VI. Comparative analysis of human bones, and those of different animals

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shank likewise informs me, that after the combustion of good gunpowder under mercury, no water is ever perceptible.

References to the Figures of the Glass Globe, &c. mentioned in Section VII. (See Plate VIII.)

A, a ball or globe of glass, nearly half an inch thick, and seven inches in diameter. It has two necks, on which are cemented the brass caps B, C, each being perforated with a female screw to receive the male ones D, E: through the former a small hole is drilled; the latter is furnished with a perforated stud or shank G. By means of a leather collar H, the neck C can be air-tightly closed. When a portion of the powder is to be exploded, it must be placed on a piece of paper, and a small wire laid across the paper, through the midst of the powder: the paper being then closed, is to be tied at each end to the wire, with a silken thread, as shown at I. One end of this wire is to be fastened to the end of the shank G, and the screw D inserted to half its length into the brass cap B; the other end of the wire, *a*, by means of the needle K, is to be drawn through the hole F. The screw E being now fixed in its place, and the wire drawn tight, it is to be secured by pushing the irregular wooden plug L into the aperture of the screw D, taking care to leave a passage for air. The stop-cock M, the section of which is shown at N, is now to be screwed on to the part D, which is made air-tight by the leather collar *b*. The glass tube O is bent, that it may more conveniently be introduced under the receiver of a pneumatic apparatus. P shows the manner of connecting the glass tube with the stop-cock.

VI. *Comparative Analysis of Human Bones, and those of different Animals.* By C. MERAT-GUILLOT, Apothecary at Auxerre*.

BUFFON says, "We ought to collect objects of every kind, to compare them, to study their nature, and from their combined relations to deduce that information which may

* From the *Annales de Chimie*, No. 100.

enable us to acquire a clear conception of them, and to increase our knowledge respecting them *." Fourcroy observes, in his *Elements of Chemistry*, under the head Bone, that "We cannot refuse believing that the bones of man and of quadrupeds are of a different nature from the soft and flexible bones of fishes, reptiles, and, above all, the corneous skeletons of insects, as well as from the calcareous testaceous covering of worms which have shells."

Being desirous to ascertain the truth of what had been advanced by C. Fourcroy, and guided by what is prescribed by Buffon in the treatise above mentioned, I undertook a labour, superior, no doubt, to my ability, and in which it is possible I may have been deceived, but which I submit to the judgment of those who are masters in the art. I was desirous of procuring all the objects which it was necessary should be subjected to comparison; such as a series of human bones, from which I might trace out the progress of ossification; but as I could not, and wishing to know at least the difference between products of animal bones at an early age, and those of the same animal at an advanced age, I employed for that purpose the bones of oxen and calves. I wanted, to complete my experiments in this analysis, the bones of carnivorous animals, the skeletons of insects, &c. When I am able to procure them, I shall resume my labours.

Being desirous to comprehend in this analysis, hair, corneous substances, and the bristles of different animals, I remarked, when treating the first of these substances with caustic soda, by means of heat, that there was produced a considerable disengagement of ammonia; that in pouring into this solution the muriatic acid, there was disengaged sulphurated hydrogen, and that a blackish precipitate, but in very small quantity, was thrown down. Having boiled this liquor, there was still disengaged a great deal of sulphurated hydrogen, from which I conjectured that it contained sulphur; and this fact I wished to ascertain. With that view, I put a silver spoon into the liquid, and again boiled it; the spoon became exceedingly black, and I thence concluded that the hair contained sulphur. As this labour presented

* *Discours de la Manière d'Etudier et de Traiter l'Histoire Naturelle*, p. 16.

peculiar results, which cannot be compared with the analysis here given, I intend, having already collected notes on that subject, to make a particular analysis of this substance compared with that of other substances of an analogous nature.

It is to be observed that I always operated on 100 parts of each substance, and that all the products, the quantities of which I determined, had been previously dried as much as possible.

Names of the Substances.	Proportions of Gelatinous Matter.	Proportions of the Phosphat of Lime.	Proportions of the Carbonat of Lime.	Loss.
Human bones taken from a burying-ground	16	67	1'5	15'5
Dry human bones which had not been in the earth	23	63	2	2
Bones of an ox -	3	93	2	2
— of a calf -	25	54	traces of it	21
— of a horse	9	67'5	1'25	22'25
Teeth of a horse	12	85'5	0'25	2'25
— of an elephant, or ivory	24	64	0'1	11'15
Bones of a sheep	16	70	0'5	13'5
— of the elk	1'5	90	1	7'5
Horns of the stag	27	57'5	1	14'5
Bones of a swine	17	52	1	30
— of the hare	9	85	1	5
— of a hen -	6	72	1'5	20'5
Egg-shells - -	3	2	72	23
Bones of the pike	12	64	1	23
— of the carp	6	45	0'5	48'5
— of the viper	21'5	60'5	0'5	17'5
Lobster shells - -	18	14	40	28
Mother-of-pearl	2'5	0	66	31'5
Crab's eyes - -	2	12	60	26
White coral - -	1'5	0	50	48'5
Red ditto - -	0'5	0	53'5	46
Articulated coral-line - - -	7'5*	0	49	43'5
Cuttle-fish bones	8	0	68	24

Being desirous to ascertain whence arose the loss experienced in each analysis, I subjected to a strong heat 100 parts

* The product which I place under the head of Gelatinous Matter, is not entirely composed of that substance. In my opinion it contains a portion of a substance analogous in its nature to that which forms the polyiers known under the name of *lithophytes*.

of

of crabs eyes: they decreased 22 parts, and for that reason, I presume that this loss might be ascribed to the water which is found, at least in the gelatinous matter, since it is dried as much as possible; but as there still remains four parts, I ascribe the loss to a portion of the gelatinous matter which is found dissolved in the liquid employed for the analysis, and to a small quantity of a saline substance which I did not examine, and which may be dissolved in it. Should this essay be of any utility, the end I proposed will be answered*.

VII. *Method of determining the Quantity of Sulphur and Iron contained in Yellow Copper Ore.* By B. G. SAGE, Director of the first School of Mines †.

THE colour of this ore is a bright yellow inclining to that of gold; on the surface of it there is often observed red, dish, violet, purple, and greenish blue varying shades, on which account it has been called peacock's-tail or pigeon's-neck copper ore. The form of this yellow copper ore is the equilateral tetraedron and its varieties. Though it is rare to find these crystals regular, the ore, in a compact, irregular, and sometimes lamellated mass, is very common; some of it is met with in the schistous impressions of fish found at Eisleben and Mansfeld.

I have said, in the second volume of my Mineralogy, that the yellow copper ore always contains iron and sulphur in greater or less quantity: the proportions I have been able to determine by the following experiments. The yellow copper ore which I employed had no matrix. Having pulverised it in a copper mortar, four hundred grains of it were exposed to torrefaction in a test, but, as it was too much heated, the ore became fused, and produced a yellow compact brilliant mass, which had a violet appearance in some parts of its fracture. This ore was not in the state of slag, that is to say, in a black mass, as is the case when torrefied on a large scale.

* This analysis agrees pretty well with that of Mr. Hatchett already given in this Magazine, Nos. 21 and 24.

† From the *Journal de Physique*, Prairial, an. 8.

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