



The "Stonesfield Slate," which occurs at the base of the Great Oolite, furnishes good "slates" in places, such as have been used in the roofing of St. Matthew's Church at Cheltenham. It has been largely worked in the past on Sevenhampton Common and Eyeford Hill, and one quarry is now open at the former locality and two at the latter. These beds have been opened out at Througham, near Bisley, Stroud.

The "Great Oolite" has been extensively worked for a long time on Minchinhampton Common. As Mr. H. B. Woodward has observed: "The Weatherstone is a hard oolitic and shelly limestone, of coarse aspect and sandy in places, but very durable when dried by exposure to the sun. The stone does not readily absorb water, and consequently it resists the action of frost. A careful selection is, however, necessary." The Great Oolite is useful for road-metal when other stone cannot be obtained, and the same may be said of the Forest Marble. Both these stones are also useful for walls. The Forest Marble is worked at Ampney Crucis, near Cirencester.

From the foregoing brief reference it will be seen that the county contains the most valuable building-stones, exhibiting almost every variety of colour and texture, and, for the most part, easily quarried. The number of men engaged in quarrying, cutting and dressing stones in the county is nearly 2,000, as given in the last census.

CLAYS.

Clays suitable for making bricks and shaped ware are found in Gloucestershire chiefly in two deposits, known to geologists as Alluvium and Lias. The former deposit borders the Severn and Bristol Avon at various parts of their course. The Alluvium, or mud, brought down by the rivers is usually loamy, although, of course, its composition depends mainly upon the nature of the rocks traversed by the rivers higher up. The most extensive deposits occur near the Severn, and cover a larger area between Purton Passage and Avonmouth than between the Passage and Tewkesbury, although more use has been made of the deposit in the latter district, no doubt owing to the fact that the pits are nearer means of communication with the markets than are those in the southern portion of the county. In the past many pits have been opened out on the banks of the Severn, as the numerous old excavations testify, and there are now pits open at the Upper and Lower Lodes, Tewkesbury, and near Gloucester. There are many places left, however, where pits might be opened out to advantage. Near the river-side at Gloucester the loamy soil appears to be close upon 10 feet in thickness, but it soon thins out as the river is left. Between Oldbury and Berkeley there is a tract of Alluvium, and again between Aust and Avonmouth, aggregating nearly 25 square miles in extent. Unfortunately these tracts are somewhat difficult of access, but this will be remedied when the line from Avonmouth to Pilning is completed.

The other deposit which is valuable for brick-making purposes is the Lias. As the maps at the disposal of the agriculturist and others are those published by the Government Geological Survey, it is necessary to adopt their nomenclature; and for economic purposes, certainly in North Gloucestershire, this is the most suitable. According to the interpretation of that body, the clays found in the vales of Gloucestershire and Evesham belong to the Lower Lias, and the junction of this stage with the middle is near the foot of the Cotteswold escarpment, and is usually indicated by the outburst of springs and damp ground. In the southern portion of the county the Lower Lias does not cover a large area, and the clay-beds are thinner, although there are deposits which might be worked. In North Gloucestershire the clays are of considerable thickness, though it is doubtful if as much is usually thought. However, each zone of deposit has a considerable superficial extent, and this fact is important. Also, in most of these beds which are worked for clay, fossils are of small size—another point for consideration. Several pits are now being worked at different places, and other deposits are available.

About the best place to open a pit is at the junctions of the Middle and Lower Lias. Here the clay is more loamy, and the beds are, therefore, better adapted for brick-making. One or two matters may be mentioned to serve as a guide to locating this deposit. The Middle Lias is composed of this sandy shale and a "rock-bed" or Marlstone above. As the Marlstone is harder than the sub- and superjacent deposits, naturally it constitutes a feature in the Cotteswold escarpment, and on the outliers such as Alderton and Dumbleton, Oxenton,

Bredon, Churchdown, and Robins' Wood Hills. Below it there are the sandy clays, or shales, and their base is indicated by the outburst of springs and wet ground. Gorse-bushes, being particularly fond of a sandy soil, are also frequently useful in indicating its presence; indeed, in the North Cotteswolds this phenomenon is most noticeable. North of Stroud these beds and the succeeding stage, the Upper Lias, occur at rather too high an elevation to be profitably worked; but at Stroud, owing to various causes, the beds are at a lower contour, and accordingly pits have been opened out both here and at Stonehouse, the fine works of the Stonehouse Brick and Tile Company being located at the latter place. At Pilley, Cheltenham, beds containing some impure limestone bands are worked, but the rock and ironstone-nodules have to be picked out of the clay. At Robins' Wood Hill the same and higher beds (almost up to the Marlstone) are worked, and the clay obtained is excellent for brick-making. The south side of Churchdown Hill would be a good site for a clay-pit. In the valley of Cranham is a pit, presumably in Upper Lias clay, which has been worked since the time of Queen Elizabeth, if not earlier. Flower-pots, pans, drain-pipes, etc., are manufactured here.

OTHER MINERALS.

At Wick Rocks, near Mangotsfield, pits have been sunk in the Keuper Marls for ochre, which is ground at the rolling-mills near at hand. In 1890 the ochreous rock was about 4 feet thick, and occurred about 8 feet below the surface.

Celestine, or Strontium, is largely worked at Yate and Wickwar. It occurs in the Keuper Marls, and is found at several places in the Bristol area. It is exported to Germany for use in the refining of beet sugar. Gypsum also occurs somewhat abundantly in the Keuper Marls at Aust Cliff, near Pilning.

DEPOSITS OF SAND AND GRAVEL.

Deposits of "gravel" and sand—the Superficial Deposits—cover a very considerable part of Gloucestershire, especially the low-lying areas. Stretching down the central portion of the Lower Severn Valley is the accumulation of pebbles of quartzite and other hard rocks known to geologists as the "Northern Drift." It has been found a useful "gravel" for drives and mending the local roads, and pits have been opened out in it at Bredon, Shuthonger Common, and Twynning Green; while in the past it has been worked on Sandhurst Hill—perhaps better known as Wainlode Hill. A similar deposit covers much of the Vale of Moreton. Sometimes sand predominates, sometimes pebbles. Deposits of sand are fairly thick in places. According to Dr. Wright, a trial-boring at Hopwood's Nurseries proved as much as 40 feet. Certainly it covers a large area around Cheltenham, but sometimes much "gravel," composed of fragments of limestone from the Cotteswold Hills, are found mixed with it. Pits may be seen near Overbury, Prestbury, Charlton Kings, and Barnwood. Indeed, there are very many localities where it might be worked. Nearer the hills, of course, the "gravel" is mainly composed of the rocks which are exposed in the escarpment, and the deposit frequently furnishes a very good gravel for paths. In the southern portion of the county gravel deposits are rare. There were formerly workings near Bitton. One of the sub-divisions of the Inferior Oolite is a sand-deposit. It occupies a considerable area on the Cleve Hill plateau, and was once dug for use in the Staffordshire potteries.

MINERAL SPRINGS.

It may be proper to add a word as to the mineral and hot springs to be found in the county. Four groups (saline and chalybeate) exist at Cheltenham, the chief spa; hot springs occur at Clifton, and petrifying springs at Kemerton; and warm saline springs occur at Gloucester, Newent and Ambleton. In 1839 Sir Roderick Murchison called attention to the fact that "at the new Spa near Tewkesbury the water, though very slightly saline near the surface, was found to be much more impregnated with salt as the sinking was carried downwards," and he had no doubt that "similar results would follow by deepening any of the mineral sources which are so numerous in the vale of Gloucester—those of Walton, the bottom of Churchdown Hill, etc., for instance."

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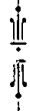
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