

Limestone; and I think it very unwise to disturb the present nomenclature without sufficient reason.¹ The MS. names of Mr. Robert Etheridge² require confirmation, and the best way to do this would be to describe and figure them. The new genera of Professor Nicholson may in the future embrace some few of the forms already described, but we can hardly supersede the clear definitions of Lonsdale's types as given by M'Coy. In the Lower Ludlow rocks specimens of *P. lanceolata*, Goldf., often break up, showing the concentrically wrinkled central axis. In the Girvan District—Scotland—at least two distinct species of this genus may be found—*P. costellata*, M'Coy, and *P. dichotoma*, Portl.

(To be concluded in our next Number)

REVIEWS.

THE GEOLOGICAL BASIS OF THE CHIEF CITIES OF EUROPE. [Der Boden der Hauptstädte Europa's, etc.] By FELIX KARRER. Svo. pp. 68, with 23 woodcuts. (Holder: Vienna, 1881.)

THIS is a small, but concise and very useful, compendium of the geology of the European cities—Vienna, Paris, London, Brussels, Berlin, St. Petersburg, and Rome, with their environs, as determined by transverse sections of the great valleys in which they are situated. The water-supply is particularly described; and the artesian borings at the several places are described geologically, and mostly figured as illustrative sections, besides the cross-sections of the respective basins and valleys. These illustrations have been in many cases supplied by the author's geological friends in the said cities, and their aid is carefully acknowledged as well as the other authorities for compiled information. Besides the water supply (by aqueducts and wells), and the health conditions of the cities, the mineral materials of value in arts and manufactures are also noticed. Altogether, this is an excellent work, full of condensed information, and an invaluable manual of the geology of those portions of the important valleys (Danube, Seine, Thames, Senne, Spree, Neva, and Tiber) in which the great cities have been built.—T. R. J.

CORRESPONDENCE.

THE WEALDEN OF HANOVER.

SIR,—In the June Number of the GEOLOGICAL MAGAZINE, pp. 281–283, there is a Review of the Wealden of Hanover (Die Wealdenbildungen der Umgegend von Hannover, von C. Struckmann).

The monograph, we are told, is a detailed description of the Wealden formation from the beds resting upon the Portland Limestone upwards. The Wealden is divided into three stages, each forming a well-marked horizon of life. "The deepest is the "Münder oder bunte Wealden-Mergel," representing the Purbeck

¹ Since writing the above I have been able to study, very carefully, the leading types of Palæozoic *Ptilodictya*. In a future paper on the Family Ptilodictyidae I shall be able to correct many inaccuracies of our ordinary nomenclature.

² Mus. Pract. Geol. iv. $\frac{1}{10}$ in Catalogue of Camb. and Sil. Fossils.

beds of English geologists, and consisting of thick beds of limestone interstratified with beds of marl, in which are numerous specimens of *Exogyra virgula*; fossils are rare, the most abundant is *Corbula mosensis*, Buv.

Certainly, these “Münder, or bunte Wealden-Mergel” may be regarded, if the above description is correct, as one of the most anomalous formations hitherto discovered. Though a member of the Wealden, they represent the Purbecks, and contain numerous specimens of a fossil characteristic of the Kimmeridge Clay.

But this is nothing to what follows, for we read that “they attain a thickness of 120 mètres, and belong to the Upper Kimmeridge;” so that the aforesaid “Münder or bunte Wealden-Mergel,” having started as a Wealden formation, which had swallowed up all the Purbecks, now figure in the Upper Kimmeridge.

But the geological *bouleversement* of this most extraordinary region is not yet at an end, for we read that “over these” “follow dark-coloured beds, twelve mètres in thickness, rich in fossils, as *Exogyra virgula*, *Pecten concentricus*, etc., etc.,” belonging to the Lower Portland, succeeded by the Upper Portland, and Serpulit or Purbeck Limestone.

Now we were told in the first instance that these wonderful Münder-Mergel represented the Purbeck beds of English geologists, and yet in this last passage they are represented as *underlying* not only the Purbeck Limestone but both Upper and Lower Portland. Yet, in the very teeth of this statement, we read in the fifth paragraph of the review, that under the lowest member of the Wealden, viz. the Münder-Mergel, lies the Eimbeckhäuser limestone, “which belongs to the Upper Portlandian, representing a portion of the Upper Jura, and forming, it may be, passage-beds from the Portland to the Wealden.” So here we have the wonderful Münder *above* a member of the Upper Portlandian; in the second paragraph it was *below* the Lower Portland. Unless, therefore, the Lower Portland is above the Upper Portlandian, paragraphs 2 and 5 contradict each other.

This sort of muddle could never have occurred if a proper stratigraphical column had formed part of the work in question. In order to arrive at the real meaning of the author, we append a literal translation of the passage which bears on the subject, followed by a column derived from a subsequent memoir by Herr Struckmann,¹ which will represent what Herr Struckmann intended to show:—

“The Purbeck marls or Münder-marls, which are to be regarded as the transition steps to the Wealden, follow in regular superstratification the Upper Portland Beds, as the equivalent of which near Hanover the Eimbeckhäuser Plattenkalke show themselves. These conditions of stratification are most distinctly observable in the Kappenberg, which stands out from the southern slope of the Deister between Altenhagen and Nienstedt. On the western and south-western slopes of this ridge, between the village of Altenhagen and the point where the road leading over the height from Nienstedt to Messenkamp descends in various windings into the wide valley

¹ Neues Jahrb. für. Min., etc., 1881, Bd. II. p. 102.

between the Deister and Süntel, there are a series of quarries, which furnish excellent information upon the sequence of the rocks. The strike of the beds runs from S.E. to N.W., with a very slight dip to N.N.E. The lowest beds consist of a very compact, blue limestone divided into thick beds, which is converted into quicklime in many limekilns. Upon this, separated by argillaceous partings, follow compact, oolitic, flaggy limestones with numerous examples of *Exogyra virgula*. Otherwise fossils are scarce; *Corbula mosensis*, Buv., is the one that occurs most abundantly. These beds, which according to Credner attain a thickness of about 120 mètres, belong to the Upper Kimmeridge. Upon them follow a thickness of about 12 mètres of dark, in part black, marly limestones and shaly clays, with occasional intercalated thin, hard, flaggy limestones, rich in fossils, especially *Exogyra virgula*, etc. These beds belong to the Lower Portland. Over these come the strata of the Upper Portland or the Eimbeckhäuser Plattenkalke, which cover the whole broad ridge of the Kappenberg, with a thickness, according to H. Credner,¹ of at least 88 mètres. They are on the whole poor in fossils; but *Gervillia obtusa*, etc., are more or less abundant upon particular slabs.

“On the northern slope of the Kappenberg the Plattenkalke are directly overlain by the Purbeck Marls, upon which, for example, the village of Nienstedt stands; they can also be traced along the road to Egestorf as far as the point where the forest road branches off towards the Cöllnische Feld; their thickness here amounts to about 80 mètres; above them follows the Serpilit.”

The following is the sequence in the neighbourhood of Hanover, as given by Strüeckmann in his paper “On the Parallelism of the Hanoverian and English Upper Jurassic Deposits, above referred to:

	ENGLAND.	HANOVER.
WEALDEN	{ Weald Clay. Hastings beds. Purbeck beds.	Upper Wealden. Middle Wealden. Purbeck (Serpulite) or Lower Wealden. Münder-Mergel as a transition between Purbeck and Portland.
PORTLAND	{ Portland Stone. Portland Sand. }	Eimbeckhäuser, Plattenkalke. Zone of <i>Ammonites gigas</i> .
KIMMERIDGE	{ Upper Kimmeridge Clay. Lower Kimmeridge Clay. Kimmeridge Passage Beds.	Upper Kimmeridge or <i>Virgula</i> Beds. Middle Kimmeridge or <i>Pteroceras</i> Beds. L. Kimmeridge (Astartian) = <i>Nerinea</i> beds & Zone of <i>Terebratula humeralis</i> .
August, 1881.		J. M. & W. H. H.

A CORRECTION.

SIR,—Will you allow me to correct a mistake I made in a letter appearing in your August Number? Mr. Day’s simple method for determining the outcrop on any given surface of a bed or trough of known cylindrical form, by means of a shadow cast in direct sunlight, is equally applicable to the inverse proposition, viz., to determine the form of the trough, knowing the outcrop.

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SANDRIDGE VICARAGE,
ST. ALBANS, Aug. 27, 1881.

¹ Credner, *Ob. Jura*, p. 68.