EXPLANATION OF THE PLATES.

PLATES I. & II.
Illustrate Mr. Strangways' paper on the geology of Russia, Art. I. page 1, &c. of the present volume.

PLATE I.

Fig. 1. represents veins of hornblende in limestone, near the western extremity of the island of Pargas: described pages 3 and 4.

Fig. 2. Map of the falls of Msta, at the village of Ouglova, near Borovichy, in the Valday hills: pages 13, 14, 16.

Fig. 3. View from the hill of Simbirsk on the Volga, page 30—showing the relative situation of the white marl, sand, and black clay. The rocks in the distance are the white central limestone, forming the high steppe of Pallas, and marked H on the map, Plate II.

PLATE II.

A sketch of a geological map of European Russia. To facilitate reference, a letter is annexed to each colour in the table on the margin of the plate; and the several portions of the map in which the same rocks occur are denoted by corresponding letters as well as colours.

PLATES III. IV. V. VI. VII. & VIII.
Illustrate Mr. De la Beche's paper on the south coast of England, Art. II. page 40, &c.

PLATE III.

Fig. 1. represents the remains of a crustaceous animal, found in compact nodules of the green sand, in the vicinity of Lyme: p. 42.

Fig. 2. The back of a singular fossil crab, from the same place, found in the green sand: p. 42.

Figs. 3, 4, & 5. The Echinonáus lampas, a new species of Echinite, from the green sand near Lyme, mentioned page 42. Fig. 3. the upper surface: fig. 4. a side view: fig. 5. the under-side of the fossil.
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PLATE IV.

Figs. 1 & 2. Fossil bodies, which appear to have the external defensive organs of some fish, found in the lias near Lyme: p. 43.

Fig. 2. exhibits the alternate position of the teeth-like processes in two rows, seen in profile in fig. 1.

Fig. 3. A transverse section of fig. 1. at b.

Figs. 5, 6, 7, 8, 9 & 10. Fossil bodies resembling palates or teeth, found in the lias, near the fossil represented in figs. 1 & 2: figs. 4 & 5 are rare varieties: fig. 6 the most common.

PLATE V.

Figs. 1 & 2. The side and front views of a very rare fossil, which appears to belong to the same class with that represented in Plate IV. figs. 1 & 2.

Fig. 3. A fossil jaw with a triple row of teeth, from the lias of the neighbourhood of Lyme; in the collection of Colonel Birch.

Fig. 4. shows the position of the four rows of teeth in another specimen, similar to fig. 3; in the same collection.

PLATE VI.

Fig. 1. represents a specimen of the Dapæodium politum, described p. 45: the interior of the mouth is shown in fig. 2, and two of the teeth in fig. 3.

Fig. 4. The inner side of two contiguous scales of the Dapæodium politum, showing the acute process, which projects from each scale and fits into a corresponding depression in the adjoining one. These processes are not visible on the outside. —page 45.

PLATE VII.

Fig. 1. Another fossil fish from the lias near Lyme: p. 45.

Figs. 2 & 3. Fossil ferns, from the lias of Axminster in Devonshire, in the collection of Professor Buckland.—Drawn by Mr. Sowerby. Fig. 2. is from the white: fig. 3. from the blue lias.

PLATE VIII.

Sectional views of the coast of Dorset and Devon, from Bridport Harbour on the east, to Sidmouth on the west; with colours indicating the several rocks.

PLATES IX. X. & XI.

Illustrate Mr. De La Beche’s paper on the coast of France, Art. VI. p. 73, &c.

PLATE IX.

Figs. 1, 2, & 3. Sections, on the lines AB, CD, and EF, on the map, Plate XI. The
EXPLANATION OF THE PLATES.

The scale of horizontal distances is the same with that of the map; but that of the heights much greater. The colours denoting the rocks correspond with those of the map.

**Fig. 4.** An undescribed Ammonite, from the blue clay of the oolite formation at the Vaches Noires cliffs: pp. 77 and 78.—b. represents a portion of the edge.

**Fig. 5.** A specimen of the Hallirrhöe costata of Lamouroux, showing the interior structure; from the green sand of the Vaches Noires cliffs: p. 75.

**PLATE X.**

Sections of the coast of France, from Fecamp, in the department of the Seine Inferieure, to Grand Camp, in the department of Calvados: p. 73. The scale is considerably larger than that of the map, Plate XI. The colours indicating the rocks correspond with those in the map.

**PLATE XI.**

Geological map of portions of the departments of the Seine Inferieure, the Eure, Calvados, and La Manche. The colours correspond with those of the sections Plates IX. and X.

**PLATE XII.**

Illustrates Mr. Webster's paper on the Fresh-water Formation in Hordwell Cliff, &c. Article VII. p. 90.

**Fig. 1.** represents a section of the coast of Hampshire, from Hurst Castle to Muddiford. The scale of heights is greater than that of lengths.

**Fig. 2.** A Map of the coast of which fig. 1. is a section, together with a small part of the Isle of Wight.

**Fig. 3.** represents the magnified appearance of some fossil bodies found in the fresh-water formation at Hordwell: pp. 92, 93.

**Fig. 4.** The same bodies of their natural size.

**PLATES XIII. & XIV.**


**PLATE XIII.**

Map of the Valleys which intersect the coast of Dorset and Devon.—The N. W. angle, not being mentioned in the paper, is not coloured.
EXPLANATION OF THE PLATES.

PLATE XIV.

Fig. 1. Section of the coast of Dorset, from Lyme Regis to the Isle of Portland, as seen from Lyme Regis; showing the manner in which the valleys are intersected at the point where they are terminated by the present sea shore. It is probable that a considerable portion of this coast has been worn away by the sea, and that the small clay valleys or combes, which are now abruptly truncated at their termination, were originally continued with a gradual slope to the water's edge. The form of these cliffs and of those represented in fig. 2, as seen from a boat in passing along the coast, is represented in the sections by Mr. De la Beche, Plate VIII. of the present volume.

Fig. 2. Section of the coast of Devonshire, from Sidmouth to Beer-head. The first combe or dry valley, on the E. of Sidmouth, is abruptly truncated, like those represented in fig. 1.; the others terminate by a gradual slope in the sea. The line of junction of the green sand with the red marl is marked by the termination of inclosures and of fertile soil, exactly at the point where the green sand begins. The table lands that form the summits of these green sand hills are for the most part barren heaths, except where they are covered with diluvial gravel, or by a bed of unrolled chalk flints. This observation applies also to the green sand summits in fig. 1,—and to the table lands composed of the same stratum, which stretch inland from the coast to the flat summits of the Black Down hills,—in which this formation attains its highest elevation, overhanging with its escarpment the vale of Taunton.

PLATES XV. XVI. XVII. XVIII. XIX. XX. XXI. & XXII.

Illustrate the Rev. Mr. Conybeare's additional Notices on the fossil Genera Ichthyosaurus and Plesiosaurus, Article IX. p. 103.

General Letters of Reference.

Throughout the series of plates illustrating the former* and the present Memoirs on the genera Ichthyosaurus and Plesiosaurus, the same letters have been employed in reference to the several bones which compose the skeleton of the head; being those previously applied in a similar manner to the osteology of the Crocodile's head by M. Cuvier. It may be convenient to the reader to have these references at once under his eye: the author has therefore added the whole alphabetical series,—although some of the bones, designated by particular letters, are not visible in the present plates,—with the intention of continuing the same references in any future plates of the heads of other saurian animals; which will secure the double advantage of making the present list a complete index to the osteology of the head in the genera of this order, and of rendering any future table of reference unnecessary. The bones not

EXPLANATION OF THE PLATES.

visible in the present plates, are distinguished by an asterisk prefixed to the letters.

a. Intermaxillary bones.
b. Maxillary.

N.B. It would have been a far more convenient order to have introduced next to these bones, the nasals \( k k \), and the lachrymals \( i i \).
c. Jugal.

Bones visible only in the roof of the mouth.

* d. External pterygoids; not visible in the present Plates.

e. Palatal bones.

f. Internal pterygoidal processes.

* g. Bones considered by M. Cuvier as the great wings of the sphenoid. By instituting a comparison with other oviparous quadrupeds, I have become convinced that these correspond with the lamellar bones in the turtle united to the parietal; and that they are the same parts which are reduced to two cylindrical columns in the lacertæ: I should therefore be inclined to name them lateral-parietals. They are not visible in the specimens now represented.

Dismemberments of the frontal bone.

H. Middle frontal.
h. Anterior frontals.
h'. Posterior frontals.

N.B. These bones, in the Ichthyosaurus, send a long process forwards beneath the anterior frontals,—which emerges thence and re-appears in front of the upper part of the orbit, and might without due care be mistaken for a separate bone. See Plate XVII.

h''. Post orbital frontal process.

\*i. Lachrymals, or Ossa unguis. These would have been more properly placed next to \( b \), the maxillaries.

\*l. This letter is not appropriated by M. Cuvier. I shall hereafter apply it to the Os petrosum; which in all oviparous quadrupeds, as indeed in some Mammalia (e. g. the ruminantia), is a separate bone.

m. Parietal. I should consider this as the middle parietal, and (as I have before observed) the bones marked \( g \) as lateral parietals.

Dismemberments of the temporal bone.

n. Squamoso-zygomatic portion.
n'. Mastoid process,—connected with the preceding in the crocodile; but in most other oviparous quadrupeds forming a separate bone.

o. Tympanal bone, or Os quadratum.

N.B. The Os petrosum, to which I have assigned the vacant letter \( *l \), ought here to follow.

p. A bone connecting the tympanal bone and the posterior part of the jugal bone; peculiar, I believe, to the crocodile.
EXPLANATION OF THE PLATES.

Dismemberments of the occipital bone.

\[
\begin{align*}
q &. \text{ Superior occipital.} \\
r &. \text{ Inferior occipital.} \\
s &. \text{ Lateral occipitals.} \\
t &. \text{ Basilar portion of the sphenoid.} \\
t' &. \text{ Process corresponding to the sella turcica.} \\
\end{align*}
\]

Not visible in these specimens.

N.B. M. Cuvier seems (for his notice is very slight) to have considered these last two bones, together with the internal pterygoid, and the bones marked \( g \), as forming in the crocodile a single and united sphenoid. But in the common Nilotic crocodile they are certainly distinct bones, the sutures between them being very evident. These sutures are clearly exhibited in a specimen in my possession, and may be traced in the figure given by Scarpa (de Auditu); they closely correspond to the similar parts in the turtle.—See Bojani, Anatome Testudinis.

Bones of the lower jaw.

\[
\begin{align*}
u &. \text{ Dental.} \\
v &. \text{ Angular.} \\
x &. \text{ Coronoid.} \\
y &. \text{ Articular.} \\
\delta &. \text{ Opercular.} \\
\end{align*}
\]

The letters above given, having been adopted merely for the convenience of reference to M. Cuvier’s plates of the osteology of the crocodile, are not systematically disposed. The transpositions which a more natural arrangement would render necessary are indicated in the foregoing list.

Particular Figures.

PLATE XV.

Illustrates the dentition of Ichthyosaurus.

Figs. 1 & 2 show the succession of the new teeth in the crocodile: see p. 106.

Fig. 3. The same in the fossil Saurian of Maestricht; selected as an example of the common lacertian type: page 106.


The following figures illustrate the teeth of the different species.

Fig. 7. Tooth of Ichthyosaurus platyodon: page 108.

8. \( \ldots \) I. communis, \( \ldots \) ibid.

9. \( \ldots \) I. intermedius, \( \ldots \) ibid.

10. \( \ldots \) I. tenurostris, \( \ldots \) ibid.

Fig. 11. Probably a tooth of Plesiosaurus: p. 120.
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Fig. 12. A part of the dental bone of the lower jaw; showing the mode in which the teeth are lodged, and the canals for the distribution of the branches of the inferior maxillary nerve: p. 109.

Fig. 13. Transverse section of an adult tooth of I. communis; showing the filling up the interior cavity by the ossification of the pulpy substance: p. 107.

PLATE XVI.

Figs. 1 to 5. A series of transverse sections derived from the anterior portion of a large jaw of I. platyodon: p. 112.

Fig. 6. Side view of the same jaw: ibid.

Fig. 7. Inferior view of the same; the posterior part restored from another individual of the same species.

Fig. 8. Posterior part of a large head of I. communis belonging to the Oxford Museum: the lower jaw is described p. 112; the parts surrounding the tympanal cavity, p. 116; and the occipital bones, p. 117.

Figs. 9 to 13. Transverse sections of the lower jaw, derived from the preceding specimen: p. 112.

Fig. 14. Internal view of the posterior part of the lower jaw, from the same specimen: p. 111.

N.B. In the text this is erroneously described as the jaw of the left side; being in fact the right.

PLATE XVII.

Head of Ichthyosaurus intermedius; a matchless specimen belonging to Mr. De la Beche. The sternal parts of the same specimen have been figured in the Philosophical Transactions for 1819—Plate 14. This specimen is referred throughout the description of the bones forming the head in the Ichthyosaur; and more especially for those exhibited in the roof of the mouth: see p. 117. The dislocation of the parts connected with the tympanal and occipital portion is explained in the note, p. 116.

PLATE XVIII.

Three views of the dental bone of the lower jaw in the Plesiosaurus: p. 119.

PLATE XIX.

Figs. 1 & 2. An entire head of Plesiosaurus, under two points of view: pp. 120, 121.

Fig. 3. A detached tooth: p. 120.

The middle figures, A & B, exhibit an attempt to restore the head: see p. 121.

PLATE XX.

Fig. 1. Paddle of Ichthyosaurus: p. 118.

Fig. 2. Three views of the lower occipital bone, containing the condyle of the Ick-
EXPLANATION OF THE PLATES.

thyosaurus: p. 117. a. shows the exterior and posterior extremity; b. the bone laterally, exhibiting the basilar process; c. the upper and interior surface.

PLATE XXI.

Figs. 1, 2, 3. Posterior extremity of a jaw, probably of Plesiosaurus; belonging to Colonel Birch:—described p. 122. 1. The superior surface; 2. outer side; 3. inner side.

Figs. 4, 5, 6. Humerus of peculiar form, found with the preceding: p. 122.

PLATE XXII.

Fig. 1. Femur of Plesiosaurus. Fig. 2. Os pubis. Fig. 3. Os ilium. All described p. 122.

Figs. 4 to 8. A series of vertebrae from the Kimmeridge clay; found both near Weymouth and at Heddington; probably belonging to a new species of Plesiosaurus: see p. 123.

PLATE XXIII.

A Map of part of the course of the river Sutluj, in the Himalaya mountains; in illustration of Mr. Colebrooke's paper, Article X. p. 124.

This map, as well as part of Plate XXIV, will serve also to illustrate Mr. Fraser's Notes on the Himalaya Mountains,—Vol. V. p. 60.

PLATE XXIV.

Fig. 1. A Map of part of India, in illustration of some of the papers published in the Geological Transactions; the routes or tracts of country referred to being denoted by different colours.

1. Yellow,—denotes the tract described in Mr. Colebrooke's paper, Art. X. p. 124, of the present volume; showing the connexion of the valley of the Sutluj, represented on a larger scale in Plate XXIII, with the adjoining country.

2. Brown.—Mr. Fraser's route from Delhi to Bombay, described in his paper, Art. XII. p. 141.

3. Green,—points out the parts of the N.E. of Bengal, referred to in Mr. Colebrooke's paper, Art. XI. p. 132; and in Mr. Scott's Letter, Art. XIII. p. 167, of the present volume.


5. Red.—The Island of Salsette:—Mr. S. Babington's paper; Vol. V. p. 1.

Fig. 2,—from a sketch by Mr. Fraser, illustrates the structure of the basaltic heights described at p. 158 of Mr. Fraser's paper, Art. XII. of the present volume.