the structure: there is but little to answer to the lime and magnesia phosphates constituting the main frame-work of the hard internal skeleton of vertebrata, or to those composing the exoskeleton of crustacea and lower orders. The phosphorus of a plant would seem to correspond more closely to that of the nervous and vascular animal tissues; as, for example, to that of the brain in man,—which amounts to 0·9 per cent. of the cerebric acid,—or of the albumin and fibrin of the blood.

The following Table (II), which might be greatly amplified, has been compiled for the sake of comparison:—

TABLE II.

PHOSPHORUS IN ANIMAL SUBSTANCES.

Ox Bone .....12.25—Fremy.
Human Bone ..... 9.21—Richardson.*
Lingula ovalis (shell—recent sp.) ....17.16—Sterry Hunt.†
Mastodon (fossil bone) .....17.13—Pratt.‡

Casein .....1.42—Mülder.	Milk (of cow) ....0.68—Haidlen.
Urine (human) ...1.24—Berzelius.	Fibrin (of blood) ..0.58—Fownes.
Cerebric Acid (human brain) .....0.90—Fremy.	Albumin (of blood) 0.40—Mülder.

Gastric Juice, Saliva, Mucus, Etc., etc. .....Traces—Fownes.

From the researches of chemists and physiologists it is now fully established that the element phosphorus plays a most important part in the performance of nerve functions; that it undergoes many, at present, inexplicable changes within the bodies of vertebrate animals; and that various of its oxy-compounds, produced by such changes, as well as the phosphates resulting from the waste of the bones, are constantly rejected from the system in a soluble condition.

There is, therefore, in the history of the element phosphorus, a beautiful example of a complete circle of changes; and of a number of substances existing, at one time or

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* Chemical Technology, vol. ii, Article "Soluble Phosphates."

† First discovered by Dr. T. Sterry Hunt, who, in 1854, showed the shells of Lingula to have a composition identical with the bones of vertebrates. (Silliman's Journal [2], vol. xvii., p. 235.)

‡ Report South Carolina Phosphates, 1868 About 30 per cent. organic matter lost by decomposition, while the recent Lingula examined by Dr. Hunt had previously lost 38 per cent. of organic matter by calcination.