

of sodium) are not infrequent, though this substance is only workable at a few places (Antrim, Cheshire, Middlesbrough<sup>14</sup>). The salt is chiefly obtained by dissolving the material underground and pumping up the brine, very little being now actually mined. The rock-salt as it occurs intercalated in the marls is a crystalline substance, usually tinged yellow or red from intermixture of clay and peroxide of iron, but is tolerably pure in the best parts of the beds, where the proportion of chloride of sodium is as much as 98 per cent. Through the bright red marls with which the salt is interstratified there run thin seams of rock-salt, also bands of gypsum, somewhat irregular in their mode of occurrence, sometimes reaching a thickness of 40 feet and upward.

The paucity of organic remains in the English Keuper indicates that the conditions for at least animal life must have been extremely unfavorable in the waters of the ancient Dead Sea wherein these red rocks were accumulated. The land possessed a vegetation which, from the fragments yet known, seems to have consisted in large measure of cypress-like coniferous trees (*Voltzia*, *Walchia*), with calamites on the lower more marshy grounds. The red marl group contains in some of its layers numerous valves of the little crustacean *Estheria minuta*, and a solitary species of lamellibranch, *Pullastra arenicola*. A number of teeth, spines, and sometimes entire skeletons of fish have been obtained (*Dipteronotus cyphus*, *Palæoniscus superstes*, *Hybodus Keuperi*, *Acrodus minimus*, *Sphenonchus minimus*, etc.). The bones, and still more frequently the footprints, of labyrinthodont and even of saurian reptiles occur in the Keuper beds—*Labyrinthodon* (4 species), *Cladyodon Lloydii*, *Hyperodapedon*, *Palæosaurus*, *Zanclodon* (*Teratosaurus*), *Thecodontosaurus*, *Rhynchonosaurus*, and footprints of *Cheirotherium*. The remains of the small marsupial *Microlestes* have likewise been discovered in the highest beds sometimes taken as the base of the Rhætic series.

At the top of the Keuper marl certain thin-bedded strata form a gradation upward into the base of the Jurassic system. As their colors are gray, blue, and black, and contrast with the red and green marls below, they were formerly classed without hesitation in the Jurassic series. Egerton,

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<sup>14</sup> T. Hugh Bell on salt deposits of Middlesbrough, Proc. Cleveland Inst. Engin., Session 1882-83.