the circumstances that led him to notice it.* Happening to be dining with a calico printer on a leg of fresh pork, he was surprised to observe that the bones, instead of being white as usual, were of a deep red colour; and on inquiring into the circumstances, he learned that the pig had been fed upon the refuse of the dying-vats, which contained a large quantity of the colouring substance of madder. So curious a fact naturally attracted much attention among physiologists, and many experiments were undertaken with a view to ascertain the time required to produce this change, and to determine whether the effect was permanent or only temporary. The red tinge was found to be communicated much more quickly to the bones of growing animals than to those which had already attained their full size. Thus the bones of a young pigeon were tinged of a rose colour in twenty-four hours, and of a deep scarlet in three days; while in the adult bird, fifteen days were required merely to produce the rose colour. The dye was more intense in the solid parts of those bones which were nearest to the centre of circulation, while in bones of equal solidity, but more remote from the heart, the tinge was fainter. The bone was of a deeper dye in proportion to the length of time the animal had been fed upon madder. When this diet was discontinued, the colour became gradually more faint, till it entirely disappeared.†

§ 4. *Skeleton of the Vertebrata.*

The purposes to be answered by the Skeleton, in vertebrated animals, resolve themselves into the three following: first, the affording mechanical support to the body generally, and also to different portions of the body; secondly, the pro-

* Philosophical Transactions, for 1736, vol. xxxix. 287 and 289.

† These experiments by no means prove, as was once supposed, that the substance of the bone is renewed with every change of hue; but merely that the colouring particles of madder, when present in the blood, readily attach themselves to the phosphate of lime in the bones, and are as quickly washed out again by the circulating fluid, when restored to its usual state. (See a paper by Mr. Gibson, in the memoirs of the Lit. and Phil. Soc. of Manchester. Second series, i. 146.)