

composition; for while cartilage is formed almost wholly of albumen, the animal basis of bone is almost entirely resolvable into gelatin.

Thus may a bone be analyzed into its two constituent parts: by the process first described we obtain its earth deprived of its animal constituent; by the second, we obtain its membranous basis free from earth. The first of these gives it hardness; the second, tenacity: and thus, by the intimate combination of these elements, two qualities, which, in masses of homogeneous and unorganized matter, are scarcely compatible with one another, are skilfully united.

The mechanical structure of bone is no less worthy of admiration, as evincing the skill with which every part is adapted to its destined uses. The animal membrane, which, as we have seen, is the bed in which the calcareous phosphate is deposited, partakes of the reticular structure belonging to the ordinary cellular texture; and a bone, when minutely examined, exhibits also the same appearance of plates intermixed with fibres. In the outer compact portion, indeed, the fibrous arrangement of the particles is not so easily distinguished: but it may be detected in young bones while they are becoming ossified: and also in bones which have been long exposed to the weather, or long macerated in water. The interior of most bones, in the higher classes of animals, presents distinctly the appearance of irregular cavities, resulting from the partial separation of the plates, and their mutual crossings, and fibrous connexions.

The different mechanical purposes for which bones are employed in the animal economy require them to be of different forms. Where a part is intended to have compactness and strength, with a very limited degree of motion, it is divided into a great number of small pieces, united together by ligaments, and the separate bones are short and compressed, approaching more or less to a cubical shape. Of such is the column of the spine composed, as also the joints of the wrist and ankle. Where the principal object is either extensive protection, or the provision of broad surfaces for the attachment of muscles, we find the osseous structure ex-