

in which the proportion of phosphate of lime is the greatest, when compared with that of the animal substance which cements them together; the force of mutual cohesion among its own particles being much greater than that imparted by the cementing ingredient. The internal bony portions of the ear, where, in order perfectly to transmit the sonorous vibrations, the greatest solidity is required, are the densest parts of the skeleton; and phosphate of lime enters most largely into the composition of these bones. The tympanic portions of the temporal bone of the whale and the cachalot, where the great size of the organ gives us advantages in examining them, are as dense and as hard as marble. The bony portions of the teeth, likewise, afford instances of very hard calcareous formations: but the enamel, which consists almost wholly of phosphate of lime, is harder still, and resembles the siliceous stones, being, like flint, capable of striking fire with steel. It is scarcely necessary to point out the obvious intentions which are fulfilled by this peculiarity of structure, conferring extraordinary hardness on a part, of which the appropriate office is that of breaking down hard bodies subjected to their mechanical action. But this extreme degree of crystalline hardness would be ill-suited to other parts of the frame. In ordinary bones, absolute rigidity is not the quality which is alone wanted; for, in general, the hardest bodies are also the most fragile. An excess of rigidity, therefore, would have been attended with brittleness, and been productive of the worst consequences to parts exposed to sudden and violent concussions. It is in order to guard against this evil that an elastic animal matter is employed as the basis of the structure, acting as a strong cement interposed between the calcareous particles.

This composition of bone is rendered evident by subjecting it to certain chemical processes. On exposure to heat, we find it first becoming black, from the development of the charcoal attendant upon the destruction of the animal membrane. The oil contained in the cavities exudes, and, taking fire, is soon totally consumed. The bone then recovers its whiteness, and undergoes no farther change by the