

of a deposit formed in tolerably shallow water. In the Alps of Lombardy and the Tyrol, in Luxembourg, in France, and, in fact, throughout nearly the whole of Europe, they form a sort of fringe in the margin of the Triassic sea; and, although of comparatively inconsiderable thickness in England, they become highly developed in Lombardy, &c., to an enormous thickness, and constitute the great mass of the Rhætian Alps and a considerable part of the well-known beds of St. Cassian, and Hallstadt in the Austrian Alps. (See page 205.)

The Rhætic beds of Europe were, as a whole, formed under very different conditions in different areas. The thickness of the strata and the large and well-developed fauna (chiefly Mollusca) indicate that the Rhætic strata of Lombardy, and other parts of the south and east of Europe, were deposited in a broad open ocean. On the other hand, the comparatively thin beds of this age in England and north-western Europe, the fauna of which, besides being poor in genera and species, consists of small and dwarfed forms, point to the conclusion that they were in great part deposited in shallow seas and in estuaries, or in lagoons, or in occasional salt lakes, under conditions which lasted for a long period.*

In consequence of the importance they assume in Lombardy (the ancient Rhætia), the name "Rhætic Beds" has been given to these strata by Mr. Charles Moore; Dr. Thomas Wright has proposed the designation "Avicula Contorta Zone," from the plentiful occurrence of that shell in the black shales forming the well-marked middle zone, and which is everywhere present where this group of beds is found; Jules Martin and others have proposed the term "Infra-lias," or "Infra-liassic strata;" while the name "Penarth Beds" has been assigned to these deposits in this country by Mr. H. W. Bristow, at the suggestion of Sir Roderick Murchison, in consequence of their conspicuous appearance and well-exposed sections in the bold headlands and cliffs of that locality, in the British Channel, west of Cardiff.

A fuller description of these beds will be found in the Reports of the Bath Meeting of the British Association (1864), by Mr. Bristow; also in communications to the *Geological Magazine*, for 1864, by MM. Bristow and Dawkins;† in papers read before the Geological Society by Dr. Thomas Wright,‡ Mr. Charles Moore,§ and Mr. Ralph Tate,|| as printed in their *Quarterly Journal*; and by Mr.

* See A. C. Ramsay, "On the Physical Relations of the New Red Marl. Rhætic Beds, and Lower Lias," *Quart. Jour. Geol. Soc.*, vol. 27, p. 189.

† *Quart. Jour. Geol. Soc.*, vol. xx., p. 396.

§ *Ibid.*, vol. xvii., p. 483.

‡ *Ibid.*, vol. xvi., p. 374.

|| *Ibid.*, vol. xx., p. 103.