EXPLANATION OF THE PLATES.

PLATE 1.

Map of Northumberland and Durham, to illustrate Mr. Winch's paper.

The colouring points out the different rocks. The contact of that series called the Leadmine measures or Mountain limestone with the red marl or sandstone to the westward of Temming towards Brampton is not accurately ascertained, but a little to the south-east it has been traced by Professor Buckland from Melmerby to Murton, and is laid down in the map accompanying his paper (Plate 5.) The letters U and D, placed against the common slip dykes of the coal measures denote that the strata are elevated or depressed on that side by the number of fathoms marked after the letter.

PLATE 2

Is a figure of the fossil Fish, apparently belonging to the genus Chœtodon, found in the magnesian limestone at Low Pallion, as mentioned in page 9.

PLATE 3.

Is a plan, communicated to the Society by Mr. Hill of Newcastle, of the Dyke in Walker Colliery, taken at the level of the High Main Coal, 100 fathoms from the surface. The sectional lines, AA and BB, mark the situation of horizontal drifts that have been cut through the dyke, the particulars of which are given in page 22.

PLATE 4.

Fig. 1. Shows the manner in which the magnesian limestone overlies the Coal measures at Whitley quarry near Cullercoats. The ninety-fathom Dyke is seen passing through the Coal measures, and the limestone appears deposited in a hollow or trough upon them in a manner that shews it to be of a subsequent age, as the former are much dislocated by the dyke, while the latter is not at all disturbed. See page 4.

Fig. 2. Is a sectional view of the Dyke at Walbottle Dean, described page 23

EXPLANATION OF THE PLATES.

PLATE V.

The Map represents the country described in Professor Buckland's paper; in it are marked the lines of the sections, No. 2 & 3.

The sectional figures are imaginary, and intended to shew the supposed relative position of the st ata.

No. 1. Shews the abutment of the red sandstone against the ends of the lower strata of the escarpment, as it is seen both on the north of Melmerby and south of Dufton. The letters A. B. C. point out the abrupt contact of the sandstone against the greenstone and slate. The letters C. D. E. shew its similar position in regard to the lower strata of the great limestone series.

No. 2. Shews the position of the strata in the line marked on the map from Hartside Fell to Ousby, where (at A.) the sandstone is seen abuting against the disturbed and nearly vertical limestone and coal measures, which form a low scar in that part.

No. 3. Represents the strata in the line marked No. 3. on the map, and the beds of stratified entrochal limestone mentioned in p. 114, are seen on the west of Keisley Pike dipping rapidly under the sandstone.

No. 4. Represents the section of the strata as seen in the cliffs from Whitehaven to St. Bees head, where the sandstone is seen lying on the magnesian limestone which is deposited on the coal measures. Mr. Winch, at page 4, mentions that the magnesian limestone is seen also at Whitley quarry lying upon the coal measures.

The dark spot in the red sandstone points out the situation of a gypsum quarry.

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EXPLANATION OF THE PLATES.

PART II.

PLATE 6.

Veins of granite and porphyry traversing the schist of Cruachan.

Fig. 1. Passage of porphyry veins through schist already traversed by veins of granite.

Fig. 2. A similar circumstance, representing at the same time the parallel and adjoining position of two veins of differently coloured porphyries.

PLATE 7.

Plan and Sections of the mine of Huel Peever, shewing the interruptions that have occurred to the veins in that mine. The ground plan, Fig. 1. represents the effects produced by the cross courses intersecting the veins that run in the direction of east and west. The transverse section, Fig. 2. shows the interruptions among themselves of the veins that run in an east and west direction, occasioned by the various degrees of inclination of their underlie. The tin vein is intersected by the copper vein, and they are both again affected in a similar manner by the two slides.

The longitudinal section is explained, p. 144.

PLATE 8.

Tunnel of the Tavistock Canal.

The various beds and lodes met with in working through the hill are here represented, as well as the number of shafts sunk in the process of making the Tunnel.

PLATE 9.

Map of Sky, described p. 156.

PLATE 10.

Agate pebbles from the hill of Kinnoul in Perthshire.

Fig. 1. Represents a hollow nodule containing small chalcedonic stalactites. It is placed in the same position which it appears to have occupied in the rock where it was formed. On considering its construction and comparing it with those of stalactitic caverns on a large scale, it will appear probable that after the deposition of siliceous matter which now forms the exterior crust had taken place, the process of infiltration became limited to its upper part. Thus the superior pendents were formed, while the dropping of the chalcedonic solution from their points has produced the corresponding stalagmite below. Where the infiltration has been most easy the stalactite and stalagmite have met, while the total suspension of the process in another part, has left a portion of the cavity unoccupied. It is easy to comprehend how such a nodule might be found filled with water, or how it might be occupied with quartz crystals instead of chalcedony. It is equally easy to see, that it might under certain circumstances give access to a solution of carbonated lime, in which case the interior would be occupied by a calcareous crystal; a circumstance extremely common. The crystal in such a case would either be found independent within the cavity, or filling up the whole vacuity, according to the length the process had been carried; both of which varieties are well known to mineralogists.

Fig. 2. This example presents a variety of the same process very common in the chalcedonic nodules of Faroe. The stalactite in this example is tortuous, and the bottom of the cavity is filled with horizontal layers of the same substance. Where these specimens are found to consist of parallel laminæ perforated by stalactitic forms, whether straight or crooked, they present a very mysterious aspect, but their formation is easily explained in the same way. The stalagmite in this case assumes the same diffused flat form that calcareous ones often do in large caverns, while as it continues gradually to rise it surrounds and entangles the dependent bodies without losing its parallelism, until the whole cavity is filled and consolidated into one mass.

Fig. 3. This figure represents one of the more obscure cases that occur in the chalcedonic nodules of trap. It may perhaps be explained by supposing that the straight parallel layers were first formed till one half of the cavity was filled, and that the layers parallel to the cavity, which appear above, had been deposited afterwards by the more tedious process to which the ordinary concentric nodules owe their existence. The cavity then remaining has been filled by quartz from a change of character in the percolating solution.

Fig. 4. The same process appears to have been carried on in this specimen, with the variation only that the whole of the upper and last remaining cavity has been filled by the concentric layers.

PLATE 11.

This plate represents a fragment of the rock of Kinnoul, including the junction of the schist and the trap. The vesicular cavities are seen running in lines parallel to the laminæ of the schist, and increasing in size and number where they approach to the trap. The contortion of the laminæ is also represented at the points where the two rocks unite, and in the same place the appearance of a detached fragment is visible. There is unquestionable proof of the existence of such detached fragments in many cases, as they may be found entirely surrounded by the trap, and only discoverable after breaking it. The conversion and prolongation of the schist into ramifying veins is also shown, the schistose structure disappearing shortly after the change takes place.

PLATE 12.

Forms of crystals to illustrate Mr. Phillips's paper on the Measurement of Primitive Crystals by the reflecting goniometer.

PLATE 13.

Map and Sections of the Plastic Clay District on the south-east of London.

The colours represent, 1. Chalk. 2. The formation of Plastic clay. 3. That of the London clay. 4. The tract of Marshes lying along the banks of the Thames—the flat grounds of Southwark, St. George's fields, Battersea and Chelsea, are coloured as belonging to this district, since they appear to have remained in the state of unreclaimed marshes even within the period of historical record: beneath a great part of this district lie the remains of an extensive forest, (vide page 304).

The numbers marked upon the map denote various points, where either natural sections are exhibited or where pits have been opened.

1. Marks the section ascertained by Sir Christopher Wren while laying the foundations of the new Cathedral of St. Paul; see Parentalia and page 287 of this volume.
2. The Tunnel at Rotherhithe or Redriffe; see the section as given in Mr. Webster's paper on the Strata lying over the Chalk, Geol. Trans. vol. ii. page 197. It should be observed that the section of the southern shaft only is there given. In the northern a thickness of nearly forty feet of the London clay was exhibited, in consequence of the dip of the strata in that direction.
3. Between Camberwell and Peckham. Here the shelly beds of the Plastic clay have been found in digging wells at the depth of thirty feet. At New Cross, near this point, they are found at the surface.

4. The pits at Loam Pit hill, described at page 285 of this paper: a section of these pits is represented in this Plate, No. 2.
5. Pits of sand and chalk on Blackheath hill.
6. The cavern beneath the point at Blackheath. This is an extensive adit driven into the substratum of chalk.
7. Sand pits in the middle of Blackheath; these are situated in the upper sands of the plastic clay formation. In the year 1803, an extensive excavation which had formerly been made into these strata was laid open; it was supposed to extend to the chalk beneath, but the roof fell in and the passage became choaked up before it had been explored.
8. On the south-east of Montpelier Row, Blackheath, a pit was opened in the plastic clay, by Mr. St. Leger, in 1805, and manufactured into various articles of pottery. The shelly beds occurred in this pit.
9. Slope of the hill on the north of Vanburgh fields, east of Greenwich. Here the shelly beds of the plastic clay are visible.
10. A chalk pit at the foot of Charlton hill.
11. Extensive sand pits near Charlton Church. This is the inferior sand of the plastic clay; the shelly beds are seen covering it. The section precisely agrees with that of the great Woolwich pits.
12. A chalk pit at the foot of the hill.
13. The great sand pits of Woolwich. The section they present is described page 284, and represented in this plate, No. 3. About a hundred yards on the east, the excavation is continued into the substratum of chalk.
14. Here an abrupt declivity beneath the Marine barracks at Woolwich presents a good natural section of the shelly beds of the plastic clay.
15. The gravel pit at Plumsted, mentioned in Mr. Parkinson's paper on the Vicinity of London. Geol. Trans. vol. i.
16. A deep shaft sunk into the substratum of chalk; mentioned at page 290 of this paper.
17. A pit in the London clay with Septaria; near the rise of Shooter's Hill; see page 290.
18. Chalk pits in the bottom of the ravine between Plumsted and Wickham.
19. Well on Boston heath, mentioned page 291 of this paper.
20. Bridgend place } Localities where the shelly beds of the plastic clay have
21. Near Bexley } been dug into.
22. A deep shaft sunk into the substratum of chalk and there communicating with horizontal adits. There are many such in the woods about Crayford and Dartford heath.
23. Green Street Green } In these localities the characteristic shells of the
24. Cockleshell bank } plastic clay formation are abundantly found; they
25. Betsham. } are particularly described in Thorpe's Costumale Roffense and Hasted's History of Kent.
26. Near Bromley. Here the shells of the plastic clay occur.

27. Sundridge Park. Here are the remarkable pits of indurated shelly gravel, described by Mr. Parkinson, Geol. Trans. vol. i. and p. 299 of this paper.

28. Between Sundridge Park and Camden Place, in the bottom of the valley, is a chalk pit covered with inferior sand of the plastic clay formation.

SECTIONS.

All these sections have been constructed on double scales, viz. a larger scale for the heights or vertical distances and a smaller for the horizontal distances.

No. 1. General Section from Redriffe Tunnel to Knockholt beeches.

This is carried along the line of section marked in the map. The scale for horizontal distance is nearly the same as in the map. The colours also are the same, with the exception that the thick stratum of white sand which forms the lowest member of the plastic clay formation, is here distinguished from the other members of that formation by dotting it.

No. 2. Section of the pits upon Loam Pit Hill, see page 285. The strata are here coloured after nature; their resemblance to those of Alum bay in the Isle of Wight will instantly strike the eye on comparing this section with that accompanying Mr. Webster's paper, Geol. Trans. vol. ii.

No. 3. Section of the Great Sand Pits at Woolwich; described page 284. This section agrees with the preceding in its scale, in its colouring, and generally in the strata which it exhibits; but the partial changes which occur in different points of the same deposits will be likewise observed in comparing them together: the direct distance of these pits from those of Loam Pit Hill is rather more than three miles.

PLATES 14, 15, 16, 17, 18, 19, 20, 21, 22.

Views, Maps, and Sections to illustrate Dr. Mac Culloch's paper on the Parallel Roads of Glen Roy.

Plate 14. A view in the upper part of Glen Roy, representing the terraces and the character of the valley at its commencement. The slope on the right of the picture is part of one of these terraces.

Plate 15. A view lower down, representing the coincidence between the terraces and one of the *lines*. The entrance of Glen Turit is seen in the distance.

Plate 16. A view from near Glen Fintec, comprising that part of the valley where the most perfect and uninterrupted continuity of the several *lines* is visible. On the hill which forms the distances of the picture they are also most perfect in their dimensions and forms.

Plate 17. A view lower down the valley. It serves to represent among other things the disappearance of a *line* where no assignable reason for its absence exists.

Plate 18. Sketch of the ground explanatory of the several appearances described in the paper. The cross lines refer to the sections in Plate 21. The upper part represents such profiles of the *lines* as seemed most necessary for the elucidation of the subject.

Plate 19. A Map, which serves to represent the several vallies that communicate with Glen Roy at the altitude of its *lines*. It also points out the communication which it would have with the sea were it now filled with water to the level of its uppermost *line*, the colour indicating both.

Plate 20. A Map, for the purpose of pointing out on a larger scale the communications of Glen Roy with the vallies in its vicinity that bear the marks of the lines.

Plate 21. Sections referred to in Plate 18.

Plate 22. Ideal sections referring to the circumstances represented in Plate 19.

PLATE 23.

Porphyritic veins traversing the schist of St. Agnes in Cornwall, described in the Rev. J. J. Conybeare's paper, page 401.

Fig. 1. Is a view of Cligga Point, the promontory of which is formed of granite resting upon the schist. The vein of elvan is seen passing through the schist dipping at a smaller angle than that of its stratification.

Fig. 2 & 3. Are different examples of the veins of elvan in the schist, representing some of the irregularities that characterize them.

PLATE 24.

Appearance of the Paramoudra, and of other siliceous veins and nodules in chalk.

Fig. 1. Part of a vertical section of a chalk pit, near Moira, shewing in their relative proportions the chalk alternating with flinty nodules, with three specimens of Paramoudræ in their matrix.—(Scale half an inch to a foot).

Fig. 2. Specimen of a Paramoudra from the same place, presented by Dr. Bruce to the Museum at Oxford.

Fig. 3, 4, 5, 6. Other specimens seen in the same chalk pit near Moira.—(Scale of Nos. 2, 3, 4, 5, 6, an inch and a half to a foot.)

Fig. 7. Fragment broken from a Paramoudra inclosing a small cluster of hexagonal cells, supposed to have been accidentally introduced from some extraneous body. (The drawing is magnified much beyond the natural size.)

Fig. 8. Veins of plated flint at Hurley Bottom, near Henley, cutting the beds of chalk and flinty nodules. (See Note, page 417.)

Fig. 9. Veins of flint cutting the chalk at Rottingdean, with strata of plated and nodular flints in the same section of the cliff.—The lines represent strata and veins of plated flints. The dots express siliceous nodules. (See Note, page 417.)

PLATE 25.

Fossil Shells found in the slate of Tintagel and of Snowdon.

PLATE 26.

Represents a Shifted vein in the Limestone, with explanatory diagrams.

Fig. 1. Represents a fragment of the millstone with the present appearances of the disjoined parts of the vein.

Fig. 2. An attempt to replace the vein in its original position. The dotted lines, which represent the directions taken by the separated parts of the vein, also indicate the intervals of the laminæ to the sliding of which the present appearances must be attributed. The want of parallelism in their relations is intentional, for the purpose of gaining sufficient space to represent each part distinctly.

Fig. 3. Represents a similar vein traversing a number of parallel laminæ, in its natural position.

Fig. 4. The same vein after the motion of the laminæ, with the effects that would follow both in its own appearance and in the shape of the including rock.

PLATE 27.

Chlorite crystals and vegetable remains in quartz and chalcedony.

Fig. 1. Shews the vermicular accumulations of chlorite crystals which occur in quartz.

Fig. 2. The same magnified.

Fig. 3. Supposed from its structure to be a conferva :—in a chalcedony.

Fig. 4. Another similar substance in a similar situation.

PLATE 28.

Fig. 1. Shews the veins of granite passing into the schist in the Mourne Mountains. The upper, or lighter tinted part represents a portion of the granite which forms the summit of the mountain, the lower dark part the schist, into which the veins of granite run. At the mouths of the veins are sometimes seen small insulated pieces of the schist.

Fig. 2. Shews the peculiar disposition of the colouring matters in the killas rock at the Gun Wharf, Plymouth Dock, described in Dr. Mac Culloch's paper, page 399.