5. On Secondary Sexual Characters in the *Chiroptera*.

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In the first volume of 'The Descent of Man' (p. 268) Mr. Darwin writes as follows:—"Hardly a single species amongst the Chiroptera and Edentata, or in the great orders of the Rodents and Insectivora, presents well-developed secondary sexual differences. . . . ."

I purpose in this paper to inquire into the applicability of Mr. Darwin's statement so far as regards the first of the orders referred to, the Chiroptera; and I hope to be able to show that *several* species in this order present well-marked secondary sexual differences.

As in other orders of Mammalia these differences may be considered under two heads:—

1. Differences in structure.
2. Differences in the colour of the fur.

The first is the most important and constant character; the second is observable in by far the larger number of species possessing secondary sexual characters; but the distinction between male and female in this respect is less well-marked generally in the Chiroptera than in some other orders of Mammalia.

I shall therefore first enumerate and describe the secondary sexual characters depending on structural differences which have been observed in the Bats of the eastern hemisphere.

Among the *Rhinolophidæ*, or Horseshoe Bats, the species of the genus *Phyllorhina* present most remarkable secondary sexual characters. The males of sixteen species are provided with a peculiar frontal sac, placed immediately behind the erect portion of the transverse nose-leaf. The sides of this sac are usually covered with a peculiar waxy secretion; and a pencil of long, fine, black hairs arising from the bottom of the sac projects for about half its length from its mouth. "This cavity," remarks Mr. Elliot (quoted by Blyth *), "the animal can turn out at pleasure, like the finger of a glove; it is lined with a pencil of stiff hairs, and secretes a yellow substance like wax. When alarmed, the animal opens this cavity and blows it out, during which it is protruded and withdrawn at each breathing." In the females this frontal sac is quite rudimentary, consisting only of a slight depression in the skin of the forehead surrounded by a cutaneous ring. From the bottom of this depression hairs project, as in the males, but are much finer and shorter.

In every known species of *Phyllorhina* a small, wart-like glandular elevation, covered with fine straight hairs, and having on its summit two small apertures, exists on either side of the forehead behind the transverse nose-leaf, slightly internal to and above the eye. Between these glandular prominences the frontal sac is placed in all species so provided. In the adult males of *P. armigera*, Hodgs., the wart-

* Journ. Asiatic Soc. of Bengal, vol. xiii. p. 487.

like elevation on each side is enormously developed, forming a large callosity, extending forwards in front of the eye, and backwards to the posterior margin of the opening of the frontal sac. These, with the raised and swollen margins of the opening of the frontal sac, form on the forehead a naked, livid, triangular space, extending from the transverse nose-leaf backwards between the ears. The adult female possesses, as in other species, a very rudimentary sac, placed close behind the transverse nose-leaf; and the small wart-like elevations on either side are almost concealed by the hair of the forehead.

Fig. 1.

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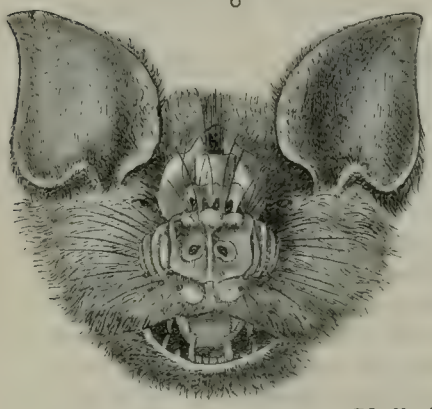

Fig. 2.

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Phyllorhina armigera.

The drawings well represent the relative development of the parts referred to above in the male and female *P. armigera*. The original drawings have been made from specimens in the Indian Museum.

I have observed a similar development of these glandular prominences in an adult male specimen of *P. larvata*, Horsfield, from Assam; but in all other apparently adult specimens of this species in the Indian Museum they are not larger than in other species of *Phyllorhina*. The question therefore arises whether this enlargement of the glandular elevations, with proportional development of the frontal sinus in the male, depends on season, or on the age of the individual, or on both.

Mr. Blyth remarks, in a footnote, on the frontal sinus of Bats of this genus (Journ. As. Soc. Beng. vol. xiii. p. 487):—"It is probable that the development of this sinus, and also of the throat-sac of the *Taphozoi*, depends much on season, like the infraorbital cavities of various ruminants and analogous glandulous follicles in many other animals."

The development of the frontal sinus and glandular prominences being primarily a sexual character, I believe that the relative development of these parts among males of the same species is dependent on both age and season. I have always found the frontal sac in aged individuals greatly developed; the development of the

glandular eminences on either side is probably more connected with season. In a large number of male specimens of *P. larvata*, Horsfield, from Burma, obtained at the same time, in which the testes lie in a false scrotum formed by the skin of the perinæum, the glandular eminences on either side of the frontal sinus are not more developed than in the females; while the frontal sac is very large, contrasting remarkably with the rudimentary one in the other sex. In a specimen from the Kasia hills, in which the testes occupy the abdominal cavity, the frontal glandular eminences are greatly developed (as shown in fig. 3), and their development is evidently

Fig. 3.

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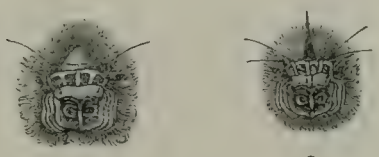
Phyllorhina larvata.

Fig. 4.



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Phyllorhina speoris.

connected with season; for, in the Chiroptera and some genera of Rodentia and Insectivora the testes, during the rut, pass into the abdominal cavity *.

In *P. larvata* and *P. speoris* the external margins of the frontal sac are, in the males, greatly swollen, naked, and elevated considerably above the surface; while in the females the margins of the slight depression in the skin of the forehead, corresponding to the frontal sac in the males, are not more thickened or elevated than in young males of the first year. This is well shown in the illustration above (fig. 4).

In other species, where thickening and elevation of the margins of the frontal sac, or enlargement of the neighbouring glandular prominences do not exist, a permanent secondary sexual difference is found in the depth of the sac, which, in the most adult females, is a mere shallow depression in the skin of the forehead.

The above described remarkable difference between the males and females of *P. larvata* and of *P. speoris*, taken with a slight difference in the colour of the fur, has caused more than one distinguished zoologist to separate the males and females into distinct species †.

It is difficult to assign a use to this protrusible frontal sac. The only other animals possessing apparently homologous organs are the

* See Wagner's 'Comparative Anatomy,' ed. Tulk, p. 56.

† Thus the species *P. insignis* and *P. deformis* were founded on male and female specimens respectively of *P. larvata*; and, similarly, *P. apiculatus* and *P. pencillatus* on *P. speoris*. (For synonymy see Peters in 'Monatsbericht Berlin Akademie,' June 1871, p. 320; also Blyth, Journ. Asiatic Soc. Bengal, vol. xiii. p. 481.)

male Sea-elephant (*Macrorhinus proboscideus*) and the Bladder-nosed Seal (*Cystophora cristata*); and Mr. Darwin, when referring to the sexual peculiarities of these animals, does not suggest any use for the remarkable structures possessed by the males; but cites Lesson, who "compares the erection of the proboscis [in *M. proboscideus*] to the swelling of the wattles of male gallinaceous birds whilst they court the females"*.

I am disposed, however, to regard the protrusible frontal sac of the male Phyllorhine Bats as a more specialized structure than the erectile nose of *M. proboscideus*, or the inflatable skull-cap of *C. cristatus*. The peculiar finger-like appearance of the everted sac, armed at the extremity with a pencil of long straight hairs, seems to indicate that it acts as a delicate organ of touch, and is probably used by the male for exciting the female; supplementing, in this respect, the very imperfect eye-sight† of these animals, as the highly sensitive wing-membrane and expanded foliaceous nasal appendages supplement the same in their search for food, enabling them also to avoid obstacles even in the darkest caverns and when totally deprived of the little sight they possess.

In the genera *Megaderma* and *Rhinolophus* the females only possess peculiar pubic warts, resembling teats, which have been described by Temminck and other zoologists. Temminck regards them as odoriferous glands, in no manner connected with the function of nutrition, and writes:—"J'ai soumis un grand nombre d'individus de plusieurs espèces différentes à l'examen de ces parties, et le résultat m'a pleinement convaincu que ces mamelons ne servent en aucune manière à la nutrition, ce sont des appendices d'où suinte une matière onctueuse, fétide; cet appareil doit servir à augmenter l'odeur désagréable que ces animaux exhalent, et paraît destiné aux mêmes fins que les siphons ou les glandes odorifères observées dans plusieurs espèces de Cheiroptères"‡.

These pubic warts, if Temminck's remarks be correct, present another very interesting secondary sexual character; but, although I have examined a large number of specimens of *Megaderma lyra* and of various species of *Rhinolophus* preserved in spirit, I am unable to assert positively, as Temminck has done, that they are in no respect connected with the function of nutrition. To determine this question it would be necessary to examine recent specimens obtained during the season of lactation.

Dr. Anderson, Curator of the Indian Museum, during a collecting-tour in Lower Bengal, obtained at Purneah a large number of specimens of the females of *M. lyra* with their young; and the following remarks occur in a letter received by me from him on his return to Calcutta:—"All the young, even the largest, were adherent to the teats, some attached to the abdominal, and others to the pectoral

* Descent of Man, vol. ii. p. 278.

† Mr. Darwin enumerates many instances where he considers the brilliant colours of the fur or feathers of male animals, or other sexual peculiarities, are admired by the females.

‡ Monographies de Mammalogie, vol. ii. p. 3.

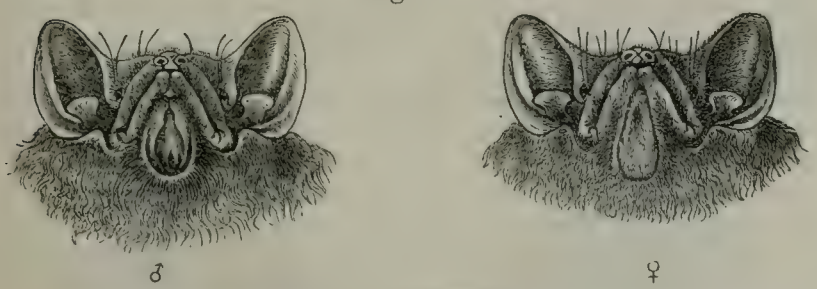
nipples; but I observed that they moved about with great energy from one teat to another. Besides the specimens collected I examined about forty other females; and each had only one young."

Dr. Anderson saw nothing, he informs me, to lead him to believe that the young obtained nourishment from the pubic teats, save that they occasionally attached themselves to them. Probably the young Megaderms held on to these teat-like organs as every young animal will attach itself to any thing resembling the nipple of its mother.

We find the next most remarkable secondary sexual differences among the *Noctilionidæ*, especially in the genus *Taphozous*, Geoff. In this genus the males and females of most species are distinguished by well-marked secondary sexual characters.

In *Taphozous longimanus*, Hardwicke, a species very common about Calcutta, the males are provided with a deep gular pouch, placed between the angles of the mandible, and opening anteriorly by a crescentic margin. This sac contains a yellowish, unctuous, fetid substance, on which the peculiar odour of the animal appears

Fig. 5.



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Taphozous longimanus.

in a great measure to depend. In the female no sac exists, but a thin semicircular fold of skin marks the position of the opening as found in the males. In *T. saccolæmus*, Geoff., a similar sexual difference is met with; but the gular pouch, though relatively much smaller in the female, is not reduced to such a rudimentary condition as in *T. longimanus*. In *T. kachhensis*, Dobson, the gular pouch is represented in the male by a slightly raised semicircular fold of skin (in the position occupied by the opening of the pouch in other species) and surrounding nakedness of the integument; while in the female the skin is quite smooth in the same place.

Thus the transition from species possessing a well-developed gular pouch to those in which it is altogether absent is gradual.

In Dr. J. E. Gray's "Synopsis of the genera of Vespertilionidæ and Noctilionidæ" (Ann. & Mag. Nat. Hist. 1866, p. 92) those species possessing a gular pouch are separated into a distinct genus, under the name of "*Saccolaimus*." According to this principle we should be obliged to place the males of *T. longimanus* in one genus, and the females in another; and, indeed, this is what Dr. L. Fitzinger has lately done.

In his "Critical Analysis of the order Chiroptera"* Dr. Fitzinger has redescribed three species, as *Saccolaimus brevicaudatus*, *S. fulvidus*, and *S. cantori*, Blyth, which had many years previously been recognized by their original describer (Mr. Blyth) as males of *T. longimanus*, Hardw., differing from one another in the colour of the fur, length of tail, and in some other points of no specific importance, dependent on season, age, and locality. These imaginary species have been relegated by Dr. Fitzinger to the genus *Saccolaimus*, distinguished by the possession of a gular pouch; while the females, being without a gular pouch, appear in a separate genus under the names of *T. longimanus*, Hardw., and *T. bicolor*, Temm.

The males of *T. melanopogon*, Temm., possess a peculiar beard of long black hairs, extending from the angles of the mandible backwards to the sternum. This beard contrasts remarkably with the rest of the fur, both in the length of the hairs composing it and in their colour. The usual colour of the fur of the animals of this species is white at the base, with black extremities. The hairs of the beard, however, are black throughout, thicker and longer than the hairs occupying the rest of the body. In the females the portion of the body occupied by the beard in the males is thinly clothed with fur not differing from that covering other parts.

Fig. 6.

Taphozous melanopogon.

The position of the beard, and comparative length of the hairs composing it, are shown in the above woodcut (fig. 6).

Among the *Molossi* the males of some species are provided with thoracic or gular glandular pouches, which are either wanting or less developed in the females. The thoracic pouch of *Dysopes alecto*, an American species, is described by Temminck as follows:—"Plusieurs individus conservés à l'esprit de vin ont servi à nous faire découvrir que l'espèce est munie au thorax d'une poche ou siphon assez large, couvert par un repli de la peau et conduisant à une cavité pourvue de muscles propres, qui servent à la sécrétion d'un fluide onctueux; le bord inférieur de ce siphon est pourvu d'un bourrelet, et la cavité se trouve en grande partie cachée par quelques poils assez longs du devant du cou. Les mâles ont cette ouverture,

* "Kritische Durchsicht der Ordnung der Flatterthiere," Sitzungsber. Wien. Akad. lxi. Abth. i. p. 447 (1870).

mais elle est moins grande chez les jeunes. . . . . Les femelles n'ont point de siphon" *.

The same writer notices the presence of a gular pouch in the males only of *Dysopes obscurus*, and describes the thoracic glandular pouch of *Cheiromeles torquatus*, which differs in structure and is less developed in the female†.

Among the Frugivorous Bats several species present well-marked secondary sexual differences.

The species of the genus *Epomophorus* possess peculiar shoulder-tufts, consisting of long stiff hairs, differing in colour and length from the surrounding fur. These tufts correspond to the position of odoriferous glands, and are either less developed or wanting in the female.

In Mr. Tomes's "Monograph of the genus *Epomophorus*" the form of the shoulder-tufts ‡ in each species is described, but the author does not notice their relative development in the sexes.

In *E. labiatus* = *Pteropus labiatus*, Temm., the absence of the shoulder-tufts in the female is particularly noticed by Temminck §. In. *E. gambianus*, Ogilby, = *E. crypturus*, Peters, these epaulettes are well developed in the male, and are thus described by Mr. Tomes:—"The conspicuous shoulder-tufts of *E. macrocephalus* are here very fully developed. They consist of a very slight warty excrescence clothed with fur, which differs from that which surrounds it only in being of a dirty white colour" ‖. As this description was taken from specimens obtained twenty-five years previously it is most probable that in the living animal these shoulder-tufts present much more conspicuous objects. Judging from the fine coloured illustration, representing the female of this species, in the 'Reise nach Mossambique,' and from the absence of any mention of these epaulettes in Dr. Peters's description ¶, taken from an adult female specimen, we may conclude that in the female of this species also the shoulder-tufts are wanting.

The only known specimen of *E. franqueti*, Tomes, is a male; and the remarkable development of the shoulder-tufts is shown in the illustration accompanying Mr. Tomes's paper referred to above. They are thus described:—"The shoulder-tufts are very much developed, and differ somewhat from those of *E. macrocephalus*. They occupy a space on the shoulder of as much as 1½ inch in length, in a descending direction; the lower half of this space consists of fur, which is of the same length and texture as that of the surrounding parts, but is of a buffy yellow colour; whilst the upper part, constituting the real shoulder-tuft, is composed of long yellow hairs, which spring outwards and then curve downwards, partially

* Temminck, 'Monographies de Mammalogie,' vol. ii. p. 355.

† *Loc. cit.* p. 349.

‡ Well shown in a fine coloured illustration of *E. franqueti*, Tomes, accompanying Mr. Tomes's Monograph of the genus (see Proc. Zool. Soc. 1860, p. 42, pl. lxxv.).

§ Monographies de Mammalogie, vol. ii. pp. 83, 84.

‖ P. Z. S. 1860, p. 53.

¶ Reise nach Mossambique, Säug. p. 26, pl. v.

hiding the short yellow hair already mentioned. All this yellow fur, both long and short, has a clear and well-defined outline"*.

If the shoulder-tufts, so conspicuous in the male, are absent in the female of this species also, as judging from analogy we may expect, we have then three species of Bats of this genus alone possessing secondary sexual characters as remarkable as any known in the class Mammalia.

Temminck describes somewhat similar secondary sexual differences in *Pteropus macklotii*. The male possesses a well-developed odoriferous gland on each side of the neck, covered by a large tuft of stiff unctuous hairs of a bright chestnut colour, contrasting with the surrounding fur. In the female these glands and shoulder-tufts are absent.

The same author thus describes the sexual peculiarities of *Cynonycteris stramineus*, Geoff.:—"Pelage lisse, très-court et rare; région des côtés et du devant du cou ornés d'un demi-collier roux-doré à pinceaux de poils onctueux et divergens. Les teintes de ce collier et des pinceaux de poils courtes et divergens qui existent seulement chez le mâle, varient plus ou moins; l'un des sujets a toutes les parties latérales et le devant du cou d'un teinte jaune-orange encadrée par un bande brune.

"La femelle manque d'appareil onctueux et de poils divergens aux côtés du cou; ces parties sont d'un jaunâtre terne plus ou moins nuancé de brun-clair. Le reste du pelage est le même pour les deux sexes"†.

I have no opportunities here for examining specimens of Bats from the western hemisphere; and very little can be gleaned from the writings of zoologists regarding the occurrence of secondary sexual differences among them. However, Prof. W. Peters, who has contributed so very much to our knowledge of the Chiroptera, has most kindly, in reply to my inquiries, supplied me with some valuable information on this head.

In the American continent and its islands the place of the Rhinolophidæ or Leaf-nosed Bats of the Eastern World is taken by the Phyllostomidæ, which, though possessing well-developed nasal appendages, are in no other respect connected with the former family, but rather with the Noctilionidæ, which they resemble in structure and in their secondary sexual characters.

Dr. Peters notes the presence of a gular sac, as in some species of *Taphozoi*, in the males only of *Phyllostoma hastatum* and in several species of *Molossi*, and adds:—"There is nothing more striking amongst American Bats than the development of a large sac in the humeral membrane of *Saccopteryx*, *Peropteryx*, *Balantiopteryx*, and other genera; and this organ is only found developed in the males, the females having only a rudiment, which is so small that it has been overlooked by most observers until lately."

I have no doubt that, as the species of this little-studied order become better known, as great or, perhaps, a still greater number will

* *Loc. cit.* p. 54. † *Loc. cit.* p. 85.

be found to possess structural differences depending on sex, as have been described in other orders of Mammalia.

It remains now to consider the secondary sexual differences arranged under the second head—namely, differences in the colour of the fur.

As the colour of the fur in Bats, as in other mammals, varies very considerably according to age, season, and locality, it is necessary in comparing males and females to pay particular attention to this fact. Thus the common Flying Fox of Europeans in India, *Pteropus medius*, Temm., varies considerably; and the difference in the colour of the fur of individuals obtained from different localities or the same locality has caused some zoologists to rank them as distinct species, though perfectly similar in structure *. There is probably scarcely a single species of Bat to which this rule does not apply; but the variability of colour is often not noticeable in those in which the fur is of a very dark shade.

It is interesting to observe how Dr. Fitzinger, either from imperfect knowledge or from want of due appreciation of these facts, has reproduced the mistakes of former observers by republishing the names and descriptions of species previously recognized as synonyms of other species, in some cases by the authors themselves. Thus four species of *Rhinolophus* (*Aquias*) are recognized and described (*op. s. c.* p. 192 *et seq.*) which differ from one another only in the colour of the fur. And so we have, according to Dr. Fitzinger, "the grizzled leaf-nosed Bat" (*Aquias luctus*, Temm.), "the reddish leaf-nosed Bat" (*A. eudouxii*, Laplace), "the dark red leaf-nosed Bat" (*A. morio*, Gray), and "the black leaf-nosed Bat" (*A. perniger*, Hodgs.). Except the second named, these forms of *R. luctus* are in the Indian Museum, and they have all been obtained at Darjeeling. Similarly Kelaart's *R. rubidus* et *fulvidus*, which Blyth had shown to be indentical with *R. affinis*, Horsf., are restored on the same grounds—difference in colour.

The examination of many specimens of these Bats has shown me that, where male and female specimens of the same species have been obtained at the same time and place, the lighter-coloured specimens are invariably males. This confirms Dr. J. A. Allen's observation regarding some species of American Bats †. Thus a male specimen of *R. luctus* from Darjeeling, in the Indian Museum, answers in every respect to the original description of *R. morio*, Gray; while several females from the same locality, and taken at the same time, are wholly black, and belong, therefore, according to Fitzinger,

* Dr. J. E. Gray notices the variability of colour in specimens of the same species found in the same locality as follows:—"There is a general similarity in the colouring of the majority of the species; specimens found in the same locality or island often vary considerably from one another, even when the examination of the skull and teeth show that they are of the same species. On the other hand, specimens from different localities often resemble one another so much in their external colouring that it is difficult to distinguish them in any description that can be made; but when the skulls and teeth are examined they prove to be very different species." ("Revision of the Genera of Pteropine Bats," Proc Zool. Soc. Lond. 1866, p. 65.)

† Quoted by Mr. Darwin, 'Descent of Man,' vol. ii. p. 286.

to a distinct species, *R. perniger*, Hodgs.; others are black, sprinkled with silvery grey, and must therefore, according to the same authority, be relegated to a distinct species. But the closest examination fails to detect any structural difference other than sexual between these specimens from Darjeeling. The "reddish leaf-nosed Bat" of Fitzinger, *R. eudouxii*, Laplace, from the Philippine Islands, is most probably the male *R. luctus*, its brighter colour depending on locality, and perhaps, in a less degree, on season.

In the Journ. As. Soc. Beng. vol. xli. p. 220, I have shown the identity of *Phyllorhina fulva*, Gray, with *P. murina*, Gray, and *P. cineracea*, Blyth, and have expressed my belief that *P. atra* et *atrata*, which differ from *P. fulva* also only in the colour of the fur, are referable to the same species. Later, in the Proc. As. Soc. Beng., Aug. 1871, p. 155, I have remarked that the rich golden hue of the fur of some specimens of *P. fulva* depends most probably on sex and season, seeing that, of several specimens possessing this golden colour examined by me, all were females and each contained a more or less developed fœtus. In the same paper I have adduced evidence which now satisfies me that this golden colour is only possessed by the females, and by them only under certain circumstances, as when in the pregnant condition.

Mr. Blyth, who, in common with other zoologists, regarded the golden-coloured specimens of *P. fulva* as representing a species distinct from the white and black specimens, writes as follows:—"This is perhaps the most vividly coloured of the whole class of Mammalia; at least I know of no species which can at all compete with it for brilliancy of hue. The colour of the fur is here alluded to; for that of the naked skin of the Mandrill and of certain *Cercopitheci* can scarcely be surpassed. The general tint of the fur is splendidly bright ferruginous, that of the upper parts being slightly tipped with a darker shade; membranes dusky." To this Mr. Blyth adds:—"Inhabits Southern India, where very rare"*.

The comparative rarity of the golden-coloured specimens is easily explained when we know that this colour is only possessed by the females of *P. fulva*, and by them only under certain conditions.

I believe the same change occurs in the breeding-season among the females of *Nycticeius temminckii*, Horsf., the commonest Bat about Calcutta. The usual colour of this Bat is pale straw-colour on the under surface, sometimes almost white. This colour I have observed in male and female specimens from all parts of India; but in females obtained in the months of March and April I found the prevailing hue to be rich saffron-colour, exceeding that of the Canary bird.

Among the Frugivorous Bats the same rule appears to hold good, that the females are always darker in colour than the males of the same age. This I have constantly observed in *Pteropus medius*, Temm. Also in a *Pteropus* from the Andamans † and Nicobars the females

* Journ. As. Soc. Beng. vol. xiii. p. 489.

† Distinguished by the form and size of its ears from *Pt. medius* and other allied species, probably *Pt. nicobaricus*, Schriczer, Novara Expedition. The first

are generally of an intensely black colour throughout; in a few specimens only, of apparently very aged individuals, the fur on the back of the head and neck has a slightly reddish tinge; while the males have the whole back of the head and nape of the neck to the shoulders bright orange or pale yellow (very rarely, in old males, reddish brown) as in *Pt. medius*, contrasting as remarkably with the sombre hues of the females as the brilliantly coloured skin of the male Mandrill contrasts with the same parts in the other sex.

A review of the varieties of secondary sexual characters exhibited by various species of Chiroptera described in the foregoing pages shows that in almost all cases these differences depend on the possession by the male (rarely by the female) of accessory organs, generally odoriferous glands, used probably for the purpose of bringing the sexes together during the rutting-season, or for exciting the female; and this might be expected in animals in which the power of vision is almost entirely supplemented by an extraordinary development of the senses of touch and smell.

Differences, depending partly or entirely on the possession by the male of fur of a much more brilliant hue, or distinguished by different markings, or by the greater length of certain portions, are met only, to any appreciable extent, in the Frugivorous Bats, in which the sense of sight is well developed*.

The inference that will naturally be drawn from a perusal of this paper will be, not only that many species of Chiroptera possess well-marked secondary sexual characters, but also that several species exhibit as remarkable differences in this respect as any that have been observed in the whole class Mammalia.

The danger of generalizing statements from imperfect data is thus strikingly illustrated; and we are reminded of the old axiom in logic which biologists, both great and small, would do well to keep ever before their minds:—"A particulari ad universale argumentum non est."

The science of life is yet in its infancy. Man has existed for thousands, perhaps millions, of years upon the earth; but the grand question of his origin and of that of other animals is believed by many distinguished biologists to have already been finally settled from a consideration of a few facts collected within the past half century, most of them within the past decade.

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specimen I received, a female with intensely black fur throughout, was sent me by Mr. Homfray, Assistant Superintendent, Port Blair. Other specimens, male and female, were obtained by me in May last near Port Blair; and Mr. Homfray has since sent me from the Nicobars specimens of the common Flying Fox of these islands, which I find in no respect different from the Andamanese species.

* The beard in the males of *Typhozous melanopogon* evidently depends on the presence of a subcutaneous gland, in the position occupied by the gular pouch in other species of the genus, which discharges its secretion by minute pores. The long black hairs forming the beard grow about these pores, their coarseness and length depending on the glandular secretion by which they are abnormally nourished.

The length of the hair composing the epaulettes of the *Epomophori* is probably due to the same cause; but its remarkable difference in colour requires another explanation.