

remarkable substance is highly valuable as a source of artificial manures. (Book III. Part II. Section iii.)

**Bone-Breccia**—a deposit consisting largely of fragmentary bones of living or extinct species of mammalia, found sometimes under stalagmite on the floors of limestone caverns, more or less mixed with earth, sand, or lime. In some older geological formations, *bone-beds* occur, formed largely of the remains of reptiles or fishes, as the "Lias bone-bed," and the "Ludlow bone-bed."

**Coprolitic nodules and beds**<sup>138</sup>—are formed of the accumulated excrement (coprolites) of vertebrated animals. Among the Carboniferous shales of the basin of the Firth of Forth, coprolitic nodules are abundant, together with the bones and scales of the larger ganoid fishes which voided them: abundance of broken scales and bones of the smaller ganoids can usually be observed in the coprolites. Among the Lower Silurian rocks of Canada, numerous phosphatic nodules, supposed to be of coprolitic origin, occur.<sup>139</sup> The phosphatic beds of the Cambridgeshire Cretaceous rocks are now largely worked as a source of artificial manure. In popular and especially commercial usage, the word "coprolitic" is applied to nodular deposits which can be worked for phosphate of lime, though they may contain few or no true coprolites.

**Phosphatic Chalk.**—In the Chalk of France and Belgium, more sparingly in that of England, certain layers occur where the original calcareous matter has been replaced to a considerable extent by phosphate of lime. Such bands have frequently a brownish tint, which on examination is found to result from the abundance of minute brown grains composed mainly of phosphate. The foraminifera and other minuter or fragmentary fossils have been changed into this brown substance. The proportion of phosphate of lime ranges up to 45 per cent or more.<sup>140</sup>

4. **CARBONACEOUS.**—The formations here included have almost always resulted from the decay and entombment of vegetation on the spot where it grew, sometimes by the drifting of the plants to a distance and their consolidation

<sup>138</sup> On the origin of phosphatic nodules and beds, see Gruner. Bull. Soc. Géol. France, xxviii. (2d ser.), p. 62. Martin, op. cit. iii. (3d ser.), p. 273.

<sup>139</sup> Logan's "Geology of Canada," p. 461.

<sup>140</sup> See A. F. Renard and J. Cornet, Bull. Acad. Roy. Belgique, xxi. (1891), p. 126. A. Strahan, Quart. Journ. Geol. Soc. xlvii. (1891).