EXPLANATION OF THE PLATE.

Fig. 1. Is a sketch of the Chalk Cliffs between Deal and Folkstone. It must however, be noticed that in this sketch, the height of the cliffs is too great in proportion to their length, the dip of the strata being somewhat less than one degree. If reduced to their actual proportionate height, it would scarcely exceed one-fourth that of the sketch.

Fig. 2. Is a view of the Chalk Cliffs forming Cape Blanc Nez on the coast of France, opposite to Dover. It will be observed that the beds of Fig. 1 & 2 seem to dip in opposite directions, but if the spectator be supposed to be on the sea between the two coasts, he will look nearly north while viewing the Cliffs near Dover, but nearly south when viewing Cape Blanc Nez. The dip in both is towards the east.

Fig. 3. Represents an Inoceramus from the Chalk with few flints near Dover; it is described at page 44, by Mr. Parkinson, who has named it Inoceramus Lamarckii.

Figs. 4. & 5. Are Inocerami from the blue marle near Folkstone; they are described by Mr. Parkinson at page 48, as Inoceramus concentricus, and Inoceramus sulcatus.
Descriptions of some new Fossil Encrini and Pentacrini, lately discovered in the neighbourhood of Bristol.

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[From the Transactions of the Geological Society.]

THE fossils represented in the accompanying drawings are so beautiful in their forms, and add so much to the history of the encrini, inasmuch as the greater part of them are of new species, that I have thought the figures of them would prove interesting to the Geological Society. The principal part of them has been discovered in the limestone beds on the river Avon near to Bristol, which pass from thence in a direction a little to the south of west to the sea at Clevedon point, at which latter place remains of this class are abundant. One of the beds near Clifton, called the black rock, contains parts of stems of encrini in great quantity, and sometimes white circular rings of calcareous spar. It was, I believe, first suspected by Mr. Brackenridge and Mr. Miller, of Bristol, that these latter were the hollow heads of the same animals. On polishing several specimens cut in different directions, there appeared no reason to doubt the correctness of this supposition, although the compactness of the stone rendered it impossible to extricate them.
A polished specimen of the limestone of the Black Rock containing one of these supposed heads, is represented in plate 2, fig. 1.

After much research, Mr. Benton found in a crevice in these beds a specimen of one of these heads, which is now in Mr. Miller's collection. This discovery proved the truth of the supposition, as it was evidently the section of a similar body which caused the marks before mentioned in the limestone. In these crevices, clay was found in which were many detached plates of the upper parts of encrini, apparently of different species, as well as portions of stems or trochitæ, as they are usually called; among the latter were several of different species both cylindrical and pentagonal. Since that time, many gentlemen of this vicinity have sought with much activity for similar objects. Their activity has been rewarded with considerable success, as the accompanying drawings will shew. I will now proceed to describe these objects, noticing the spot where each specimen was found.

Plate 2, Fig. 2.

This specimen was discovered by me in the month of August, 1816, in a shelf of decomposing limestone, near Woodspring Abbey Farm, in the neighbourhood of Whorle in Somersetshire. It is to be regretted that these bodies are generally much broken and injured, and it is very rarely that one is found as perfect as the present specimen. Its plates are of a lightish colour, and the limestone that fills it is much harder than that in which it was imbedded.

Plate 2, Fig. 3.

Is another of the same species, from the same limestone at Woodspring. This species has probably some resemblance in its nature
to that in the British Museum, which has been called by Mr. Par-kinson, the Nave Encrinus (see Organic Remains, vol. 2, pl. 17 fig. 3,) as in this specimen are seen the double openings for the branching arms.

*Plate 2, Fig. 4.*

In November, 1816, Mr. Page discovered the specimen which is here represented in a fragment of coarse reddish limestone, containing many remains of encrini, at Burrington Combe, twelve miles from Bristol. The specimen is much weather-worn, but appears to have a considerable resemblance to the nave encrinus before noticed. The drawing is of the natural size.

*Plate 2, Fig. 5 and 6*

Is a fragment exhibiting the interior of one of the same species as the preceding, and from the same place; it was with much diffi-culty cleared from the limestone in which it was imbedded. A magnified representation of the arrangement of the plates is given, fig. 6. These hexagonal marks are darker than the rest of the specimen.

*Plate 2, Fig. 7*

Is another head, found also by Mr. Page, at the same place. It is particularly interesting, as shewing one of the passages into the branching arms which is perfectly smooth, as well as the whole of the cavity. There is also a small passage entering the stem, which is not visible in the drawing. This specimen differs from the pre-ceding, in wanting the dark hexagonal figures. The size of the drawing is that of the specimen.
Plate 2, Fig. 8.

Found at Burrington Combe, in 1817. This drawing is a little larger than the specimen, which is filled with white calcareous spar. The specimen first found, as mentioned page 2, was nearly allied to this, though not of the same species.

Plate 3, Fig. 1.

This fine encrinus was found by Mr. W. Morgan, in Clevedon Bay, near Walton Castle, Somersetshire, in the autumn of 1817. It is, I believe, of an entirely new species, and shews both the stem and the branching arms in connexion, the arms being nearly closed together. The lower edges of the first plates are crenated in a manner different from any I have hitherto seen.

It was discovered in one of the sandy beds that alternate with the limestone at Clevedon Bay, and when first discovered, only three or four joints of the stem were visible, the rest being concealed by the sandstone. By care and perseverance it has been cleared to the extent represented in the drawing, which is a very little larger than the specimen.

Plate 3, Fig. 2.

This remarkably large specimen was found by Mr. John Morgan, partially exposed and attached to the underside of a bed in the sandstone. Considerable difficulty occurred in obtaining it, as we were obliged to break away more than a ton weight of stone before it could be safely removed from the rock. Parts of stems of this species are common in this rock, but it is the first instance I am aware of in which the upper part has been found; it is therefore highly interesting, as adding to the history of this species.
Encrini and Pentacrini discovered near Bristol.

Plate 4, Fig. 1 and 2.

These two figures represent the two sides of a specimen found by me in September, 1816, near to Clevedon; and in order to make out its detail with accuracy, I have made the drawings somewhat larger than the size of the original. It was found nearly buried in a mass of very hard limestone of a grey colour.

Plate 4, Fig. 3

Is a considerable fragment of another species, a little larger than the original, which I have cleared as well as I could from a silicified stone rolled on the beach. It is interesting, as having the stem.

Plate 4, Fig. 4 and 5.

This specimen exhibits the upper joints of the stem of a penta-

Plate 4, Fig. 6 and 7.

This specimen was found in a magnesian sandstone in Clevedon Bay, by Mr. W. Morgan, in August, 1816. Fig. 7 represents the natural size.

Plate 4, Fig. 8, 9, 10, and 11.

This beautiful specimen was found at the same time and place as the preceding, only a very small part of it being visible. Having by much care and labour succeeded in developing it, I immediately made the accompanying drawing. The specimen had so much symmetry and was so beautifully perfect in all its parts, as to appear artificially carved. Unfortunately Mr. Morgan has since injured it
by immersing it in dilute muriatic acid. Fig. 8 is a side view; Fig. 9 the upper part; Fig. 10 the lower, where the stem, if it had one, must have been attached. Fig. 11 the natural size. None of the joints of the arms are to be seen in this specimen, but one which I have in my own collection, and which I believe to be of the same species, exhibits part of three arms which ramify in the manner usual with pentacrini. This specimen is however too much weather-worn to be engraved.

Plate 4, Fig. 12

Represents a specimen on which are portions of the upper parts of two pentacrini of a scarce species, one of them having a part of the stem. This was also found in the magnesian sandstone at Clevedon Bay.

Plate 5, Fig. 1.

This singular specimen, which I consider to be a species of encrinus, was found by Mr. W. Morgan in August, 1816, in one of the upper strata of inclined gritty limestone, forming the east end of the ridge of rocks in Woodspring bay, near Whorle, in the Bristol Channel. Many fragments and single plates were found at the same time, but no other specimen that shewed the general form.

On examining this figure it will be observed that there are three lines in which the plates are set in a regular vertical order on each other, and diminishing in size as they ascend. The other plates are differently arranged in respect to each other, and fill up the intermediate spaces, the number of the intermediate plates in each row increasing as they ascend. This figure exhibits about half of the cup-like form of the animal, and it appears that there must be two more lines of the vertically-arranged plates in the concealed portion. The edges of the plates are deeply serrated. The figure is about twice the natural size.
Encrini and Pentacrinini discovered near Bristol.

Plate 5, Fig. 2, and 3

Are two views of a specimen in my collection which is allied to the preceding, and was found in the upper part of the same rock, near the soil. It is somewhat decomposed, but is curious from the different sizes of the plates on the two sides.

Plate 5, Fig. 4, 5, 6, and 7.

This is the part of a pentacrinus, which is situated immediately above the columnar stem; its size is that of a common pea; and from fig. 4 it will be seen that the stem must be unusually large in proportion. It was taken from an ochreous limestone in a state of decomposition, at Stinchcombe, in Gloucestershire, by Mr. Shrapnell of Berkeley.

Plate 5, Fig. 8, 9, and 10.

Figure 8 represents a plate of an encrinus, of which several have been collected from the weather-worn sides of the black rock at Clifton, and they are often found in the clays that fill up the crevices of its strata; but hitherto no specimen has been found in this neighbourhood in a more perfect state. In the British Museum there is one which has several plates connected together in their places, and forming the lower part of the body, whence the arms spring. The two following figures, No. 9 and 10, are from the Ashmole collection at Oxford; Professor Buckland having allowed me to take drawings of them for the better illustration of this subject. Fig. 9, is a plate resembling those found at Clifton, but having the first joint of the arm attached to it. Fig. 10 is from a more perfect specimen. The locality of these is not known.
Plate 5, Fig. 11.

This specimen is from the magnesian limestone at Clevedon, and is remarkable for the appendages which arise from different parts of the stem. These are different in the order of their insertion from those which are seen in the recent pentacrinus, the latter being in regular verticillations. The manner of their insertion is also different, as they appear to be connected with more than one joint of the stem. In our present state of ignorance as to the nature of these bodies, it is desirable to collect all the materials we can, in the hope of being at length able to explain the use and nature of the various parts. At present I am unable to offer any conjecture respecting these side arms.

Plate 5, Fig. 12

Is another specimen from the same rock, consisting of several portions of stems variously bent. These occur very frequently, but we have not, as yet, satisfactorily ascertained to what species they belong.

Plate 5, Fig. 13.

I believe this to be the lower part, or attachment of the fine species, represented plate 3, fig. 1, near to which it was found.
EXPLANATION OF THE PLATES.

PLATES 6, 7, 8, 9, 10, 11, 12, 13, 14, 15.

PLATE 6 contains,

No. 1. View of the small range of hills near Kildare, taken from the Curragh, about 1½ mile from the town. The range is elevated from 200 to 300 feet above the surrounding country.

No. 2. Circular view from the summit of Dunmurry hill, one of the above mentioned range, from which may be perceived a great part of the field of inquiry; the whole range of mountains on the east being presented to observation, from the vicinity of Dublin on the north to Brandon hill on the south, in which direction the prospect is terminated by the coal country, and on the west by the Slieve Bloom mountains; while to the north the view expands over the flat central part of Ireland, interrupted in that quarter only by Croghan hill in the King's county, by the straggling hills of Westmeath, and the more extended range of the Cavan hills beyond.

PLATE 7 contains,

No. 3. A view taken from the western borders of the Killenaule coal district, above Littlefield, extending from the Slieve Bloom on the north, through the Devil's Bit, to the Bilboa mountains on the south; and more immediately south of the spectator are seen the last portions of the Killenaule coal district, spreading towards Cashel, with a part of the Gaultees mountains beyond.

No. 4. A view from the northern brow of Pallis hill, in the county of Limerick, exhibiting the Bilboa mountains on the north, with the mountains of the county of Clare beyond the Shannon on the west, and Slievenaman on the east.

No. 5. A view from the south-eastern side of the same hill, of the noble range of the Gaultees mountains, stretching from Caher on the east towards Charleville on the west; the fore ground being partly occupied by the trap range of Knock Rua, Knock Dirk, and Kilteely hills.
EXPLANATION OF THE PLATES.

No. 6. A view taken from the south-eastern face of the Gaultree mountains, above Caher, which extends from Slievenaman on the north of the Suire, through the picturesque ranges of the Monavoullagh and Knockmildown mountains on the south, which occupy the tract situated between the rivers Suire and Blackwater.

Plate 8 contains,

No. 7. A circular view from the summit of Cronebane hill, which extends to Blackstairs on the south, to Djouce and Great Sugar Loaf on the north, to Lugnaquilla on the west, and to the sea on the east.

No. 8. A view taken from the southern brow of the hill on the eastern side of the Scalp, extending from Shank hill and the sea on the east, through Bray Head, the two Sugar Loaves, and Djouce mountain to Glencree, and Glen-cullen on the west.

No. 9. A view taken from the northern peak of Little Sugar Loaf, extending from Maulin hill on the south-west, through Glencree, Glen-cullen, the Scalp, and Shank hill to Dalkey Head on the north-east, with the bay of Dublin, Howth, and part of the island of Lambay beyond them to the north.

Plate 9 contains,

No. 10. A view of the northern aspect of the mountains near Dublin, taken from the Grand Canal, near the Twelfth Lock.

No. 11, No. 12, No. 13, and No. 14. Separate views of Howth, and of the isles of Lambay, and Ireland's Eye.

Plate 10 contains,

No. 15. A view taken from Eagle hill, of the mountain range extending westward from Lugnaquilla.

No. 16. A view of Cadeen from Kilrancla hill.

No. 17. A view of the mountains around the glen of Imale, taken from Bushfield, nearly in its center.

No. 18. A circular view from Coolattin hill, in the barony of Shillelagh.
EXPLANATION OF THE PLATES.

PLATE 11.
A Map, in illustration of the geology of Croghan Kinsbela mountain, and of the works which were carried on there, under the auspices of Government.

PLATE 12.
Plan and Sections of the Copper Mines in Cronebane and Tigrory, in elucidation of the metalliferous relations of that district.

PLATE 13 contains,
Views copied from nature.

Fig. 1. 2. 3. & 4. Beds and veins of granite in mica-slate.
Fig. 5. Fragments of mica-slate in a metalliferous vein.
Fig. 6. & 7. Horizontal plan of contemporaneous veins in transition greywacké.
Fig. 8. Vertical section of contemporaneous veins in the same rock.
Fig. 9. & 10. Pebbles of limestone in transition greywacké slate.
Fig. 11. & 12. Veins of breccia, traversing floetz limestone and slate-clay.

PLATE 14 contains,
sections.
No. 1. Through the Castlecomer coal district, from the Nore on the west to the Barrow on the east.
No. 2. From the Barrow on the west to the summit of Lugnaquilla on the east.
No. 3. From the summit of Lugnaquilla on the west, to the sea at Arklow on the east.

In the last two sections, mountains are in some cases projected on the line of section, which stand not immediately in the line.

No. 4. Through the Killenaule coal district.

PLATE 15.
Map of the Tract.
EXPLANATION OF THE PLATES.

PLATE 19.

Fig. 1. Basaltic dykes in the Isle of Mull, near Carsaig.
Fig. 2. Represents Stona Buach, or the promontory of the Goats, Isle of Mull.
   The upper part consists of columnar basalt, which rests on irregular strata of limestone and green sandstone.

PLATE 20.

Natural perforations in basaltic rocks in the Isle of Mull. The nearest is called Bidda vich Re Lochlin, or the promontory of the son of the King of Norway. It is pierced through a detached rock, and the arch is about 70 feet high; on the top of the rock is a row of apparently single basaltic columns, as if it were a columnar dyke. Two of these columns stand by themselves. The base of this rock is green sand in coarse grains. The farthest perforation is called Uam-will, or the pierced Cave. It is about 60 feet high, and between 50 and 60 feet broad. The rock which it pierces is basalt, resting on green sand. Over the arch is a stratum of basaltic columns.

PLATE 21.

This represents the view looking out from the most distant of the arched rocks in Plate 21.
EXPLANATION OF THE PLATES.

PLATE 22.

*Fig. 1.* Represents a new Pentacrinus found lately at Lyme Regis, considerably resembling that called by Mr. Parkinson the Briarean.

*Fig. 2.* Is the part from which the arms spring.

*Fig. 3.* Represents the lower part of the stem, which is so nearly circular, that at first it was thought to be an encrinus.

*Fig. 4.* Part of the stem towards the head, exhibiting decidedly the pentagonal form.

PLATE 23.

*Fig. 1.* A new and peculiar species of Encrinus.

*Fig. 2, 3, 4, & 5.* Represent a separated Pelvis belonging to the Briarean Pentacrinus.

PLATE 24.

Map of part of the course of the brook Pulcovca, near Petersburgh.

PLATE 25.

Views on the brook Pulcovca, coloured geologically.

PLATE 26.

*Fig. 1.* Landslip of the dark green clay on the right bank of the Pulcovca, marked *a* in the plan and section.

*Fig. 2.* View looking down the Pulcovca. *x* and *y* are dykes in the limestone rock, filled with diluvium. These plates represent the natural colours of the rocks.

PLATE 27.

*Fig. 1.* View of the Pulcovca coloured geologically. The colours correspond with those in plate 25.

*Fig. 2 & 3.* Two Sections of the Pulcovca outlier.

*Fig. 4.* Section of the Strata along the course of the Pulcovca, to explain the relative situation of the disturbed beds.
EXPLANATION OF THE PLATES.

PLATE 28.

Map of the environs of St. Petersburg.

PLATE 29.

Fig. 1. Section of the heights of Crasno Celo, near St. Petersburg, from N.E. to S.W.

Fig. 2. Section of the hills on the east side of the Ligovca.

Fig. 3. Clay veins on the Coirovca.

Fig. 4. Represents a Section of the country on the right bank of the Neva.

PLATE 30.

The upper part of the valley of the Ligovca, coloured geologically.

PLATE 31.

Fig. 1. View near Gertova on the right bank of the Tosna.

PLATE 35.

Map and Sections of the Isle of Man, coloured geologically.

Fig. 1. represents a Section of a bed of greywacke occurring in clay-slate on the north part of Douglas Bay, perpendicular to the direction of the strata.

Fig. 2. is a Section of the same place parallel to the direction of the strata.

Fig. 3. Beds of greywacke intersecting the clay-slate at a quarry at Port Eshee.

Fig. 4. Trap dykes in the limestone between Pool-vash and Scarlet Point.

Fig. 5. represents a Section of a portion of gneiss near the Dun.

Fig. 6. is a Section from Pool-vash to Scarlet point.
EXPLANATION OF THE PLATES.

PLATE 40.

Osteology of the head of the Ichthyosaurus.

*Fig. 1 to 8.* Transverse sections of the left lower jaw, shewing its composition; figures 1 and 3, also take in the upper jaws.

*Fig. 9.* Side view of the head.

*Fig. 10.* Lower jaws seen from beneath.

*Fig. 11.* Head seen from above.

*Fig. 12.* Roof of the mouth.

PLATE 41.

*Fig. 1 to 11.* Vertebrae of the Plesiosaurus.

*Fig. 12 & 13.* Vertebrae of the Ichthyosaurus.

PLATE 42.

*Fig. 1 & 2.* Fragments of the paddle of the Plesiosaurus.

*Fig. 3.* Scapula, coracoid bones, humerus, radius and ulna, of the Plesiosaurus.

*Fig. 4.* Humerus, radius and ulna, seen in another point of view, with the carpal bones attached.

*Fig. 5.* The whole paddle conjecturally restored.

*Fig. 6.* One of the ribs.

All the figures, except 5, are half the size of the original.