EXPLANATION OF THE PLATES.

PLATE XXXII.

Six sections to illustrate Mr. Lonsdale's paper on the Neighbourhood of Bath.

PLATES XXXIII. & XXXIV.

Illustrate Mr. Murchison's paper on the Fossil Fox found at Œningen.

PLATE XXXIII.

The Fossil Fox.

PLATE XXXIV.

Outline of the Fossil Fox. (See Mr. Mantell's anatomical description, p. 291.)

PLATES XXXV. XXXVI. XXXVII. XXXVIII. XXXIX. & XL.

Illustrate the paper of Professor Sedgwick and Mr. Murchison on the Eastern Alps.

PLATE XXXV.

Map of the Eastern Alps.

The accompanying geological Map has been constructed chiefly from the observations of Mr. Murchison, during his visits to the Central and Eastern Alps in the years 1828, 1829 and 1830. The leading points elucidated in the memoir having been also examined by Professor Sedgwick in 1829. The portion of the southern flanks of the Alps which includes the districts of Verona, Vicenza, Monte Bolca, and the Euganean hills, is coloured from observation made during an excursion with Mr. Lyell in 1828. The adjoining district of Bassano was afterwards examined by Mr. Murchison alone (see Phil. Mag. and Annals of Philosophy, N. S. 1829), who in the same year travelled through the valleys of the Adige and Fassa, and portions of the Southern and Northern Tyrol.

A very large portion of the Map has necessarily been coloured from the authority of other observers; and in the first rank of merit among these must be mentioned an unpublished geological Map of the Archduchy of Austria by Dr. Boué, presented by him to the Geological Society of London*.

This map was found to harmonize, in most respects, with the observations of the authors in the same district; and the points on which they differ from Dr. Boué, have been detailed in the memoir. Considerable insight into the general struc-

* M. Boué intends to publish this map, which has recently been returned to him for that purpose, by the Council of the Geological Society.

ture of the chain was obtained by consulting an original map of great merit, executed many years since by Mr. Greenough: much assistance has also been received from M. P. Partsch of Vienna, and great obligations are due to Mons. de Buch, the reputed author of the general map of Martin Schropp & Co. The geological features of the southern part of Styria, including the Bacher and Matzel Gebirge, are chiefly taken from an original map executed by several Austrian geologists, under the direction of His Imperial Highness the Archduke John, and presented by him to the Geological Society of London. For the map of all those parts of Styria which lie within, or surround the basin of Gratz, the authors are, however, personally responsible.

A tertiary deposit is marked at Guttaring, far within the area of the primary rocks, on the authority of M. Keferstein, whose general maps have also been consulted. M. Necker de Saussure has pointed out the occurrence of a tertiary deposit at Kropp on the Save in the Alps of Carniola, where it reposes on secondary limestone (*Ann. des Sciences Naturelles*, vol. viii.). The same author has also shown the existence of a ridge of primary rocks, succeeded, between Schio and Recoaro, by others of various secondary ages. This remarkable outbreak takes place on the confines of the cretaceous series being accompanied by new porphyritic rocks which overlie the scaglia, and are probably of the same age as the Euganean trachytes. A phenomenon similar in many respects, though on a smaller scale, is seen in the northern flank of the Alps (Sonthofen, Bavaria), which is described in detail in this Memoir, p. *333*, *334*. Section, Pl. XXXVI. fig. 4.

The great expanse of green-sand and "scaglia" in the neighbourhood of Feltre, is inserted from the works of Professor Catullo *.

In the highest group, No. 1. of the map, are comprehended all the accumulations from the most recent alluvions down to the coralline, tertiary limestone of the Leitha hills near Vienna, and of Wildon &c. near Gratz. Under this colour, therefore, is represented the greatest superficial range of tertiary deposits around the Alps, particularly all those at a considerable distance from the edges of the chain.

No. 2. represents the middle and older tertiary formations, and is supposed to commence with deposits of the age of those of "Bourdeaux," and to end in the period of the "calcaire grossier." This group is found in bands and patches close along the edges of the Alps (from Bregenz to Füssen, for example,) in the forms of molasse, sandstone and conglomerate, and again in various parts of the valley of the Danube, usually in the state of marl with shells, as near Traunstein on the Alpine side, or near Ortenburgh and Pielach on the flanks of the Bohemian chain. The coal-field of Häring is assigned to the lower part of this group.

On the southern flank of the Alps the shelly deposits of the Vicentin, described by M. Brongniart, and those of Bassano, by Mr. Murchison, are amongst the most unequivocal exhibitions of these formations.

No. 3. The copperas green colour marks a peculiar shelly deposit unknown in

* The colours are only intended to indicate great groups of strata, the subdivisions of which, whether in the secondary or tertiary system, will be found in the Plate of Sections.

England, and nearly so in France and Germany, but extensively developed within, as well as on the skirts of, the Alpine chain; as at Gosau in the one case, and at Kressenberg in the other. The term "Gosau Deposits" is adopted to prevent all ambiguity, and they are shown to be supra-cretaceous in figures 6, 7, 9, and 13 of the Plate of Sections. For various patches of this formation see the Map. M. Boué has traced it into the Carpathian chain. The iron ore of the Kressenberg is placed in this group.

No. 4. comprehends all the strata from the scaglia or red chalk of the Southern Tyrol down to the base of the green-sand series, in the lowest term of which the authors place the Vienna grit or sandstone. See particularly figs. 4. and 5. of Plate XXXVI. The iron ore of Sonthofen is in the upper or cretaceous part of this group.

No. 5. This group, comprehending the Alpine and Jura limestones with dolomite, &c. includes the whole of the oolitic series and lias, and most of the salt-breccias or rock salt, as well as the principal lead veins of the Alps.

No. 6. The ferruginous red colour represents a group supposed to be of the same age with the new red sandstone and magnesian limestone. Salt and gypsum occur in it, though not in such abundance as in the limestone No. 5.

No. 7. The term "old slaty rocks" is here applied in a very comprehensive sense, and embraces every formation from the primary crystalline rocks, up to those of true transition type, occasionally containing organic remains.

(Spathose iron ore is most abundant in this class of rocks, though it does sometimes occur in granitoid rocks, and also in primary limestone.)

No. 8. represents the granitic axis of the chain, the general direction of which bears from W.S.W. to E.N.E. A remarkable bifurcation takes place near its eastern extremity, the southern branch of which stretching out into the Pach and Kor Alps, and thence into the Bacher-Gebirge, encircles the tertiary basin of Lower Styria; whilst the northern branch or continuation of the principal chain separates the Styrian basin from that of Vienna. It reappears in the Leitha Gebirge, and again beyond the Danube in the Carpathians.

The intrusive or igneous rocks are designated under two colours only, it having been found impracticable in a map of this scale to make a further separation of the different rocks of volcanic origin.

a. All volcanic rocks which traverse the tertiary or secondary deposits.

b. Older porphyries (as in the Southern Tyrol) which were consolidated anterior to the formation of the new red sandstone.

PLATE XXXVI.

Sections.

This Plate contains sixteen transverse sections illustrative of the structure of the secondary and tertiary formations of the Eastern Alps. Fig. 1. is an ideal section, and is prefixed to convey a general notion of the structure of the chain, and of the relations of the above-mentioned deposits to an axis of primary and transi-

tion rocks, and also to mark the great difference in the elevation of the youngest deposits on the north and south side of the chain *. The colours are modifications of those used in the Map, each subformation being distinguished by a tint of the colour of the great group of formations to which it belongs. (*Vide* Map.)

The horizontal distances in the detailed sections are proportioned to each other. The altitude of the mountains is much exaggerated with relation to the horizontal distances, and the culminating peaks of each section have reference only to the contiguous valley or river, without any regard to their actual height above the sea level.

R. I. M.

Plates XXXVII. XXXVIII. & XXXIX. represent unpublished species of organic remains in the Eastern Alps.

Gosau.

PLATE XXXVII.

Fig. 1. Turbinolia aspera.
Fig. 2. Cyathophyllum rudis.
Fig. 3. ———— compositum.
Fig. 4. Astrea grandis.
Fig. 5. ——— media.
Fig. 6. Astrea formosissima.
Fig. 7. ——— ambigua.
Fig. 8. ——— tenera.
Fig. 9. ——— ramosa.

Gosau.

PLATE XXXVIII.

Fig. 1. Nucula concinna.
Fig. 2. Pectunculus calvus.
Fig. 3. Crassatella impressa.
Fig. 4. Corbula angustata.
Fig. 5. Gryphæa expansa, p. 349.
Fig. 6. ———— elongata.
Fig. 7. Plicatula aspera, p. 365.
Fig. 8. Astarte macrodonta.
Fig. 9. Tornatella gigantea.
Fig. 10. Auricula decurtata.
Fig. 11. Natica lyrata.
Fig. 12. ——— angulata.
Fig. 13. Natica bulbiformis.
Fig. 14. Turbo arenosus.
Fig. 15. Trochus spiniger.
Fig. 16. Nerinea flexuosa.
Fig. 17. Solarium quadratum.
Fig. 18. Turritella biformis.
Fig. 19. ———— rigida.
Fig. 20. ———— læviuscula.
Fig. 21. Rostellaria costata.
Fig. 22. ———— plicata.
Fig. 23. ———— granulata.
Fig. 24. ———— læviuscula.

* See De Humboldt's new work (*Fragmens de Climatologie et Géologie*, vol. i. p. 89, note), in which it is stated, that the plateau of Bavaria is 1560 French feet above the sea, whilst the highest plains of Lombardy are only 480 French feet,—making a difference of 1080 French feet as the mean difference of their respective elevations.—December, 1831.

EXPLANATION OF THE PLATES.

Gosau.

PLATE XXXIX.

Fig. 15. Cardium productum.
Fig. 16. Tornatella Lamarckii.
Fig. 17. Cerithium reticosum.
Fig. 18. ——— conoideum.
Fig. 19. ——— pustulosum.
Fig. 20. Pleurotoma fusiforme.
Fig. 21. ——— spinosum.
Fig. 22. Fasciolaria elongata.
Fig. 23. Fusus heptagonus.
Fig. 24. —— carinella.
Fig. 25. Fusus muricatus.
Fig. 26. —— abbreviatus.
Fig. 27. —— cingulatus.
Fig. 28. Nassa carinata.
Fig. 29. —— affinis.
Fig. 30. Mitra cancellata.
Fig. 31. Voluta acuta.
Fig. 32. Terebra coronata.
Fig. 33. Volvaria lævis.

Lower Styria.

Fig. 1. Lutraria convexa.
Fig. 2. Cardium transversum.
Fig. 3. ——— minutum.
Fig. 4. ——— planicostatum.
Fig. 5. Amphidesma minimum.
Fig. 6. Venus obtusa.
Fig. 7. Pullastra nana.
Fig. 8. Modiola cymbæformis.
Fig. 9. Trochus variabilis.
Fig. 9*a*. ——— (recent, p. 395.)
Fig. 10. Cerithium pulchellum.
Fig. 11. ——— lineolatum.
Fig. 12. ——— disjunctum.
Fig. 13. ——— turritella.
Fig. 14. Buccinum duplicatum.

PLATE XL.—(*Lithographic View of Gosau-thal.*)

In the foreground are the church and principal village of Gosau-thal. The wooded mountain on the right is the Horn, that on the left is the Ressenberg; the summit of the former being composed of reddish, gritty sandstone, the latter of greenish, micaceous whetstone; and both are based upon blue marls with a profusion of shells, which are best exposed in deep ravines right and left of the spectator.

The steep and arid peaks in front consist of Alpine limestone, chiefly considered as the equivalents of the oolitic series, and are called in the neighbourhood the Stein Gebirge, each peak being known by a local name, as the "Donner Kogel," "Henner Kogel," &c.