XXV. *Some account of the nests of the Java swallow, and of the glands that secrete the mucus of which they are composed.* By *Sir* Everard Home, *Bart. V. P. R. S.*

Read June 26, 1817.

The nests of a particular species of swallow which is principally met with in the island of Java, have from time immemorial formed an article of trade between that island and China, where they are purchased at a high price by that voluptuous people, it being believed, that the materials of which the nests are composed, are possessed of an aphrodisiac virtue in an eminent degree. They have been occasionally brought into this country, and are preserved in collections of natural history, as curiosities. In what manner the bird procures the materials out of which the nest is made, has till now remained unknown; a thousand conjectures have, however, been made upon this subject. It has been supposed by some, that it is a gluten collected from the mollusca picked upon the surface of the sea. By others, a substance extracted from certain fuci found on the sea shore. By others again, a portion of the food in a half digested state regurgitated to be employed for this particular purpose. Sir Stamford Raffles, who has just returned from Java, where he resided five years, as lieutenant governor, has brought over a number of these nests, and has been kind enough to offer me some of them, for the purpose of investigating the nature of

the materials of which they are composed, and gives it decidedly as his own opinion, that, whatever it is, it is brought up from the stomach, and requires at times so great an effort, as to bring up blood, the stain of which is seen on the nest. This account of Sir STAMFORD RAFFLES, in the correctness of whose observation I have the greatest confidence, led me to investigate this subject, and to ascertain by examination whether this particular swallow has any glands that are peculiar to its œsophagus, or stomach, enabling it to secrete a mucus similar in its nature to the substance of which the nest is composed. I at the same time requested my friend, Professor BRANDE, to analyze one of the nests, and to inform me of its composition. In examining the gastric glands of the Java swallow, even with the assistance of a common magnifying glass, I saw an obvious difference between the appearance of the orifices by which the secretion is poured into the gizzard, and of those of other birds, but, as I had never examined those glands in the common swallow which migrates to this country, it became necessary, before I proceeded farther in the enquiry, to ascertain whether in all the swallow tribe there were similar structures. In the present season this opportunity has been afforded me, and I find that in the common swallow, both male and female, the orifices of the gastric glands differ in nothing from those of birds in general, but that the peculiar structure which I am about to describe is confined to the Java swallow. This bird, Sir STAMFORD RAFFLES informs me, does not migrate, but remains all the year an inhabitant of the caverns in that island. Some of the most extensive caves in which they reside, are forty miles from either sea. Those swallows that build their nests near the

sea, are observed to fly inland towards extensive swamps where gnats and other insects are in great abundance. Those that build in inland caves, are observed to quit the caves in the morning, and generally return in swarms darkening the air, towards the close of the day; they are, however, going in and out the whole of the day. This bird is double the size of our common swallow. There are two separate nests, one for the male to lie and rest in, which is oblong and narrow, adapted to his form, the other wide and deeper, to receive the female and the eggs.

As Mr. BAUER has been kind enough to make drawings of the gastric glands in the blackbird, the common swallow, and Java swallow, in which the parts are so much magnified, that the difference in their structure is obvious to the most superficial observer, it is not necessary in this place to enter much into detail respecting them: I shall only observe, that from what is represented in the drawings, it is evident that the gastric glands in the swallow tribe, both those that migrate and those that remain during the whole year in Java, do not afford the same supply of gastric liquor as in other birds, since they have a smaller receptacle belonging to the gland into which the secreted liquor is to be received. This circumstance confirms the observations that I made, upon a former occasion, respecting the gastric glands of the casuary of Java and of the ostrich, that these glands are largest in those birds that inhabit countries that afford a small supply of nourishment. The swallow of Java, as well as the casuary of that island, lives in perpetual plenty, and the swallow that migrates, although it travels from the equator to the pole, only remains in cold countries during the summer season,

while the sun is fertilizing them, and therefore has probably an equally abundant supply of its natural food in the regions of the north, as at the equator.

The only difference between the glands of the migrating swallow, and those of the blackbird, is the smallness of the reservoir, the surface of the gullet upon which the external openings of the glands are seen is exactly the same, there is not in the one or the other any apparatus for secreting mucus which is not common to birds in general.

In the Java swallow we have, on the other hand, a structure of a particular nature; there is a membranous tube surrounding the duct of each of the gastric glands, which, after projecting into the gullet for a little way, splits into separate portions like the petals of a flower: for what purpose so extraordinary an apparatus could be provided, would probably have puzzled the weak intellects of human beings, and many wild theories might have been formed respecting it, had not the animal matter of which the bird's nest is composed, and the accurate observation of Sir STAMFORD RAFFLES, who had no doubt that the materials of the nest were produced from the gullet, led to the discovery of its use.

That the mucus of which the nest is composed, is secreted from the surface of these membranous tubes, there is no more doubt than that the gastric juice is secreted from the glands whose ducts these tubes surround; and this confirms an opinion which I have adopted for many years, that membranes on which no glandular structure could be seen, were capable of secreting mucus; and now that we find those membranes, where their surfaces are so much magnified, exhibit no glandular structure, we may, without the chance of

more accurate observers refuting us, be satisfied that no such structure exists.

There are, perhaps, no more curious provisions given to animals by their Creator, than those which are to be employed for the preservation of their young, while it yet remains in the egg; but as many of these belong to the organs of generation themselves, or arise from secretions produced by glands immediately connected with them, they pass unnoticed, the mind being lost in the contemplation of so wonderful a contrivance as generation itself.

The present provision for forming a nest out of its own secretions, in an animal of so high an order as the class Aves, strikes us with astonishment, since birds in all other countries find substances of some kind or other out of which they form their nests, and makes it evident that this particular bird, at the time of its first creation, was intended to be the inhabitant of the caverns of Java, in which nothing is to be met with out of which a nest could be constructed, as the camel is adapted to the sandy deserts of which it is the natural inhabitant, both by the provision in its stomach for carrying a store of water, and the form of its hoof, which cannot, like that of other animals, be injured by walking in sand.

The swallows of Java that reside upon the coast, never exhaust their secretions in forming their nests when they find other materials fitted for that purpose.

The nearest approach to a provision of this kind, is in the insect tribe, the bee secreting wax out of which it forms its comb, both for the nest of its young, and a reservoir to contain supplies of nourishment.

The nest described in the preceding Paper, appears to con-

sist of a substance having properties intermediate between gelatine and albumen. It resists for a considerable time the action of warm water, but after some hours enlarges and softens; upon drying, it again resumes its former appearance and properties, becoming somewhat more brittle than before, probably, in consequence of having lost a very small portion of gelatine, which delicate tests discover in the water.

In the diluted acids, this substance dissolves with more ease than coagulated albumen; in the concentrated acids, its properties are nearly the same as those of coagulated white of egg.

With the caustic and subcarbonated fixed alcalis, it forms saponaceous compounds, which are decomposed by the acids with the same appearances as other albuminous soaps. It readily dissolves in liquid ammonia, and in the solution of subcarbonate of ammonia, circumstances in which it differs from albumen. When submitted to destructive distillation, a relatively small portion of ammonia is formed, and the remaining coal is easy of incineration, circumstances which likewise lead to point out a distinction between this substance and albumen.

Explanation of Plate XVI.

Fig. 1. The gizzard and part of the gullet of the Java swallow slit up and laid open, magnified twice in diameter, or 4 times in superficies.

Fig. 2. A small portion of the lowermost part of the gullet, magnified 15 times in diameter, or 225 times in superficies.

Fig. 3, 4, and 5. Side view of the glands of different sizes.

Fig. 6. Perpendicular section of Fig. 5.

Fig. 7. A top view of one of those glands; the figures 3, 4, 5, 6, and 7, are magnified 50 times in diameter, or 2500 in superficies.

Fig. 8. A small portion of the lowermost part of the gullet of the common swallow.

Fig. 9. A small portion of the lowermost part of the gullet of the black bird, both figures are magnified 15 times in diameter, or 225 times in superficies.

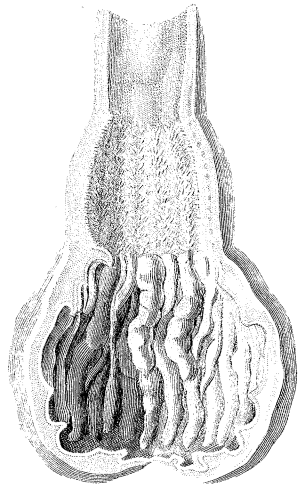

Fig. 1.

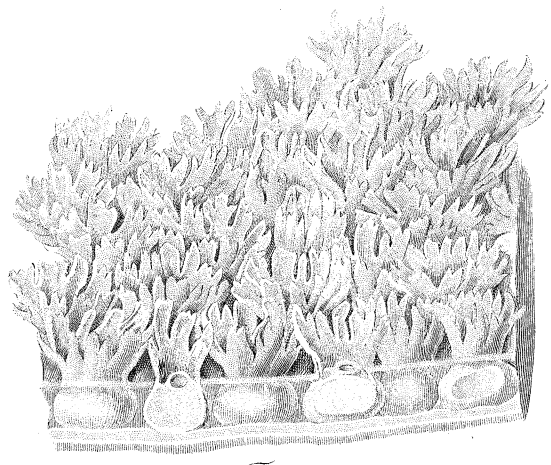

Fig. 2.

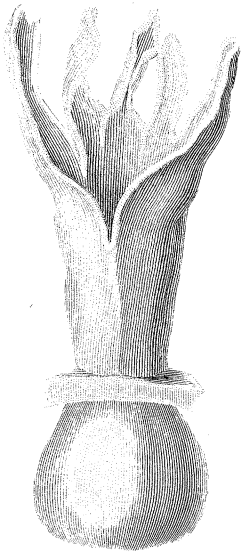

Fig. 3.

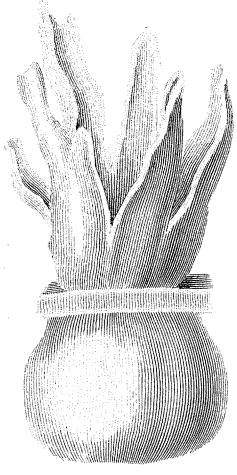

Fig. 4.

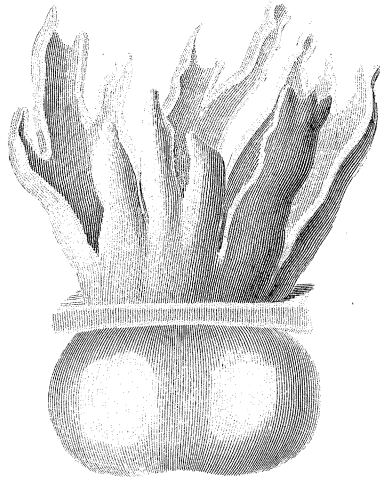

Fig. 5.

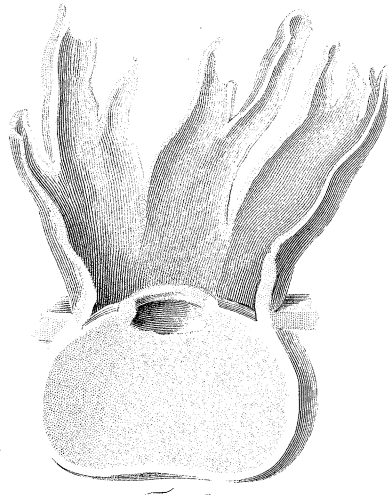

Fig. 6.

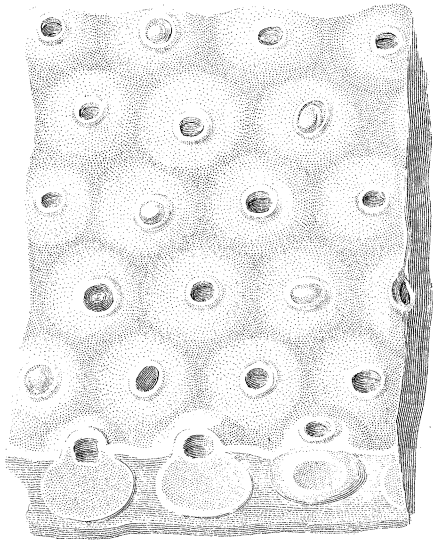

Fig. 8.

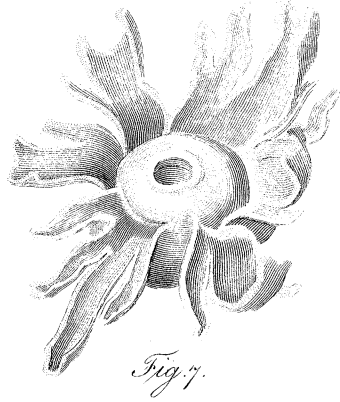

Fig. 7.

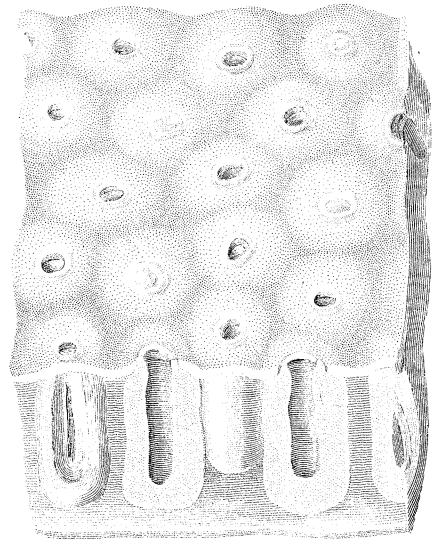

Fig. 9.

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