

XXIV.—*Creatine a constituent of the Flesh of the Cetacea.*

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A fine specimen of the Rorqual Whale (*Balænoptera musculus*), having been brought into Margate in February last, I availed myself of the opportunity afforded of ascertaining whether creatine, which has been found to be a constituent of the muscles of various mammals, birds, and fishes, was likewise contained in those of the cetacea. It has been shown by Liebig that the muscles of fat animals yield a much smaller quantity of this substance than those of lean ones; and as the whale may be ranked pre-eminently among the former, it was deemed necessary, in order to ensure a decided result, that a large quantity of the flesh should be employed. For this purpose about 40 lbs., the freest from fat that could be selected, were treated in the manner described by Liebig in his research into the constituents of the juices of the flesh; 10 lbs. of the flesh were cut into small pieces, and well kneaded with an equal weight of cold water. The

flesh was then removed to another vessel holding the same amount of water, and after being again well pressed, was put in linen bags into a strong screw-press, and as much of the liquor obtained as possible; the second water served as the first receptacle for another 10 lbs. of flesh, which were treated in like manner, &c. In this way the extract from the 40 lbs. was eventually obtained. The large quantity of fat which collected on the surface of the fluid had to be removed prior to the liquid being strained through flannel bags for the purpose of separating any muscular fibre and fatty matter that might be suspended in it. The filtered liquid, which was of a blood colour and exhibited an acid reaction, was heated in large evaporating pans over a water bath, whereby the albumen was coagulated, taking with it nearly the whole of the colouring matter, the liquid, on being strained through linen bags, retaining only a very faint colour.

The odour and flavour of this filtrate was not distinguishable from that of the extract of beef. In order to separate the last traces of albumen, the liquid extract was rapidly heated to ebullition over a strong fire in a tinned copper vessel. After being filtered, the solution was mixed with concentrated baryta-water till a precipitate ceased to be formed, a point which was reached long after the acid reaction had disappeared. The almost colourless filtrate, when evaporated in the water bath, acquired a dark brown colour, and became gradually gelatinous, emitting an odour very similar to that of glue. The concentrated liquor was now placed in a cool situation in several shallow vessels, when, after the lapse of forty-eight hours, numerous minute glittering crystals were deposited, which, owing to their great specific gravity, could be easily separated by decantation of the supernatant liquid. When dried in this minute state, these crystals presented a beautiful appearance, refracting light with remarkable intensity. After three or four crystallizations, they may be obtained quite pure. If their aqueous solution be allowed to crystallize slowly, crystals one quarter of an inch in length are formed, presenting a silky lustre, and frequently arranged in groups. These crystals are insoluble in alcohol, but very soluble in boiling water; when warmed on platinum foil, they lose their lustre, becoming opaque and white; when heated more strongly, they carbonize, emitting the odour of burning nitrogenous substances; on the application of a still stronger heat, the carbon is entirely consumed, no ash remaining behind.

0.3097 grms. of this substance, when kept for some time in a water bath at a temperature of 212° F., lost 0.0378 grms.,

corresponding to 12·2 per cent of water, the amount found by Liebig in creatine prepared from different sources.

I must not forget to state that I obtained this substance (a specimen of which I have the honour to lay before the Society) in very small quantity. There can be no doubt as to the identity of this body with that described by Chevreul, Liebig, Schlossberger and Gregory; and we may safely conclude that it is a constituent, in greater or less amount, of the fluids of the flesh of all the higher class of animals.
