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A description of the principal picturesque beauties, antiquities, and geological phenomena, of the Isle of Wight

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EXPLANATION OF THE PLATES.

PLATE I. *Clay Cliffs, Whitecliff Bay, I. W.* H. C. E. del. P 23 ✓

THIS view is taken looking north-west from the foot of the Chalk Cliffs. The mass of broken ground on the foreground, is chiefly deep red clay, similar to the stratum described in Alum bay. The second cliff has the thin strata, curved at the top, and described at page 23. The third cliff has the stratum of gravel, described page 119, and drawn more at large in Plate XVI. The lower cliffs seen more to the right, belong to the undisturbed country, and the bended limestone, given more at large in Plate XV. The whole contents of this Plate form part of the view of Whitecliff Bay, Plate XVII. No. I.

PLATE II. *Chalk Cliffs, Whitecliff Bay, I. W.* H. C. E. del. P 23 ✓

THIS view is looking South. The strata of flint are not visible here, as they incline towards the spectator; the strata lie over each other like vast tiles. Turning round the point to seaward is the great Eastern face of the Culver Cliff. See pages 23, and 78.

PLATE III. *Dunnose Cliffs, I. W.* H. C. E. del. P 72 ✓

THIS view is looking northward. The perpendicular and parallel fissures in the cliffs, which give them a very peculiar character, are copied from nature, as are the masses in the foreground, which, having separated and slid down from the face of the cliff, have fallen as it were backwards. This view was taken in the summer of 1810, and since that time the appearances of this range of cliffs have been very much altered by a great earth-fall. See page 72.

PLATE IV. *Blackgang Chine, I. W.* H. C. E. del. P 85 ✓

THIS view is taken from the shore at low water, looking N.E. The highest point is 400 feet above the sea. The water-fall is 74 feet. The horizontal strata of stone, from their colour, are more strongly marked in nature than in the print. While this drawing was making, three soldiers descended down the side of the precipice, which is in shadow; and where, from the place in which I stood, the face of the hill seemed absolutely perpendicular. A peasant of the place seemed as much astonished at the bold activity of these men as I was. See page 85.

PLATE V. *Freshwater Cliff*, I. W. H. C. E. del. P 79 ✓

THIS view is looking westward. The lines in the face of the Cliff are the highly inclined strata of flint. They do not appear in the face of the cliff to seaward. The dark opening in the cliff, at the bottom, is the entrance to the cave. The detached mass of chalk in the sea, is one of many remains of the cliff washed away by the sea. See pages 27, and 79.

PLATE VI. *Cave at Freshwater*, I. W. H. C. E. del. P 80 ✓

THE high inclination of the strata of chalk, divided by the layers of flint, is seen distinctly. The ceiling of the cave is nearly flat, and is formed by the parting of the chalk, at a transverse fissure, as described at page 27. Through the lateral openings, is seen the range of chalk cliffs towards Compton. The left hand opening also gives a view of one of the large insulated masses of chalk to the East of Freshwater gate. The extreme land seen through the mouth of the cave is St. Catherine's Head.

PLATE VII. *Knighton House*, I. W. H. C. E. del. P 105 ✓

THIS view is looking northward. The plain square tower to the right, with a buttress, is the most ancient part of the house, and has a deep dungeon under it. Among the trees just behind that tower, rises the spring which supplies the mill dam in front. The hovel in shadow to the left, is part of an ancient building, with a singular window in it. See page 105.

PLATE VIII. *Chale Farm*, I. W. H. C. E. del. P 109 ✓

THE building in the centre, with the pointed window, was the hall of the ancient mansion. In its side is to be seen the remain of a semicircular arch. The window looks north. The large and magnificent stone barn stands about 100 yards to the right of the view. See page 109. The wintry effect is merely given for the sake of variety.

PLATE IX. *Arch in Yaverland Church*, I. W. H. C. E. del. P 102 ✓

THIS highly enriched arch is the only entrance into the Chancel, from the Nave of the Church. So solid a wall of separation, and so small an opening, are not common, and mark an high antiquity. The broken aperture in the wall, behind the pulpit, opens into the chancel, and contains the remains of the stone stairs, described in page 102, and which ascended to the ancient Pulpit or Ambo.

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PLATE X. *The Ivy House*, I. W. H. C. E. del. P 112 ✓

INDEPENDENT of the very picturesque appearance of this cottage, the extent of the ivy tree is an object of curiosity. The Stem is seen on the internal angle of the building. It is described in page 112.

PLATE XI. *Long Stone*, I. W. H. C. E. del. P 89 ✓

THIS stone is described at page 89. It is 12 feet high. The flat stone there mentioned, is partly seen to the right of the upright one. See page 89.

PLATE XII. *Part of Quarr Abbey*, I. W. H. C. E. del. P 93 ✓

THIS is almost the only part of the remains of Quarr Abbey, which presents a subject for the pencil. To what part of the building it originally belonged, cannot now be ascertained. See page 93.

PLATE XIII. *Chapel at Swainston*, I. W. T. W. del. P 104 ✓

THIS pretty building, (now a brewhouse) had never been drawn. The window much resembles those in Arreton church, and is probably of about the same date. See page 104.

PLATE XIV. *Doors at Yaverland and Shalfleet*, I. W. W. A. del. P 102 ✓

THE door at Yaverland has, besides the usual zigzag, a moulding of unusual form. It something resembles, in its effect, those rows of birds' heads sometimes met with in arches of this style. The present door-way has been made higher, by cutting out a part of the ornamented flat. See page 102.

The door of Shalfleet is only curious for the bas-relief over the entrance. Subjects of this sort are not unfrequent; but this meaning has, I believe, been never made out. They were perhaps symbolical of the victory of Christ over the Devil. See page 101. These two drawings are from the elegant pencil of Mr. Alexander.

PLATE XV. *Vertical and curved strata, Whitecliff Bay*, I. W. T. W. del. P 119 ✓

THIS is a near view of the strata in the north side of the bay, the whole of which is seen Pl. XVII. No. 1. The vertical strata, to the left of the figure, are composed of clay and sand: the curved stratum, to the right, is the calcareous rock with freshwater shells, and the same bed as Bembridge ledge. When it approaches the vertical strata, it turns upwards, and is suddenly broken off. The strata of clay, immediately under the curved part, being overgrown with bushes, no distinct section can be seen; but it is probably conformable to the bed of rock which lies upon it. The soil above the calcareous rock consists of clay and gravel. See page 119.

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PLATE XVI. *Vertical Clay Cliffs, Whitecliff Bay, I. W.*

T. W. del.

P. 120 ✓

THIS sketch represents a small portion of the cliff. The stream of water which comes down is one of several that have formed gullies that divide the cliff into separate parts. On the top of some of these, a horizontal stratum of gravel, eight or ten feet thick, lies in an unconformable position, shewing that the ends of the vertical strata must have been subjected to a considerable action before the gravel was placed upon them. See page 120.

PLATE XVII. No. 1. *Whitecliff Bay from Culver Cliff, I. W.*

T. W. del.

P. 121 ✓

THIS view was taken from the foot of the chalk cliff on the south side of the bay, from which the whole of it is seen. A is the bottom of the chalk cliff, the beds of which are nearly vertical. The clay cliffs extend from B to C: D is the curved calcareous rock represented on a larger scale in Pl. XV., and may be traced from this place to E, at Bembridge ledge: F is the opposite coast of Hampshire. See page 120.

No. 2. *Colwell Bay, and the Needles, I. W.*

T. W. del.

THIS view was sketched from the sea. The distance, under A, is part of the middle range of chalk hills extending from the Needles to Freshwater gate. Under it, is the middle of Colwell bay, where the strata dip in opposite directions. Under B, is the north side of the hill called Headen, composed of freshwater strata alternating with those of marine formation. These cliffs are in a constant state of ruin: every winter large masses fall down, and form terraces that reach into the sea: but it is very difficult to walk over them, on account of the quagmires made by the numerous springs. Beyond, at C, are seen the chalk cliffs of Alum bay with the Needles. See page 160.

No. 3. *Alum Bay, and the Needles, I. W.*

T. W. del.

THIS view is also taken from the sea, to the west of Alum bay. Under A, is the west side of Headen, where the alternating series of freshwater and marine strata are best seen. At B, is the curved part of the lower freshwater strata which come up against the vertical clay and sand strata of Alum bay that extend from B to C: at C the chalk begins, and reaches to the Needles. Here are seen the projections on the chalk cliff like buttresses. The distance, over C, is Freshwater down. D is the Lighthouse. Under F, G, H, are the three detached masses of chalk called the Needles. At E, is the perforation, or natural arch, in the extremity of the cliff. See pages 157, 163.

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PLATE XVIII. *Culver Cliff from the Sea, I. W.* T. W. del. P. 120 ✓

THIS view presents a complete section of the middle range of chalk hills which extends from the Needles to the Culver. In it the dip of the chalk beds may be distinctly seen by the flints. On the right hand, in the distance, are the clay cliffs in White Cliff bay. On the side of the chalk adjoining to it, large flakes or portions of the beds of chalk frequently slide down, the lower part being undermined by the sea. This part of the shore is therefore more covered with fragments than the left hand or south side, which is worn into caverns like those at Freshwater gate. The distance, on the left of the view, is the bottom of Sandown bay. This promontory is in many parts extremely picturesque and elegant in its form, which, however, changes at every instant, according to the motion of the vessel; a circumstance, which, like most other views from the sea, renders it difficult to delineate. The present point was chosen rather with a view to shew the real dip of the strata, than as the most picturesque. See page 120.

PLATE XIX. No. 1. *Sandown Bay and Culver Cliff, from the south side near Shanklin, I. of W.* T. W. del. P. 121 ✓

THIS view is drawn from the top of the ferruginous sand cliffs a little way to the north of Shanklin chine. The chalk promontory under A, is the Culver cliff, the east front of which is seen in the last plate. This side of the cliff next the bay exhibits a section of the series of beds from the flinty chalk to the ferruginous sand alluded to page 121. The east end of the promontory consists wholly of the chalk with flints. On sailing along the bottom of this side of the cliff, the flints soon disappear, and somewhere under B, the chalk without flints comes up, and the strata are seen rising to the west. Under this is the chalk marl, which is distinguished from the last by its splitting and shivering. Next follows the green sandstone, which is here chiefly of the whitish sort called firestone, and at a distance is not distinguishable from the chalk; the part of the cliff under C consists of it. The very dark cliff under D is the blue marl, which is strongly contrasted with the latter; the cliffs of chalk and green sand stone are quite perpendicular, but the blue marl forms only very steep slopes, as this stratum continually pulverizes and falls, so that it is easy to walk up in the hollows. The very deep red cliff, under E, is that known by the name of *Red cliff*, and consists of silicious sand, often strongly cemented with oxid of iron, alternating with yellow sand and black shale. These cliffs are quite perpendicular, and large masses of them continually fall, from the shivery nature of the shale. Some parts of them, however, are very firm; they extend to the bottom of the bay as far as F, where they lower entirely, and are succeeded by the flat beach of

Sandown level. In this low part of Red cliff, thin strata of shelly limestone are seen, strongly resembling the Purbeck series, or, perhaps, agreeing with those of Battle in Sussex. Under **G**, on the beach, is Sandown fort, where some troops are kept; below **H** is a small inn; **I** is the house inhabited by the late Mr. Wilkes. Under **K**, is seen a dark red cliff corresponding to that on the other side of the flat beach; it is, indeed, part of the same stratum, although it dips in a contrary direction; over this is placed the barracks. Yaverland lies concealed among the trees under **F**, and the hill above is Bembridge down. The beach, which appears to have given the name to this extensive and beautiful bay, affords a pleasant walk, but in the middle it is now entirely covered with shingles. See pages 121, 122.

No. 2. *Sandown Bay and Dunnose Head from the Fort.* T. W. del.

THIS view, looking to the south, exhibits the other side of the bay. Under **A**, is the inn seen in the last plate under **N**; **B** shews the ferruginous sand cliffs with the barracks over them. The long range of perpendicular cliffs beyond is a continuation of the same series, and the gap, seen under **C**, is Shanklin chine. Under **D**, is the high cliff at Luccomb; and beyond, under **E**, is seen Dunnose head just opening. The road to the Undercliff lies through the beautiful wood above these cliffs, and is backed by Shanklin down. See page 123.

No. 3. *Alum Bay and Headen Hill from the Needles.* T. W. del.

THIS view was drawn from the same station as Plate XXV, and formed part of the same sketch, which was divided into two for the convenience of publication. The brightness of the colours of the vertical strata in the centre may at first appear extravagant, but they do not exceed that of the original. No where in this country certainly is there to be seen an instance of strata so highly coloured, but when we find that they are composed of substances so widely different in tint, as the purest white sand, coal, bluish black and deep red clay, together with ochres of all kinds, we are less surprised at the appearance they exhibit. The high rock in the right hand corner, under **A**, is a small part of one of the Needles. Under **B**, is the end of the long line of chalk cliff, which is here much foreshortened and partly hid. Between this and the deep red clay under **B**, is a narrow chasm, which one may walk up in very dry weather, but which in winter is filled with the wet clay and marl which runs down and covers the beach. Some of the white marl is here seen at the bottom. Next to this, on the left under **C**, is the deep red bed of the plastic clay, which exactly corresponds to that next the chalk in Whitecliff bay; as also to the English plastic clay in other places, as at Reading; and I may add, to specimens of the French plastic clay lately brought over by our geologists. Adjoining to this is a thick bed

of black clay with septaria, mentioned page 212, and which I have classed as one of the beds of the plastic clay series. This bed does not appear to be extensively continuous, as I did not observe it in Whitecliff bay. I found but few fossils in it, and those not characteristic of the London clay, but rather agreeing with the Woolwich beds. From this to G, is a series of alternations of various substances, variously coloured sands, pipe clay, fuller's earth, ferruginous sand stone, &c. The perpendicular part, under F, is removed some way back. Under G, is one of the coal series, between which, and the other one at I, is a bed of pure white sand in which are several vertical layers of rounded and water-worn chalk flints, most of which are entirely decomposed, having become perfectly white and opaque throughout. The beds from this to K consist of red and white sand only. The ridge under K, which runs down to the beach, and which is immediately to the right of the dark stratum under L, is that which contains a considerable layer of large rounded flints also in a vertical position; they are imbedded in a sand intensely yellow. These flints are very deserving of notice, as they furnish the most decisive evidence respecting the original position of the whole of these strata. The dark stratum, under L, is the bed of black clay with green earth and septaria, which, from its numerous fossils, I consider as identical with the London clay. Here is the chasm where the path leads down to the beach, and which cuts off the distinct connection between the vertical strata and the highly curious and interesting series of beds that appear in a horizontal position to the left. The hill extending from L to N is called Headen; and the lowest of its strata, next to the beach, consists of sand, of which a small part immediately on the north of the chasm inclines about 45° , but which becomes soon horizontal. This horizontal part is beautifully white, and here are dug the pits from which the glass-houses are supplied. Over it is a bed of black clay without fossils. The stratum above this, which is curved at the end, and suddenly stops at the chasm, is that which I made out to be the lower freshwater formation, and consists of a series of thin beds of slightly indurated sand stone, marle, &c. with numerous fragments of freshwater shells. Upon it rests the upper marine formation, consisting of a thin bed of dark greenish and black marl and clay, with vast numbers of fossil marine shells in beautiful preservation. The whole of the beds forming the perpendicular cliffs above this compose the upper freshwater formation, distinguished by its numerous and exquisite specimens of fossil freshwater shells. These beds are unique in this country, but exactly resemble those of the basin of Paris. The greater part, if not the whole, of the hill above, seems to consist of flint gravel. The headland, under O, is part of Totland bay, where the same strata may be seen as at Headen. At P, is Warden point, the northern side of Colwell bay. Beyond, is the low coast towards Cowes. See Letter VI, and pages 211, 212.

PLATE XX. *Chalk Pit, Brading Down, I. W.* T. W. del. P. 123 ✓

THIS pit is remarkable, as affording an instance of the strata of chalk being quite vertical, in one spot. In the greatest part of the pit they are inclined a few degrees. The hills in the distance are Yaverland and Brading downs. See page 123. c

PLATE XXI. *Binnel Bay, below Wolverton, I. W.* T. W. del. P. 136 ✓

THIS is one of the numerous beautiful small bays along the southern shore of the island, which have been made by the sea wearing through the softer parts of the strata. In all those below the Undercliff, the strata are more or less inclined, generally dipping towards the land. This appears, in some cases, to have been occasioned by a general subsidence of the strata in the space between the Undercliff and the shore; in others, by a sliding down of portions of the strata from a higher level, often forming a succession of terraces. The rocks which compose the sides of the present bay appear to have sunk in a mass, the relative situations of the different beds not having been much disturbed. The rocks of a dark colour, which extend into the sea, are of the green sand stone; the white part, farther inland, is composed of chalk marl and chalk; and the line of junction with the former stratum is very distinctly marked. The bottom of this bay, like that of all the others on this shore, is covered with shingles, great quantities of which are thrown up at every tide. See page 136.

PLATE XXII. *Compton Bay, I. W.* T. W. del. P. 153 ✓

THIS view, looking to the east, is taken near the junction of the chalk with the inferior strata. The whole of the cliff consists of the ferruginous sand series; but, along the shore, there are many alternations of clay, white and black sand, with more or less iron and limestone. The horizontal unconformable capping to the cliffs on the right, consists of flint gravel, ten or twelve feet thick. The small building on the edge of the cliff is a barrack, on this side of which is a deep and gloomy chasm in the Ferruginous sand rock, called Compton Chine, which has been worn by a stream that comes down through it. The first point of land beyond this is Bull-face ledge; beyond which is Brook c. The whole of this shore is in a constant state of degradation, the sea wearing rapidly into the clay strata: in consequence of which, whole acres of land are frequently destroyed in the course of a winter. This coast is extremely dangerous on account of the numerous sunken rocks that lie in the sea, and which serve as geological meters of the waste of the land during a succession of many ages. See pages 152, 153.

PLATE XXIII. *Curved strata and Sand-pit in Headen Hill, Alum Bay, I. W.* P 159 ✓

T. W. del.

THIS view was sketched in the year 1811. At that time a pit was dug in the fine white sand under the curved stratum of soft calcareous rock that appears above it, and which afterwards proved to be the lower freshwater formation. But as these sand pits founder, and are filled up every winter, on revisiting the spot in the following summer, the place could scarcely be recognised. The whole of the curved part of the stratum over the sand-pit, as seen in the present sketch, had fallen down with the pit, and had disappeared; but as the new face presented a similar section, the facts remained the same; and as the etching was finished, it was not considered necessary to make a new one corresponding to its second appearance, since each succeeding winter produces such alterations in these cliffs, that any details of form observed one year, would be obliterated the next. When the first sketch was made, the stratum of black clay immediately under the curved stratum, was not so evident as at present; this has therefore been strengthened. The stratum to the right is the yellowish sand, dipping about 45° , adjoining to the vertical strata. Over the curved stratum is part of the upper marine marl that had slid down from above, and beyond is the upper freshwater formation, forming lofty cliffs, removed a little back. See page 159, 160.

PLATE XXIV. THIS sketch was made at the same time as the last, and is a nearer view of the curved part. It must be observed, that in the succeeding state of the cliff, the curvature appeared still greater than in the present sketch. The dark tint of the clay under it has also been added. See page 159. P 160 ✓

PLATE XXV. *Scratchell's Bay and the Needles, I. W.* T. W. del. P 163 ✓

THIS view is taken from a small rock that makes its appearance at low-water, a little to the north of the middle needle. It is seen in the foreground, and is the stump of the lofty spire of chalk which gave the name to these rocks, but which, being worn through by the sea, fell down in the year 1764. From this spot, on which it is seldom practicable to stand, the lofty perpendicular chalk cliffs present a distinct section of the middle range of hills in this island, and the dip of the strata may be accurately observed, being nearly vertical towards the north or left side, and leaning more and more towards the south side. To the left is Alum bay. A small part only of the clay cliffs are included in this plate, shewing their junction with the chalk. The coloured view, No. 3. Pl. XIX, of the whole of the cliffs of Alum bay and Headen, was drawn from the same station, and being on the same scale, may be

supposed joined to this view to complete the scene. The projecting pyramidal mass of chalk in this view is the eastern of the three Needles which are seen together in No. 3, Pl. XVII; beyond it, is to be observed a small part of the arch or perforation in the chalk, from which the Needle is quite detached; and in the right hand corner of the view is the eastern end of the middle Needle.

Scratchell's bay is formed by the Needles and the lofty cliff that stretches out to the right. In fine weather, it is easy to land in the middle part; and it is often visited on account of the vast quantities of wild fowl that frequent this place. The Lighthouse stands some way back, and cannot be seen from this station, although it may, a little farther out. From the Lighthouse it is easy to walk to the edge of the precipice, and one may even advance to the most projecting point; but this is rather dangerous, as the chalk here is worn to a sharp edge. The most magnificent view down into the bay is obtained by descending a very steep grassy slope to the edge of the south part of the cliff seen on the right hand of the view, from which the whole of the Needles may be seen: but no stranger should venture down to this spot without a guide, who may be procured from the Lighthouse.

Nothing can be more interesting, particularly to those who take pleasure in aquatic excursions, than to sail between and round the Needles. The wonderfully coloured cliffs of Alum bay, the lofty and towering chalk precipices of Scratchell's bay, of the most dazzling whiteness and the most elegant forms, the magnitude and singularity of the spiry insulated masses, which seem at every instant to be shifting their situations, and give a mazy perplexity to the place, the screaming noise of the aquatic birds, the agitation of the sea, and the rapidity of the tide, occasioning not unfrequently a slight degree of danger, all these circumstances combine to raise in the mind unusual emotions, and to give to the scene a character highly singular and even romantic. Scarcely a winter passes without one or more shipwrecks in this place, many vessels choosing to risk this passage to and from Portsmouth, instead of going round by St. Helen's. Two lighthouses are erected at Hurst castle, to direct the pilots to clear the Needles: but in hazy weather, fatal mistakes are too frequent. The account of this place and the shipwreck of the *Pomone*, are given in Letter VI.

PLATE XXVI. No. 1. *Handfast Point one mile off.* T. W. del. P 105-68 ✓

THIS is a section across the range of chalk hills that extend from this place to Lulworth, and which is a continuation of that in the Isle of Wight. On the right is Studland bay, and on the left is Swanwich bay. This chalk cliff may be seen distinctly from the Isle of Wight in fine weather. On arriving near to it, its stratification, which is singular, may be observed. The strata on the south side (on the left hand in the view) are quite vertical, as may be seen by the

layers of flints. The strata on the north side are horizontal, and at the junction between both, the horizontal beds turn upwards in a curve towards the vertical beds, and rest upon them. Along this line of cliff are several detached masses of chalk, which being harder than the rest, have resisted the effect of the sea: some of these are square, others round. Several large caverns have also been worn in the chalk. See from page 165 to 168.

No. 2. *Swanwich Bay from Peverel Point.* T. W. del.

THIS view looks to the north; and exhibits an oblique section of the range of chalk hills that extend from Handfast point through Corfe, and which compose the distance. A very oblique view is also seen of the east face of Handfast point, represented in the last plate. On examining these cliffs nearer, they are found to consist, at the eastern extremity, of the chalk with flints, under which lies the chalk without flints, the chalk marl, and the green sand; of the latter very little is seen. The lower and dark coloured cliffs at the bottom of the bay are formed of the ferruginous sand series, here containing hard silicious grit stone, clay, shale, &c. In the left corner is part of the town of Swanwich, famous for its quarries of Purbeck stone which forms the trade of this place. The quays are constantly covered with piles of stones prepared for paving and other purposes; and in the bay are generally vessels for conveying them to different parts of England. Peverel point in the foreground occasioned the shipwreck of the Danish fleet, consisting of 120 sail, in the year 877. See pages 169, 171.

No. 3. *Studland Bay, south side.* T. W. del.

THIS view looks to the south, and shews another section of the chalk hills. The strata here are nearly horizontal, dipping however a few degrees, and covered by others of clay and ferruginous grit stone. The former are overgrown by bushes, but the latter form considerable cliffs, above which is seen the village of Studland surrounded by trees. The bottom of this bay is a flat sand, and, except the entrance to Poole harbour, is so extremely shallow, that only flat bottomed boats can land. The south side of the bay is also filled with chalk and other rocks. See pages 168, 169.

PLATE XXVII. *Handfast Point, Dorsetshire.* T. W. del. P 166 ✓

THIS view exhibits one of the most curious geological phenomena yet observed in this country; and what is scarcely less extraordinary, it had hitherto entirely escaped observation. No one had yet noticed strata of chalk *quite* vertical; and the curved strata resting upon these, with the peculiar state of the flinty nodules, have not only no parallel in this island, but in the present state of our knowledge cannot be

accounted for in a satisfactory manner. This singular appearance occurs at the southern part of the east face of this promontory, and can be well seen only from the sea, which probably has been one reason why it had not yet been observed. The best way to see this cliff is to take a boat from Swanwich to Studland bay. In very fine weather it is easy to land on the small beach where the figures are placed; but the surf usually runs high here. See page 166.

PLATE XXVIII. *Insulated rocks, Handfast Point.* T. W. del. P. 165 ✓

IN passing along the east face of this headland, one is struck with the appearance of several caverns worn in the chalk, some of which are of great size, and also with the numerous indentations and vast buttresses that project from the cliff, giving the whole somewhat of a mural character. Several insulated columns of chalk also rise out of the sea, and appear as if composed of immense separate stones piled on each other; some of these are square, others are round. The loftiest of the square ones, seen in this view, at the northern corner of the cliff, is commonly known in the neighbourhood, and to mariners, by the name of Old Harry rock. The sea is generally of great depth very near to this cliff, but at this corner, there are many rocks which render it somewhat dangerous to pass, but which add to the picturesque effect of the place by the agitation of the sea which they occasion, the towering columns being always surrounded by breakers. See page 165 et seq.

PLATE XXIX. No. 1. *Swanwich Bay, from the north side.* T. W. del. P. 170 ✓

THIS view is taken from the foot of the chalk cliffs seen in Pl. XXVI. No. 2., the fragments of which compose the foreground; and here the remarkable state of the shattered flints and green sand, mentioned pages 166, 167, 169, are best examined. Under A, in the distance, is Peverel point from which Pl. XXVI. No. 2. was drawn. Under B, is seen part of the town of Swanwich which extends from the shore above a mile. In the hill over the town, and under the letters B, C, are the numerous stone quarries. See page 169.

No. 2. *Durlstone Bay.* T. W. del.

THIS bay is seen immediately on turning round Peverel point, and is remarkable on account of the curious contortions in the strata. In Peverel point, the strata dip to the north, hence they crop out on the south side, and form high cliffs where the several beds may be distinctly seen; such is the cliff in the right corner of this view under D. The mode of quarrying this stone is here represented; this is by making excavations and inserting slight props; in the course of time, these props

giving way, a part of the cliff falls down, and the fragments are worked by the masons into the forms proper for several purposes. In the rock on the foreground over which you walk, may be seen numerous fragments of fossil bone imbedded.

About the middle of the bay under C, the limestone becomes curiously bent and twisted in the most fantastical manner, evidently shewing the whole to have been at some period in a pliable state, and to have been subjected to elevation or subsidence accompanied by lateral pressure. The dip of the whole, however, is to the north, so that the mason recognises among the uppermost beds on the opposite side of the bay, those which are the lowest on this side. Under B the cliffs are composed of clay, a bed of which is inferior to the limestone series, and in this, in the quarries, masses of gypsum are found. At Durlstone head, under A, the Purbeck limestone again occurs in the same disturbed manner. See pages 171, 172.

PLATE XXX. *Contorted Strata, Durlstone Bay.* T. W. del. P 172 ✓

THIS sketch represents one of the numerous contortions to be seen in this bay. It is a circumstance worthy of remark, both here and in other parts of the Purbeck series, that the thinnest beds are generally the most bent. See page 172.

PLATE XXXI. *Breccia, Durlstone Head.* T. W. del. P 173 ✓

AT Durlstone head the Purbeck beds are not only bent and broken, but the fragments have been cemented together again into a singular sort of breccia. Large masses of this lie at the bottom of the cliff, and form a very curious subject for geological speculation. See page 173.

PLATE XXXII. No. 1. *Durlstone Head.* T. W. del. P 173 ✓

THE rock in the foreground of this sketch is a bituminous limestone, divided into septa by numerous veins of calcareous spar, and is the same bed as the uppermost of the oolite series at Tillywhim and the isle of Portland. The upper surface of it appears to have been subjected to some action that has worn it into hollows, previous to the placing on it of the Purbeck beds that now cover it. These Purbeck beds are violently contorted and broken, and again cemented into the breccia mentioned above. See page 173.

No. 2. *Windspit quarries.* T. W. del.

THESE quarries consist of a series of excavations in the face of the cliff between Tillywhim and St. Adhelm's head. The cliff is here of great height, and consists of an oolite, being the same formation as the isle of Portland. The stone worked here is somewhat harder than the Portland stone, but not quite so white. It is considered as rather more durable. It was in that part of the cliff covered by spray,

under B, where the Halsewell Indiaman struck, and the caverns seen there are those into which many of the unfortunate mariners and passengers climbed, yet without a chance of being saved, the cliff being quite perpendicular, or rather overhanging. The whole of the cliffs seen here consist of the same stratum, the dip being to the north-east. Under C is Tillywhim quarry. Under D is Durlstone head. Along the tops of the hills over these cliffs, the Purbeck beds crop out; and their connexion with the Portland series may be seen. See page 191.

PLATE XXXIII. *Tillywhim quarry.* T. W. del. P 174 ✓

THIS excavation in the oolite is celebrated in the neighbourhood, not only as furnishing an excellent building material, but for affording a delicious and cool retreat in the summer season, and is not unfrequently resorted to by parties who come to enjoy the sea breeze, as well as to admire the surrounding extraordinary and romantic scenery. The descent to it is by a path which winds through a deep valley strewn with stones, and bearing a very wild and desolate aspect. Steps are cut in the rock to facilitate the approach to the different terraces, which are formed by so many separate beds. That in which the excavation is represented, is the only one which is worked. The ceiling is supported by thick square pillars left at different distances. Round the rock to the east are other similar excavations, and towards the upper part of the cliff are prodigious beds of fossil oyster shells cemented by calcareous spar. The stratum under the quarry is also calcareous, but contains large nodules of chert lying in as regular a manner as flints do in chalk. The bed under this, on which the figures are placed, is a siliceo-calcareous sandstone. See page 174.

PLATE XXXIV. No. 1. *Clay pit near Newport.* T. W. del. P 24 ✓

JUST to the south of the town of Newport are some clay pits dug for brickmaking; the strata in which they are worked appear to be a continuation of the vertical beds of Alum bay, which no doubt extend across the island parallel to the chalk. The strata here, as at Alum and Whitecliff bays, are vertical, and consist also of thin alternations of clay and sand. Towards the top, they are bent back as if they had been disturbed when in a soft state. Similar appearances in Whitecliff bay are described page 24.

No. 2. *Chalk pit, Mount Joy.* T. W. del. P 208 ✓

THIS is an example of the mode in which the alluvium covers the vertical chalk of the middle range of hills. The ends of the strata appear to have been rounded, and the nodules of chalk and flint that are deposited in the hollows with sand have been water-worn. The whole is placed with a considerable degree of regularity, each succeeding deposit filling up more and more the original inequalities. See page 208.

EXPLANATION OF THE PLATES.

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PLATE XXXV. *Coast of Dorsetshire, and Portland Island, from Worth barrow.* P. 183 ✓

T. W. del.

THIS view, looking westward, is taken from the site of an ancient encampment on the edge of a precipice of great height, which terminates the range of chalk hills that extend from Handfast point through Corfe castle. From this point to the farthest chalk cliffs seen in the view at White Nore, they are more than half cut through by the sea: and in some places the sea has worn through the hills entirely, forming thus a number of small bays, the sides of which exhibit similar sections. The bay in the present view, included between the detached rocks in the sea and the foreground, is Worth barrow bay, the road down to which is just beyond the projecting point of chalk. The rocks in the sea, bounding the bay, are the Purbeck beds covering the oolite. The long hill in the middle of the view is called Swine's back, beyond which is West Lulworth. The isle of Portland is seen in the distance, joined to the main land by the Chesil bank, which is relieved light from the sea. Weymouth road is marked by the vessels at anchor. The upper part of the isle of Portland is precipitous; the lower part is a steep slope covered with grass. See page 183.

PLATE XXXVI. No. 1. *Durdle Cove with Barn Door.*

T. W. del. P. 184 ✓

THIS is one of the numerous small bays just mentioned, in the side of which may be seen a section of all the strata from the flinty chalk to the Portland. The first stratum is denoted by the vertical layers of flints in the left hand corner of the view; the advancing point in the middle is the green sand, between which and the chalk with flints, is the chalk without flints, and the chalk marl. The Portland is the stratum nearly vertical, and perforated in so remarkable a manner. The Purbeck strata are those numerous thin beds that lean upon the last; and the ferruginous sand is the part of the cliff the farthest removed. This bay is therefore not more curious from its picturesque natural arch, for which it is frequently visited by parties from Weymouth, than for its geological interest, containing in a small compass an epitome of a considerable portion of the series of English secondary strata. See page 194.

No. 2. *Arish Mell in Worth barrow Bay.*

T. W. del.

THIS view is taken from the beach at the middle of the bay where the road leads down from Lulworth castle; and its object is to shew more distinctly the profile of the hills that are cut in half by the sea, with the dip of the strata composing them. In the distance is the isle of Portland, and the same detached rocks as in Plate XXXV. See page 184.

PLATE XXXVII. *Coast of Dorsetshire from Flower barrow to St. Adhelm's Head.*

T. W. del. P 184 ✓

THIS view was drawn from the sea, looking to the east. In the left hand corner under A, is Arish mell and three detached rocks given in the last plate. Under B, on the top of the cliff, is the encampment called Flower barrow; and below it is Worth barrow bay, the east side of which is screened by the highly inclined low cliffs of ferruginous sand and clay under C, and the Purbeck and Portland strata under D. Behind this, and under E, is Gad cliff, where the Purbeck strata rise higher and form a capping to the hill. Under F, is the valley of Kimmeridge and its low dark cliffs. Under G, is the cliff called the Battery, on the other side of which is the valley of Encombe. Between G and H lies Chapman's pool. Under H and L, is St. Adhelm's head, the upper part of it is capped by the Portland stratum. See page 186.

No. 2. *Worth barrow Bay, looking east.* T. W. del.

THIS is a nearer view of part of Worth barrow bay. The cliffs of highly inclined strata, under A, are the same as are seen under C in the last plate. Gad cliff, under B, here rises in a very bold manner, and under it is a small and almost insular mass of the Purbeck strata resting on the Oolite which screens the east side of Worthbarrow bay. In the distance, to the left, is St. Adhelm's head. The distant hill, under A, is part of those above Kimmeridge. See page 187.

No. 3. *View from St. Adhelm's looking west.* T. W. del.

THE chalk cliff to the left, under A, is the Swine's back between Worth barrow bay and Lulworth Cove. The dark low rock, under B, is the eastern boundary of Worthbarrow bay. The cliff, with the curved capping, under C, is Gad cliff; the chalk cliff, the top only of which is seen beyond, is Flower barrow. The low dark cliffs between D and E, are the Kimmeridge strata, Kimmeridge bay being between two projecting points under Gad cliff; F is the high cliff called the battery, behind which, at G, is the valley of Encombe. Under G, is the same cliff, forming a part of St. Adhelm's head, as described under h, No. I. See page 188.

PLATE XXXVIII. *West Lulworth and Cove.* T. W. del. (FEHLT)

THIS view was chosen to shew the relative situation of the cove and the village which is placed in one of the interruptions of the chalk range that extends from Handfast point through Corfe castle to this coast. The hill seen just above the village is the end of the long hill called Swine's back, and which is half cut into by the cove, to which it presents a lofty precipitous chalk cliff which is not seen in this

view. In the distance is St. Adhelm's head; and nearer, just above the cove, is Gad cliff. The cove itself is deservedly celebrated. It is in nature peculiarly interesting, uniting great picturesque beauty with singularly instructive geological phenomena. It is one of those small bays which are so frequent on this coast, and which cut through the series of highly inclined strata; the opposite sides of the bay consequently correspond exactly.

The tranquil and sheltered appearance of this cove, and the numerous vessels, pleasure yachts, and fishing boats that are constantly seen in it, the loftiness of the chalk cliff in the center, with the uncommon position of the strata at the entrance, render it an object capable of exciting the greatest delight and surprise: nor are the chalk hills that environ the village undeserving of examination: their sides are cultivated and covered with corn, and the manner in which they are formed into terraces is curious. Several small and whimsically built houses have lately been erected near the cove. Under the projecting point, where the flag staff is placed, is the small cove called Stare cove, described at Plate XLIV. The foreground is the continuation of the same range of chalk hills that reaches as far as White Nore, four miles farther to the west. See page 185.

PLATE XXXIX. No. 1. *Lulworth Cove, west side.* T. W. del. P. 185 ✓

In this view is seen, on the right, a small part of the precipitous face of the chalk hill in the middle of the bay, and the *direction* of the beds of chalk may be seen at low water in the straight lined rocks at the foot of the cliff. The erect and curiously contorted strata under the flag staff are the Purbeck beds, in which, many of the layers of shale being washed out by the sea, those of limestone appear as great flakes with hollow spaces between. The Purbeck beds rest upon the oolite, which, in massy blocks, guards the entrance to the cove. One side of Stare cove is seen over the middle boat, and beyond, is the chalk cliff of Durdle cove. In the distance appears the isle of Portland. The foreground on the left is the east side of the cove, which corresponds to the west, as may be seen by the next view. See page 185.

No. 2. *Lulworth Cove, east side.* T. W. del.

In this view, on the left, again may be seen a small part of the chalk cliff, which in the middle is much higher. From that to the oolite at the entrance of the cove, may be traced the complete series of intermediate strata. The straight rocks in the sea near the foreground are portions of the Purbeck beds of this side, extending towards those on the opposite side. See page 185.

PLATE XL. *St. Adhelm's Head.* T. W. del. P 188 ✓

THIS bold promontory has a very imposing appearance in every direction. The present sketch is taken from the sea, looking to the north. The upper half of the cliff is composed of the oolite stratum, which is separated by immense fissures into square masses, many of which are almost detached, and just ready to fall; not many yards from the edge of the precipice, stands *St. Adhelm's chapel*, the top of which is just seen in the view. The whole of the base is covered with vast blocks that have tumbled down, and the rocks projecting into the water for a great way shew how much of this headland has been destroyed by the furious sea to which it is exposed. This destruction is much owing to the nature of the lower stratum of the cliff, which agrees with that at *Kimmeridge*, and consists chiefly of shale. To the left are the cliffs that extend to the *Windspit quarries*. See page 188.

PLATE XLI. *St. Adhelm's Chapel.* T. W. del. P 189 ✓

THIS small edifice, no accurate drawing of which has as yet been published, must be of considerable antiquity, although its date is not known; the door-way is in the Saxon style of architecture. It stands quite detached from every other building, and its situation on the top of the cliff is extremely exposed. Part of the roof had fallen in, but it has been lately repaired by the present proprietor. See page 189.

PLATE XLII. *St. Adhelm's Chapel, Plan, &c.* T. W. del. P 191 ✓

Fig. 1 represents the ground plan of *St. Adhelm's chapel*. It is exactly square, and without any windows except a small loop hole that looks to the sea. In the centre is a massy pier with pilasters that supports the roof.

Fig. 2. is the elevation of the north side, the perspective view of which is represented in Pl. XLI. The small circular basement to some superstructure on the top was discovered during the late repair. It might perhaps have served to support some sort of beacon.

Fig. 3 is the section of the chapel taken through the centre of the groins next the door. The arches are very low pointed, and composed of portions of circles having their centres a little above the springing of the arch, which gives it something of the Moorish character, a circumstance rare, though not unique, in Saxon architecture. The building is constructed of stone from the stratum on which it stands, and the workmanship is well executed.

Fig. 4 shews more at large the mouldings on the outside of the door.

Fig. 5, 6. Front and section of the circular pieces of *Kimmeridge coal* called *Coal money*. See page 191.

PLATE XLIII. *Interior of St. Adhelm's Chapel.*

T. W. del.

P. 191 ✓

THIS view represents the state of the building in 1812. It was then used as a sort of storehouse. See page 189.

PLATE XLIV. *Stare Cove.*

P. 193 ✓

THIS cove is the very reverse in its character to that of Lulworth. Instead of security and shelter, here all is violence and uproar. The strata of the rocks which form the farther end of it, are twisted and bent in the strangest manner: they are of the Purbeck limestone, but still more contorted than those of Lulworth. The south side of the cove, that on the right hand, is the Portland bed, on which the others rest: it is in a position nearly vertical, and is perforated in several places by large caverns through which the sea constantly pours with a tremendous noise, the bottom of the cove being covered with fragments, and the whole of the strata surrounding it exhibiting marks of the utmost disturbance and confusion. In this view, the head of Lulworth cove is seen on the right side of the centre, and to the left Gad cliff.

PLATE XLV. *Durdle Cove.*

T. W. del.

(FEHLT) X

THIS little bay is defended from the great violence of the sea, as the waves are somewhat broken by the arch and the line of rocks that runs across the entrance. These rocks are the last remains of the oolite stratum to be seen along the coast; the strata are quite vertical, as are also those of the chalk cliffs at the farthest side of the bay called Bats corner. This projecting point is perforated by a small arch, and a column of chalk rises out of the sea near to it.

The reflection from the chalk cliffs renders this place intensely hot in the early part of the day, but when the sun has got round sufficiently to throw them into shadow, the appearance of the bay is enchantingly still; the water is deep and extremely clear; and the variety in the strata surrounding it, the glittering purity of the chalk, the grave and massy Portland, the gaiety of the colours in the bright red and yellow ochres that are found in the sides, with the singular position of the strata, and the magnificent natural arch, with the cleanness of the pebbly beach, give it altogether so interesting an aspect, as will always repay the trouble of visiting it. The isle of Portland and Weymouth are seen in the distance. One caution may not be altogether useless. At low water the shingles extend round Bats corner, and the visitor may be tempted to extend his walk to some distance under the cliff, without having a boat in waiting: but as it is quite impossible to get up the cliff beyond that place, should he remain till the tide comes a good deal up, he will be locked in by the sea at Bat, and will experience great danger. See page 195.

PLATE XLVI. No. 1. *Bats Corner, &c. Coast of Dorsetshire.* T. W. del. P 195 ✓

THIS view represents a part of the coast where the strata of chalk are in a very unusual position. The small projecting point in the distance under A, to the right, is the west side of Lulworth cove. The chalk cliff under B has the strata very highly inclined. The dark coloured point, under C, is the east side of Barn door cove, shewing the profile only of the arch: the west side of this cove, Bats corner, is seen under D, where the flints in the chalk are quite vertical. A small opening is seen through this projecting point, and a column of chalk in the sea. At this place the lines of the flints begin to curve, which they do more and more, till they form the quarter of a circle; the curves then become flatter at the lower part, and gradually approach to a horizontal line. This curious change of the lines of the flints, from the vertical to the horizontal position, through the medium of various curves, can only be accounted for, by supposing that this cliff exhibits a portion of the chalk stratum that has been twisted, so that one part of it assumed the vertical, while the other retained its horizontal position. This place is much resorted to by shooting parties. See page 195.

No. 2. *White Nore, Dorsetshire.* T. W. del.

THE right hand of this view joins very nearly to the left hand of No. 1, and is a continuation of the same coast to the west. Under B is the fissure or fault in the strata filled up with gravel, from whence the strata rise to the north west; they soon become again nearly horizontal at C, under which place the green sand and the inferior strata make their appearance. These latter strata then usurp the place of the chalk, which disappears entirely at D. See p. 196.

No. 3. *Coast of Dorsetshire from Bats Corner to Weymouth.* T. W. del.

THIS is a general view of the coast from Bat's corner to Weymouth, taken from the sea near the Isle of Portland. From A to B includes the subjects of the two former plates. The whole of the coast, from B to Weymouth, which is under C, is composed of strata lower than the chalk. The hills in the distance are the chalk downs which extend from Chaldon to Dorchester. See page 196.

PLATE XLVII. *Theoretical Sections.* T. W. del. P 201 ✓

THE figures on this plate are explanatory of theoretical opinions respecting the singular position of the chalk in the country described in the foregoing plates. See pages 201, 204, 219.

PLATE XLVIII. *Map of the Isle of Wight.* T. W. del.

FRONT ✓

THIS map not having been constructed from trigonometrical survey, cannot pretend to the same accuracy in the several points, nor in the details of the hills, as if it had. It has however been compiled from the best materials that were accessible, and the chief advantage it possesses is that of presenting the geological features of the island with greater distinctness than has yet been shewn. The great superiority in height of the chalk down over the other hills has been expressed, and the manner in which these downs have been worn by the sea, thus forming lofty chalk cliffs, has been particularly distinguished. Instead of crowding the map with all the places and roads in the island, the principal ones only have been inserted, that the actual surface of the country might be obscured as little as possible.

PLATE XLIX. *Map of the Coast of Dorsetshire, from Handfast point to the Isle of Portland,* T. W. del.

END ✓

THE same observations apply to this map as to the last.

PLATE L. *Geological Map and Sections of the Isle of Wight, with the adjacent parts of Hampshire and Dorsetshire* T. W. del.

END ✓

IN this map, the strata on the surface, or rather, that would be on the surface if the alluvium were entirely removed, are expressed by different colours; a key to which is given at the side.

Fig. 1. Section of the Isle of Purbeck on the line AB.

Fig. 2. Section of the Isle of Wight on the line CD.

Fig. 3. Section of the Isle of Wight on the line EF.

These sections are drawn to a much larger scale than the maps, but the lengths and heights have been laid down from the same scale, a method which should always, if possible, be adopted in geological sections, as the only one calculated to convey accurate ideas. Of these sections, the same may be said as of the maps; that not having been constructed by the actual measurement of every part, a tolerably near approximation is all that has been possible: but it is hoped that the errors are not so great as to affect the general geological deductions, and that they are sufficiently explicit to shew the relative situations of the strata, the colours of which correspond to those of the maps.

REMARKS ON THE ...

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