end and eastern side. Kingley Wich is about two miles west of the same district. It has a spring of salt water which yields four or five thousand gallons in the twenty-four hours. It is an impure brine, but was formerly used; the salt pans and buildings are still remaining. It flows out of a reddish sandstone rock which rests upon a reddish chert, like that of the Wrekin. And at Admaston, near Wellington, only two miles from Kingley Wich, there is a salt medicinal spring, calybeate and hepatic ; formerly it was in great repute; it is still much frequented by the lower class of people. — Before we leave this part of the county I must note, that lately a colliery has been opened near Dryton, on this side of the Severn, about halfway between Coalbrook Dale and Shrewsbury. — This is a sketch of the first division of the county. When we cross the Severn at Shrewsbury, and enter what I have denominated the hilly division of the county, we do not immediately find ourselves amongst those hills which give the title to this appellation. The flat country still continues, but gradually diminishing in breadth towards the south, terminates in a valley formed by the Lawley and Caradoc hills on the east, and the Longment on the west.

Passing westward along the banks of the Severn, red sandstone I believe prevails ; but about Rowton and Loton Hall limestone is found. Nearly in the same direction, but two or three miles from the Severn, lies another coal district, but trifling in its produce, when compared with that I lately described, with which this seems to be almost connected by the colliery of Preston Boat, and that near Dryton. It begins about Emstree, and extends about a dozen miles westward through Stitton, Meol, Pulley Common, Nobalt, Hooka Gate, Whelbech, Ascot, Pontsort, Pontesbury, Malehurst, Asterley, Inwood, and Woolaston; and, from near Whelbech, a branch extends a few miles southward to Longdon Common and the Mote. Near Pontesbury the hilly district begins. Here I only examined the Ponsort Hill, about nine miles from Shrewsbury. This is a hill of very considerable height and steep ascent. Ascending it by its most gentle slope, I found at its base different kinds of chert, as Isabella coloured, greenish white, reddish white ; and one of a glandular structure, having brownish red glands, rather cellular at the centre, partly filled up with quartz, which are united together by greenish grey chert ; likewise a liver coloured chert or jasper,

with flesh coloured streaks. But the hill itself, as far as my observations extend, is composed of dark greenish grey wackế, greyish black basalt, and finely granulated wackế, or rather grau-wackế, for though carelessly examined this appears to be a homogenous stone, and has the usual colour of wackế yet, when examined with a lens, it appears to be an aggregate. The aggregate differ in their products only by yielding a considerable quantity of black jack or blende.

Further south there are, I believe, some other mines of the same nature. To the west of these hills, on the confines of the county, from Westbury, in the parish of Ford, to Montgomery, shistose clay (schiefer thon), and shistose argillaceous sandstone or flagstone are the prevailing strata ; though at Lee, about a mile south of Worthin, there are rocks both of wackế and of chert. At Wotherton a very thick vein of heavy spar breaks out; here I am told some lead was got a few years ago. The Longmountain, part of which is in this County and part in Wales, is likewise composed of shistose clay. Of this part of the county I can say but little, having never visited it, and I form this sketch from some specimens for which I am indebted to the kindness of the Rev. Mr. Newling. If we direct our course eastward from the white-grit mine, we find rocks of brownish grey argillaceous shistus or indurated clay, then a hill covered with large blocks of whin or coarse basalt, and about a mile or two further the Bog mines. These mines are in argillaceous shistus, and produce galena Lead.

In building a cottage on the Longment near Darnford, a very small vein, (not a very thin bed or stratum,) of coal was found. It is really a vein, but not, I believe, an inch thick. On crossing Smetcot Common I found a vein of wackế, and the road between Polder-bach and Haberley is crossed by a vein of heavy spar mixt with quartz, above a yard thick. Near Lebottewood, eight or nine miles south of Shrewsbury, in the valley formed by the Longment and the Lawley and Caradoc Hills, coal and limestone are found. Here the limestone, which is covered by twenty yards of argillaceous strata, is four or five feet thick, and lies above the coal, from which it is separated by about ten yards of similar strata. The coal is about a yard thick. The limestone contains petrifactions, and has frequently little chinks and cavities filled with pitch. The coal is chiefly used for burning the limestone ; both together only give employment to about a dozen men. About two miles south east, at the foot of the Caradoc, coal and limestone are again found, and were formerly worked.

The Longment is only separated by a narrow valley form a beautiful chain of high hills, about seven miles in length, running from the north-east to the south-west, composed of the Lawley, the Caradoc, the Elmlyth, the Hazeler and the Raglyth. This valley between the Longment and the Lawley may be about two miles, but it is much narrower towards the Caradoc. The Lawley, which is the most northern, is about two miles long, but very narrow, with very smooth sides of rapid ascent, clothed with verdure, and uniting at top in a sharp ridge. It is composed of a dark bluish grey, hard, heavy and compact wackế. In some parts a stone similar to No. 5 of the Caradoc, (which will be described immediately) is found. And in many places rocks of light reddish brown jasper and reddish white petrosilex protrude through the soil. Quite at the north end, where the rock has been broken for materials to mend the roads, an imperfect or ill characterised granit or granitoid rock is found. It is composed of red feldspar, white quartz, and blackish green hornblend ; but only in the most perfect specimens.

In general it is rather of the nature of granitic sandstone, and has some appearance of having been formed by deposition; a little mica lies between the small beds which are but just indicated. I have some specimens where the components are not distinct and granular ; where the quartz and feldspar, mixed with a blackish green earthy substance like wackế, flow into one another. This granitoid stone seems to form only a wedge or patch amongst the wackế. At the south end of this hill I found the same as No. 8, of the following article. The Caradoc or Quardock is only separated from the last hill by a narrow valley. It is likewise a ridge hill and very similar in form to the preceding, of the same length, and runs in the fame direction, but exceeds it in height, and rises considerably in the middle. The north end is composed of greyish coloured sandstone, in which grains of red feldspar and other matter are mixed with the quartzous sand. In some specimens, when examined with a lens, something like pitch is seen to fill the interstices between the grains.

Further south, I found (No. 5) a greenish grey kind of whin or wackế. It is not a homogenous stone, but rather an intimate mixture of a greenish black substance, probably of the nature of hornblende, with a greenish white substance which is easily scratched with a knife, and makes no effervescence with acids : then amygdaloid rocks prevail. First I found (No. 8) a blackish grey compact wackế, very nearly approaching the true compact basalt, with glands, about the size of a large pea, of fasciculated and stellated-fibrous pistachio green actynolite (actinotus). These glands easily melt under the blowpipe into a blackish slag with ebulition; this fossil I don’t recollect ever to have read of or seen before. It may be called the Amygdalites actinotus. In the same part of the hill there is a blackish grey wackế very cellular, with small hemispheres of haematites, the size of a pin's head, scattered about the sides of the cells. Here likewise small veins of blood red jasper, and some agate are found.

Further south, on each side of the little dell which divides this hill into the Little Caradoc and the Caradoc, great blocks of hard white siliceous sandstone abound. Then the amygdaloid rocks are found again. One kind is a dark brownish red wackế, thickly strewed with very small glands of white zeolite and white calcareous spar ; and another is a blackish grey wackế with cells, only in part filled, with flesh-coloured and white zeolite and calcareous spar, all mixed together. Some of this red substance melted without intumescence or phosphorescence more like feldspar than zeolite ; these three different kinds of fossils are so mixed together that it is difficult to investigate them.

The rocks on the top and those still more southward, are of jasper. I have from thence a reddish brown compact jasper. The same but fine-cellular with the sides of the cells invested with green earth. A light brick coloured jasper, dull, and rather softer than a true jasper, with small oblong greenish black spots ; and a liver-colour jasper with small oblong glands of white calcareous spar. I have-from some part of this hill a black- brown jasper, with two little cavities in which are minute rock cristals, and minute rhomboidal cristals of flesh-coloured feldspar. Wherever there is any appearance of stratification, the strata cross the hill and rise towards the north. It is at the foot of this hill on the western side, that I lately said both coal and limestone were formerly got and length to either of the preceding. Ascending it on the west side I found a singular kind of compound rock, a kind of granitic sandstone, and at the top

a dark grey wackế, which in some places is intimately mixed and blended with reddish chert and jasper. To the east of this, separated by a valley, is the Hope Bewdlar Hill, of which I only examined the south end; this is of porphyry, of a liver-coloured ground of hard wackế with reddish feldspar. To the south of the Elmlyth lies the Hazelar Hill. At its base, near the high road, there is a quarry of reddish sandstone; but of a very curious kind. If examined with a lens it is seen to be wholly composed of small grains of flesh-coloured feldspar and grains of quartz, with scarce a particle of mica; however, on a nice examination, a few spangles of black mica are discovered. It is quarried for mending the roads. The rocks above, which protrude through the soil, are of liver-coloured wackế. To the south of this is the Raglyth. The rocks on the very summit are of reddish grey, in another part of light flesh-coloured, chert. But on the western side I found the rock to be a compound or aggregate stone, very difficult to be described. At first sight it appears as if small particles of reddish feldspar were imbedded in a coarse grey earthy basis ; but, examined with a lens, it appears to belong to the compound sandstones ; it is composed of grains of feldspar, grains of quartz, and some earthy matter. This hill terminates the chain of primitive hills, which began at the Lawley ; and, south of the Raglyth, to a considerable extent, the stratified rocks prevail, which may be seen in the turnpike road to Ludlow. The strata I have observed are of the nature of argillaceous sandstone and flagstone.

If we come back to the Lawley and Caradoc, and then continue our course eastward, we find under both these hills, on their eastern side, a parallel range of white sandstone, which in some places has a very coarse grain. Where it is most regular, as under the Lawley, it presents its escarpement towards these hills, from which it is divided by a small valley. Under the Caradoc on one spot it forms a little conical hill. It extends northward to Frodesly Park, and continues thence in an eastern direction to Buckley, and further eastward forms the high ridge on which the village of Kenley stands ; here it is of a very coarse grain. This ridge runs parallel with the Wenlock Edge. About two miles N. W. from Frodesly lies Pitchford, and four miles further to the N. W. is Cundover. This country, and all, I believe, that lies from hence in a north east direction to the Severn, is sandstone. Pitchford is famous for a well on which pitch is found floating, and for a bed of sandstone and a sandstone mixt with fragments of grey shistus, both highly impregnated with mineral pitch; this is the stone which is called the British oil rock, and from which the British oil is distilled. This rock is only covered by a few feet of gravel and soil. Coal was got in this parish about fifty years ago, but not in quantity, nor of a good quality. If we again come back to the east side of the Lawley and Caradoc, and continue our eastern course for a mile or two, to the village of Cardington, we only meet with argillaceous sandstone or flagstone. On this kind of strata the village stands, and thence it extends a considerable way further to the N. E. whilst to the south of the village, on the common, wackế and chert, like those of the Lawley, are found.

Here, some years ago, a trial in mining was made in search of copper, and some yellow copper ore was found, but of no consequence. But the bold craggy rocks near the village are of a very hard compact siliceous white sandstone. In continuing a S. E. course for two or three miles I met with no rock to give me any hint of the strata here, but on the east side of the village of Rushbury, there is a high range of common grey limestone rocks with petrifactions. They face the chain of hills I lately described, and, running parallel with it, extend several miles both to the N. E. and

S.W. At the back of this lies a similar range of limestone rocks of many miles extent, but higher, and with more prominent features, called the Wenlock Edge. It has the same facing or escarpement, and the same course, and in its N. E. direction extends as far as the banks of the Severn opposite Coalbrook Dale. It is cut by some deep dells or narrow vallies, so as to resemble several promontories, some of which being covered with wood are very picturesque objects. As I followed the inclination of the strata, which of course is nearly eastward, I saw several thin strata of flagstone lying amongst the limestone. Continuing in the south east direction I found, near the village of Howgate, two or three miles further, coarse grained sandstone. As I approached the Brown Clee Hill, which lies to the S. E. I met with nothing but immense quantities of loose fragments of true basalt, and in one or two places some red sandstone.

The Brown Clee Hill, and the Titterston Clee Hill which lies three or four miles to the south of the former, are amongst the highest hills of Shropshire, and are, particularly the latter, treasures for this part of the county. They belong to the fiat topped hills, but are very irregular in their forms. They are about five or six miles in length, and about half as much in breadth. They resemble each other in their products ; both contain coal and ironstone, which in both are in some parts covered by a thick bed of basalt, and this basalt, in each, forms two irregular ridges higher than the other parts of the hill. They further agree in their strata dipping all round from their circumference to the centre, like the sides of a bowl. But they differ greatly in the quantity of coal they yield. The coal in the Brown Clee Hill only lies in thin strata, and is chiefly worked in a small way by poor colliers, whilst the principal coal stratum in the Titterston is six feet thick. For the following particulars of the Titterston Coal Fields, I am indebted to the communications of Mr. Thomas Botfield, jun. of Ditton. On this hill there are six different coal-fields, which differ considerably in their extent and thickness. The most extensive and valuable is the Cornbrook ; this is about a mile long and half a mile broad. The two following lists will shew what are the strata in this field. The immense bed of basalt which lies above the coal, is a remarkable circumstance in this part of the kingdom.

Strata found in sinking the DEEP PIT in the southern Part of the Hill.

	yds	feet
Earth and Sandstone Rock	10	1½
Basalt, called here Jewstone	64	1½
Sandstone Rock, Bind, Clunch, and Coal Roof. Dry Clays	23	0
The Great Coal	2	0
Coal-bottom and Ironstone Roof. These are Dry Clays	1	1
Ironstone Measure. A dry Clay	1	0½
Three-quarter Coal	0	1½
Clumper. Hard dry Clay	2	0
Smith's Coal	1	2
The Smith Coal-bottom. Dry Clay down to the Four-foot Coal Rock	0	2

The Strata in the WATER PIT, which is about a quarter of a Mile to the North East of the preceding, are

	yds.	feet
Basalt, here called Jewstone	48	0
Brown and white Clunch. Dry Clay	6	0
Red Rock. A yellowish Sandstone	9	0
Bind and Clunch. Dry Clays	9	0
Pinney Ironstone Measure. Dry Clay	1	0
Clunch. Dry Clay	3	0
Brown Rock. A yellowish Sandstone	6	0
Tuff (plastic Clay) and Sand	1	0
Black Bind. A dry Clay	4	0
Rock. Very coarse Sandstone	5	0
Strong Clay	1	0
Horse-flesh Earth. A variegated red and white Marl	6	0
Grey Rock. Sandstone	6	0
Bind. A dry Clay	2	0
Great Coal Rock. Whitish Sandstone	6	0
Coal Roof. Dry Clay	3	0
The Great Coal	2	0
Coal-bottom Pounsin. A dry Clay	1	0
Ironstone Roof and Measure. A dry Clay	1	1
Three-quarter Coal and Bass	0	2
Clumper. A hard dry Clay	3	1
Smith Coal, and Clod in it	1	2
Strong Clunch. Dry Clay	2	0
Flan and Bass. Hard dry Clay	0	2
Strong Clunch. Dry Clay	3	0
Four-foot Coal and Bass	1	0
Strong brown Clunch. Dry Clay	1	0
Sunk into the Four-foot Coal Rock	3	1
	137	0

The Newbury Coal Field, which is in the south end of the hill, is about half a mile long by a quarter broad. This has the same number of beds of coal as the preceding, but they are always about one third thicker. The basalt does not cover the coal in this field, nor is it found in it. The other coal fields, which are like wise never covered by basalt, are of small extent, and have only one stratum of coal from eighteen inches to two feet and a half thick ; or the same divided into two by a thin bed of clay. What is the nature of the strata that succeed to those mentioned in these lists, has fortunately been pretty well ascertained by the Road-level, which discovered about seventy yards of sandstone strata, mixed with some strata of clay. And from the situation of the limestone in the neighbourhood of this level, it is most probable that many more yards of sandstone lie between those and the lime-stone. At the lime-works at the Knowl, where there are several beds of limestone alternating with clays mixed with sand, it appears that these lie under the above strata, and form, as it were, the foundation of these collieries. Were 1 to say more on the stratification of

this hill, it would be merely conjectural. But if it is permitted to make an induction from appearances in the neighbouring brown Clee Hill, with which this agrees in so many particulars, then I may say that there are a great many strata of sandstone, and some with a calcareous cement, lying under the limestone strata. For the limestone bassets out very high in the southern end of that hill, and from thence to the bottom nothing is seen, wherever the water has laid the rocks bare, but sandstone.

It is conjectured that at the Hill- Work Coal Field (one of the six) the basalt lies under the coal. This little coal field lies upon, or is surrounded by, the Cornbrook Coal Field, and when the coal in this latter field is cut off by a fault in the neighbourhood of the former, the miners in working in that direction have always come to basalt. All these little coal fields, with their accompanying strata, dip all round from their circumferences to their centres, and are to be considered not as parts of one great bowl, but as so many small ones. Canal Coal is found in this hill. On account of the great expence of sinking through the basalt, coal is here about one-third dearer than in the Coalbrook Dale district. Both these hills, like others similarly situated in this part of the kingdom, have the vestiges of ancient fortifications on their summits. The highest parts of both are inclosed by a dyke or mound, which differ from most others in this, that they are not of earth but of loose fragments of basalt, which are found in great abundance on these hills. The dykes are about six or eight yards broad at their bases, but now nowhere above three or four feet high, and seldom that. From these hills the Caradoc and the Malvern hills, both of which have still the remains of fortifications, are distinctly seen ; and these, by lying between them, were well adapted to keep up a correspondence by signals. About two or three miles N. E. lies Orton Bank, which furnishes a great quantity of lime for that part of the country. The lime rock is composed of several strata, varying a little in colour and grain. I observed one stratum of the Oolithus (Bath and Portland stone), it lies between strata of common limestone. Sandstone prevails in the neighbourhood.

About Kinlet, which is further east, there are some small hills where whin or basalt is found, with small calcareous glands. Billingsley, two or three miles to the N. E. is a coal country; it produces likewise the argillaceous ironstone. A company has lately established a considerable colliery here. In the wire Forest, and -about the banks of the Severn in that nighbourhood, sandstone strata prevail, and likewise from the Clee Hills to Bewdley, on the confines of Worcestershire, and about Bridgnorth, on each side of the Severn ; and from Bridgnorth in a north east direction to Tong Castle and Weston, on the borders of Staffordshire ; likewise in the most southern part of the county on the borders of Herefordshire I have found sandstone. About Ludlow limestone hills are common. The castle is built upon a grey argillaceous stone, a kind of very fine grained argillaceous sandstone, the Arenarisus glareous Syst. Nat. Cosglareosa, particulis impalpabilibus mollis. Wall.) and this and similar kinds of strata are, I believe, common in this neighbourhood, and to the westward in the hundred of Clun on the confines of Wales.