

## SWIFTS

### Family MICROPODIDÆ

Vol. I., p. 122; Vol. II., p. 61.

THE swifts (*Micropodidæ*) are well represented in the Peninsula and can easily be recognized by their great powers of flight. The wings are long, projecting far beyond the end of the tail, which is varied in form, being sometimes forked, with the outer tail feathers much the longest, square, or stiffened and provided with bare points (*Chaturinæ*). The bill is flattened, with a large gape and slightly hooked at the tip. The feet are feeble, the toes either all directed forwards, or two backwards and two forwards, or one backwards and three forwards.

The plumage is dull blackish or brownish, sometimes with white bands on the flanks and rump. The tree-swifts (*Macropterygidæ*), which are brighter coloured birds, with ornamental plumes on the head, are now usually regarded as a separate family.

From the swallows, to which they have some superficial resemblance, the swifts are distinguished by many anatomical characters, and externally by the feet, which in the swallows are those of a typical passerine bird.

Being purely insectivorous, the swifts are restricted to the warmer portions of the globe, but many species migrate to the temperate zones in summer and breed there.

The nests are varied in form, but the eggs are always white, without much gloss. The young are hatched naked. Thirteen forms are known from the lowlands of the Malay Peninsula (*Robinson*, Vol. I., p. 122).

The Malayan swifts include several forms of the small, almost uniformly brown swiftlets (*Collocalia*) whose nests are the much-prized edible birds'-nests of commerce. In Malaysia the birds usually breed in huge numbers in limestone caves, often on coastal islands, and they are systematically robbed of their nests by local natives, who are the owners, or lessees, of the caves or the collecting rights therein: the birds are only allowed to rear their young at the second, third or even fourth attempt.

The nests vary much in appearance and "quality" according to the species, the batch to which they belong, and, to a far lesser extent, the locality in which the caves are situated, but the main factor governing the variation is specific. The species producing the finest quality (white nests) make their nests entirely of inspissated saliva: other forms mix feathers and vegetable matter in the saliva, and such "black" nests are less valuable.

In the Malay States the nests are now farmed only in the Tioman Archipelago, but the industry is a minor one compared with, say, that in British North Borneo. In the eighteenth century the King of Kedah granted the licences to collect the nests from the colonies on the small islands off the west coast of what is now Peninsular Siam, but these islands are now within the political boundaries of Siam. Of the species occurring within Malayan limits as defined for the purposes of this book, *C. lowi robinsoni* makes a black nest, and the forms of *C. francica* make white nests. It has recently been demonstrated that the formerly well-known "*C. innominata*" is composite and consists of two distinct forms now known as *C. innominata* and *C. lowi robinsoni*: the nest of *robinsoni* has been identified, but specially directed observation is now required to locate the breeding places and nests of the true *innominata*. The nests, like small half-cups or half-saucers, are attached to the bare rock forming the walls and roofs of the caves: the collecting usually entails hazardous climbing, by natives using primitive apparatus. Most of the nests produced in the Malay Archipelago are exported to China, where they form the basis of the well-known birds'-nest soup, but there is also a well-established retail trade in Singapore.

## KEY TO THE MALAYAN LOWLAND SWIFTS

1	{	Shafts of tail feathers stiffened and lengthened into needle-like points.	2
	{	Shafts of tail feathers normal . . . . .	3
2	{	Larger: wing about 8 in.; rump, brown	} <i>Hirundapus gigantea</i> subspp., p. 123
	{	Smaller: wing about 5 in.; rump, whitish . . . . .	
	{	Throat and rump conspicuously white	4
3	{	Throat and rump not white; rump sometimes rather paler than the back . . . . .	5
4	{	Larger: wing about 7 in.; feathers of under parts conspicuously edged with white . . . . .	} <i>Micropus pacificus</i> subspp., p. 124
	{	Smaller: wing less than 6 in., white edgings on under parts, if present, never conspicuous . . . . .	
	{	Tail very deeply forked . . . . .	<i>Tachornis batassiensis infumatus</i> , p. 124
5	{	Tail square or scarcely forked . . . . .	<i>Collocalia</i> spp., see special key below

KEY TO THE MALAYAN BIRDS'-NEST SWIFTLETS (*Collocalia*)

1	{	Centre of abdomen, white . . . . .	<i>Collocalia linchi cyanoptila</i> , p. 123
	{	Abdomen, brown . . . . .	2

2	Larger: wing, 4.95 to 5.4 in.; tarsus feathered . . . . .	3
		Smaller: wing, 4.5 to 5 in.; tarsus naked, or feathered . . . . .
3	Bill less robust. Tail more deeply forked. Inner edge of wing quills, paler . . . . .	<i>Collocalia innominata</i> , p. 114
	Bill heavier. Tail less deeply forked. Inner edge of wing quills, darker . . . . .	<i>Collocalia lowi robinsoni</i> , p. 115
4	Darker. Rump concolorous with back. Tarsus usually feathered . . . . .	<i>Collocalia vestita vestita</i> , p. 119
	Paler. Rump lighter than back . . . . .	5
5	Rump-patch conspicuous. Tarsus naked . . . . .	<i>Collocalia francica germani</i> , p. 117
	Rump-patch darker. Tarsus variable . . . . .	<i>Collocalia francica amechana</i> , p. 119

*Collocalia innominata*<sup>1</sup>**Hume's Swiftlet**

Vol. I., p. 128 (part); Vol. II., p. 65 (part).

*Collocalia innominata* Hume, *Stray Feathers*, i., 1873, p. 294 (South Andaman Islands); Hartert, *Cat. Birds, Brit. Mus.*, xvi., 1892, p. 503 (part, Andaman Islands specimen); Blanford, *Faun. Brit. Ind., Birds*, iii., 1895, p. 177 (part); Robinson and Kloss, *Journ. Nat. Hist. Soc. Siam*, v., 1922, p. 143 (a composite reference not based on specimens: probably only the Andaman Island reference belongs here); Stuart Baker, *Faun. Brit. Ind., Birds* (2nd ed.), iv., 1927, p. 349 (part).

**Malay Names.**—Layang layang padi; layang layang gua.

**Description.**—A small swift of almost uniform brown plumage, but rump and under side of body paler. Tail slightly forked, the longest tail feather from 0.3 to 0.5 in. longer than the shortest feather. Tarsus covered with small feathers, except on the upper part, behind.

*Adult.*—Sexes alike. Upper parts, dark brown with a faint greenish (on the quills blue-green) gloss in certain lights, darkening to almost black on wings and tail. Crown slightly darker than mantle. Rump distinctly lighter, brownish grey, the feathers with thin blackish shaft stripes. Under parts paler than the upper parts, brownish grey, darker on chin and throat, the whole with thin, almost imperceptibly darker shaft stripes. Bases of feathers on lores whitish and often showing through as an indistinct spot. A very faint supercilium caused by paler edges to a few feathers on the sides of the crown. Under wing coverts, blackish brown.

<sup>1</sup> Since Robinson wrote the first two volumes of this series much work has been done on the difficult group of *Collocalia*, the members of which are very similar in appearance and often not easy to identify by the skin alone.

Dr Erwin Stresemann has demonstrated that the form regarded by Robinson as *Collocalia innominata* is composite and consists of two distinct species. I have therefore written an entirely new account of the species.

*Immature*.—Rather paler than adults: not quite so blackened on the upper surface.

**Soft Parts**.—Iris, brown; bill, black; tarsus, dark brownish flesh; toes nearly black.

**Dimensions**.—Total length, 4.8 to 5.2 in.; wing, 5.1 to 5.4 in.; tail, 2.1 to 2.25 in.; tarsus, 0.35 in.; bill from gape, 0.45 to 0.55 in.; exposed culmen, about 0.16 in.

**Range in the Malay Peninsula**.—The mountains of the Federated Malay States from 2500 to 4800 feet. The One-Fathom Bank Lighthouse in the middle of the Straits of Malacca off the Selangor coast. Also said by Robinson to occur on the coast of Selangor.

**Extralimital Range**.—The Andaman Islands. A rather doubtful specimen from Sumatra is, for the present, referred to this form. This race has also been recorded from Tonkin, but the specimen now needs comparison with *C. l. robinsoni*. It is possible that *C. innominata* should be regarded as a geographical race of the Javan *C. fuciphaga*, but this is not yet fully established.

**Nidification**.—Not precisely recorded. Published records referred by their authors to "*innominata*" are probably composite, or applicable to *C. lowi robinsoni*.

**Habits**.—As all specimens examined from the Malay Peninsula are dated from November to March and with one exception are either from a lighthouse in the Straits of Malacca, where Robinson reported the species as common in November and December 1919, or from montane localities, it seems likely that this swiftlet does not breed on the mainland of the Peninsula and that it is only a winter visitor, although perhaps not migratory in the true, or usually accepted, sense. It is likely that the nests will be found in caves on coastal islands, the birds breeding in company with other species of *Collocalia*.

In the mountains these swiftlets occur in loose flocks, mixed with *C. lowi robinsoni* and also often in close association with numbers of the large spine-tail swifts (*Hirundapus*). Such associations will rove the mountain ranges, the harbingers, literally, of the thunderstorms. From the peaks the storms can be seen approaching from the sea, and then, in the hushed moments preceding the breaking, or arrival, of the heavy rain, the wheeling flocks of swifts appear, right on the edge of the storm, even more active than usual, and flying lower than usual, because of some effect the approaching storm has on the insect-life of the jungle. As the swiftlets sweep past, a characteristic note comes to the ear, just like the striking together of two small pebbles. Travelling before the storm, the birds disappear as suddenly as they came, but they are nevertheless not averse, at times, to flying in the heaviest tropical downpour.

*Collocalia lowi robinsoni*

**Robinson's Swiftlet**

Vol. I., p. 128 (part); Vol. II., p. 65 (part).

*Collocalia lowi robinsoni* Stresemann, *Bull. Raffles Mus.*, 6, 1931, p. 98 (Bélitung Island, south-west of Terutau Island, Straits of Malacca).

*Collocalia innominata*, Hartert, *Cat. Birds, Brit. Mus.*, xvi., 1892, p. 503 (part, specimens from Bankasoon and Mergui, *vide* Stresemann); Blanford, *Faun. Brit. Ind., Birds*, iii., 1895, p. 177 (part); Robinson and Kloss, *Journ. Nat. Hist. Soc. Siam*, v., 1922, p. 143 (a composite reference based on literature, not specimens: probably all references except that from the Andaman Islands belong here); Stuart Baker, *Faun. Brit. Ind., Birds* (2nd ed.), iv., 1927, p. 349 (part); ? Stuart Baker, *Nid. Birds Ind. Emp.*, iii., 1934, p. 471 (part).

**Malay Names.**—Layang layang padi; layang layang gua.

**Description.**—So closely resembling the last-mentioned species, Hume's swiftlet (*Collocalia innominata*), that a detailed description would be superfluous. The present species is of more robust build; the bill and feet are usually larger; the inner edges of the wings are darker; the actual width of the wing quills is slightly greater; and the tail is less forked, the longest tail feather only exceeding the shortest feathers by about 0.2 in. and sometimes less.

**Soft Parts.**—Iris, brown; bill, black; feet, dark brown.

**Dimensions.**—Total length, about 5.3 in.; wing, 4.95 to 5.2 in.; tail, 1.9 to 2.05 in.; tarsus, 0.45; bill from gape, 0.55 to 0.56 in.; culmen, 0.17 to 0.2 in.

**Range in the Malay Peninsula.**—Pulau Bëlitung (Spire Island of the Admiralty Charts), between the islands of Langkawi and Terutau, just on the Siamese side of the Kedah-Siam boundary. Gunong Angsi, Negri Sembilan, 2000 ft. Pulau Tinggi, off east coast of Johore. Records of "*lowi*" from the Anamba Islands in the South China Sea should also, no doubt, be referred to the present form.

**Extralimital Range.**—The coast and coastal islands of Tenasserim. The typical subspecies is Bornean, and a form described from the mountains of Java (*vulcanorum*) is probably only a subspecies.

**Nidification.**—Swiftlets nest in great numbers in the caves of limestone islands off the west coast of Siam and on the limestone island of Pulau Bëlitung, south-west of Terutau in the Straits of Malacca, which, according to Robinson, is riddled with caves. There are also many nesting places in the small islands off the Tenasserim coast. Unfortunately for the systematist, at least two species of swiftlet often nest in the same cave. The smaller of the two species is *Collocalia francica germani*, but we cannot be sure whether published records of the larger species "*innominata*" really refer to that bird or to the newly described *C. l. robinsoni*, formerly not distinguished from *innominata*, or to both forms. Birds examined from Pulau Bëlitung are *robinsoni*, but as from this locality Robinson describes nests as varying from almost pure white to blackish much intermixed with feathers, it seems that more than one species of swiftlet is concerned. According to an official Siamese report, the Bëlitung maker of the black nests seems to have no definite breeding season, as the nests are collected throughout the year, but this is difficult to believe: the same report describes the most ingenious method used by the natives in collecting the nests. A kind of a cage for the collector, made at the top of a mast of stout bamboos lashed together, is erected in the centre of the cave and sup-

ported by stays by the adjustment of which, loosening here and tightening there, the head of the mast can be made to change position in any direction. I have, however, some authentic nests of the present species carefully collected, together with a few birds on Pulau Tinggi, off the east coast of Johore, in July 1928, on which date the nests contained almost full-grown young birds. I cannot distinguish these nests from those of *C. l. loai* taken in Borneo. The yellowish, hardened saliva of which they are composed is much mixed with feathers, and the matrix is greyish in parts. They are, in fact, of the "black," less valuable commercially, type. The nests vary much in size and shape according to the position in which they are built, but they are roughly in the shape of half, or three-quarter, saucers cut away at the back, where they are attached to the wall of the cave and here provided with a thickened rim terminating in two buttresses, or feet. They are usually about 0.75 in. deep, from 1.6 to 2 in. from front to back, and about 2.25 to 2.5 in. across. Properly authenticated eggs are not known to me.

**Habits.**—On Gunong Angsi, in Negri Sembilan, I shot this swiftlet and *C. innominata* from the same flock, and the habits of the two species seem much alike.

*Collocalia francica germani*

**The Northern Grey-rumped Swiftlet**

*Collocalia germani* Oustalet, *Bull. Soc. Phil. Paris*, 1876, p. 1 (Condor Island, off Cochin-China).

*Collocalia inexpectata*, Hartert, *Cat. Birds, Brit. Mus.*, xvi., 1892, p. 505 (part, specimens from Tenasserim and the Malay Peninsula).

*Collocalia francica* (part), Blanford, *Faun. Brit. Ind., Birds*, iii., 1895, p. 178.

*Collocalia francica germani*, Robinson and Kloss, *Journ. Nat. Hist. Soc. Siam*, v., 1922, p. 144; Stuart Baker, *Faun. Brit. Ind., Birds* (2nd ed.), iv., 1927, p. 351; Stuart Baker, *Nid. Birds Ind. Emp.*, iii., 1934, p. 473.

**Malay Names.**—Layang layang padi; layang layang gua.

**Description.**—Smaller than the two preceding species. Rump much paler. Tail deeply forked, the longest tail feather from 0.2 to 0.3 in. longer than the shortest feather. Tarsus naked.

**Adult.**—Sexes alike. The plumage so closely resembles that of *C. innominata* that no separate detailed description is necessary. The present species only differs in that the rump is paler, less brownish grey, sometimes almost whitish and always forming a greater contrast with the dark upper parts than in *innominata*. In fresh plumage very slightly darker, *i.e.* blacker, on the upper parts than *innominata*.

**Soft Parts.**—Iris, brown; bill, black; feet, purplish brown.

**Dimensions.**—Total length, 4.5 to 4.9 in.; wing, 4.4 to 4.8 in.; tail, 1.85 to 2 in.; tarsus, 0.35 in.; bill from gape, 0.45 to 0.55 in.; culmen, about 0.15 in.

**Range in the Malay Peninsula.**—The coast and coastal islands of Peninsular

Siam, including Koh Pennan and Koh Samui in the Bandon Bight. Coast of Selangor. A straggler from the Horsburgh Lighthouse, thirty-three miles east of Singapore, seems also to belong to *germani* and not to the southern subspecies next to be described.

**Extralimital Range.**—Coast and coastal islands of Tenasserim. Pulau Condore and the coast of French Indo-China. Coasts of Sarawak and North Borneo. The Philippines. There are many other subspecies, or geographical races, distributed, chiefly on islands, from Mauritius and the Seychelles to Hupeh and to Queensland and the Marquesas Islands.

**Nidification and Habits.**—This is one of the races of *C. francica* that make the "white," edible birds'-nests of commerce. The birds breed in large numbers in caves in the limestone islands off the west coast of Peninsular Siam, the caves being annually leased to Chinese for a rental in return for the privilege of collecting the nests. Large numbers of birds also breed on small islands between Koh Samui and the mainland; the nests are regularly collected by Chinese. I have no details concerning the nidification from the Peninsula beyond a brief record that on Pulau Bëlitung, west coast Peninsular Siam, the first collection of nests is made in January, but Mr C. Hopwood described them in 1919 from the Mali Islands, a few miles from the Tenasserim coast, between Tavoy and Mergui, just north of our area, where the birds breed in large numbers in company with a larger form called by Mr Hopwood "*innominata*," but which may be *robinsoni*. Mr Hopwood's account is as follows: "*C. francica* makes the edible nests of commerce, which are a Government monopoly, the right to collect them being sold by auction, but the nests of *C. innominata*, though of very little value on account of the large amount of grass and feathers used in their construction, are also collected by the licensee, but are only purchased by the poorer classes. The pure white nests of *C. francica* are worth, at present prices, about Rs. 140 a viss; those of *C. innominata* being worth only about Rs. 5. *C. innominata* is the earlier breeder of the two, commencing nesting operations in February, a few eggs being laid about the first week in March; but *C. francica* does not lay till well on in April, and fresh eggs may be taken as late as the latter half of May, by which time *C. innominata* have all hatched off; and whilst this latter species plasters its nests at random on the walls of the caves anywhere above highwater-mark, *C. francica* always goes to the top of the cave, and places its nests well inside a fissure of the rock. The eggs of *C. innominata* are constantly the larger, measuring on the average 0.94 by 0.62 in., whilst those of *C. francica* average 0.83 by 0.52 in. A very long egg of *francica* may be as long as a very short egg of *innominata*, but is always narrower, and the eggs of the two species can be distinguished with certainty. A difference in the habits of the two is that whilst *francica* leaves the caves at dawn, finds its food over the mainland, and returns to the islands at dusk, *innominata* haunts the caves all day, and the numbers are so great as to recall white ants fluttering round a lamp, and the birds may even be caught by a quick grab of the hand, a feat which we actually saw performed several times."

Mr Stuart Baker gives the measurements of some nests as  $3\frac{1}{8}$  in. longest diameter,  $1\frac{3}{4}$  in. shortest diameter, and about 1 in. deep.

*Collocalia francica amechana***The Southern Grey-rumped Swiftlet**

*Collocalia francica amechana* Oberholser, *Proc. U.S. Nat. Mus.*, lxii., 1912, p. 13 (Jimaja Island, Anamba Islands).

*Collocalia francica inexpectata*, Stuart Baker, *Faun. Brit. Ind., Birds* (2nd ed.), iv., 1927, p. 350 (part: the Malayan references); Stuart Baker, *Nid. Birds Ind. Emp.*, iii., 1934, p. 472 (part: Malayan references).

**Malay Names.**—Layang layang padi; layang layang gua.

**Description.**—Differs from the preceding form. *C. francica germani*, only in that the rump is darker. Tarsus sometimes with a few feathers. Soft parts and dimensions as in *germani*. There is a considerable amount of individual variation in the colour of the rump: in some birds it is almost as pale as in the northern subspecies, *C. f. germani*, but in other specimens it is much darker and only slightly paler than the back.

**Soft Parts.**—As in *C. f. germani*.

**Dimensions.**—As in *C. f. germani*.

**Range in the Malay Peninsula.**—The southern portion only. Specimens examined from Johore and Singapore Island. Also from Pulau Tioman and Tokong Gantang, a group of rocks south-west of and near Pulau Tinggi, in the Tioman Archipelago. Dr H. C. Oberholser records this form under the name of "*C. francica inexpectata* Hume" from "both coasts of the southern part of the Malay Peninsula."

**Extralimital Range.**—The Anamba Islands in the south China Sea.

**Nidification.**—Not precisely recorded. In Singapore I have seen beautiful "white" nests of the finest quality, said to have come from Pulau Tioman, but they could equally well have been nests of the next species to be described, *C. v. vestita*. Robinson found the bird breeding on rocks near Pulau Tinggi on 21st July.<sup>1</sup>

**Habits.**—In the non-breeding season this swiftlet wanders far from its caves and then occurs in flocks on Singapore Island. In January of two years I have found large numbers seeking the shady shelter of large stone-walled rooms, or vaults in buildings, in the late afternoon for roosting purposes: they were then easily caught with a large butterfly-net.

*Collocalia vestita vestita***The Brown-rumped Swiftlet**

*Salangana vestita* Lesson, *Echo du Monde Savant*, x., 1843, p. 134 (Sumatra).

*Collocalia fuciphaga* (part), Hartert, *Cat. Birds, Brit. Mus.*, xvi., 1892, p. 498.

**Malay Names.**—Layang layang padi; layang layang gua.

**Description.**—Very much like the two forms of *Collocalia francica* described in the preceding pages, but the general plumage slightly darker, the gloss rather bluer and less greenish, and the rump concolorous with, not paler than,

<sup>1</sup> Later. There is now a breeding colony of these birds in a much-frequented large building in Singapore.



the other upper parts. Tarsus, in the great majority of birds, with feathers: rarely naked. Tail well forked; the longest tail feather from 0.2 to 0.3 in. longer than the shortest feather.

*Adult*.—Sexes alike. Upper parts, dark brown, becoming almost black on the wings and tail, the body with a faint greenish gloss, but on the quills the gloss is nearer to blue. Under parts a paler brown; under wing coverts darker. A whitish spot on the lores.

**Soft Parts**.—Iris, brown; bill and feet, black.

**Dimensions**.—Total length, about 4.7 in.; wing, 4.5 to 5 in.; tail, 1.75 to 1.9 in.; tarsus, 0.4 in.; bill from gape, 0.45 to 0.5 in.

**Range in the Malay Peninsula**.—The southern portion only. Specimens from Johore and Pulau Tioman.

**Extralimital Range**.—Sumatra and Billiton; the west Sumatran islands of Simalur, Nias and Sipora. The Bornean bird is almost inseparable, but in series is, perhaps, slightly darker: either *C. v. vestita* or the Bornean subspecies (*C. v. maratua*) also occurs in the Natuna Islands, Palawan and Luzon.

**Nidification**.—No details are available from the Malay Peninsula: the bird probably breeds in the Tioman Archipelago, where it has been collected in September. A specimen from Johore was obtained in July.

In British North Borneo, where I have made a special study of this species of swiftlet, it is an extremely fortunate circumstance for the local Government that the birds elect to nest in huge congregations in limestone caves. The nests, made almost entirely of inspissated saliva, which hardens into an isinglass-like substance on its exposure to the air, form the most valuable of the edible birds'-nests of commerce, eagerly sought by epicures, mainly, but not entirely, Chinese. By some the nests are quoted as aphrodisiacal. In British North Borneo they are collected by the native owners, or lessees, at regular intervals and exported, mostly to China. An export tax and a variable royalty enrich the official Treasury. The importance of the industry can be appreciated from the fact that in 1936 the market-value of the collected nests of the present species from one system of caves (the Gomantong caves) was £1130.<sup>1</sup>

The nest itself consists of a half-saucer-like part, variable in size but roughly two inches across and rather less from front to back (the "flesh") and two expanded buttress-like attachments (the "feet"). It is, normally, composed entirely of saliva, but sometimes a few fragments of foreign matter, mostly feathers, are included. When the first nests of the season are taken they are large and thick: they have taken a long time to make and are stained with brownish red. The nests of the second batch are smaller and thinner: they are made more quickly, perhaps by exhausted birds, and being whiter and less stained are regarded as of good quality. The third nest is usually yet smaller, and as it is not taken until after the young are fledged it is much stained and, judged by trade standards, of inferior quality. The commercially ideal nest is white, unstained and entirely free from impurities. It is curious,

<sup>1</sup> In the same year the Gomantong caves produced "black nests" (*Collocalia lowi*) to the value of £2455.

but certainly true, that caves in certain localities produce better nests than those in others. The cause of this is unknown.

I have no Malayan eggs to describe, but they may be expected to be two in number, white in colour and long ovals in shape.

The basis of the birds'-nest industry is that the birds are systematically robbed of their nests and eggs, the eggs perishing in the process of collecting the nests, but ultimately allowed to rear a brood: their persistence in the face of such persecution is remarkable, for the industry seems permanent. According to information I collected in North Borneo, the birds start to build in a normal year in December. Although all the nests are not finished until March, they are harvested over a period of about twelve days, starting from the end of February, which is when eggs are found. Second nests contain eggs fifty or sixty days later and are harvested in May. In theory, the birds are allowed to hatch their third clutch of eggs, and the third, and last, batch of nests is not taken until the young are fledged, about the middle of July. These dates are based on information I collected at the Gomantong caves, but in other caves in North Borneo the dates are different. The incidence of the monsoon on different coasts may account, at least in part, for this variation.

The Gomantong caves consist, in the main, of two huge chambers, one roughly above the other, quite dark in their innermost parts, in a low limestone hill. In one case the large porch-like entrance opens into a spacious, lofty cave strongly reminiscent of the nave of a cathedral. In these caves three species of swiftlet nest in close proximity: the present species; a larger form, *C. lowi lowi*; and a form of the tiny white-breasted swiftlet, *C. linchi*, but the nests of *lowi* are "black," less profitable to collect than "white" nests, and those of the smallest species are composed almost entirely of vegetable matter and are not worth collecting at all. The nests, either singly or in clusters, are attached to the bare rock, and there seems no definite attempt to take advantage of apparently favourable natural projections. Broadly speaking, the three species nest side by side, but it often happens that large patches on certain recesses in the walls and roof of the cave are occupied entirely by one species. Some of the building areas are exposed with the nests clearly visible: other groups of nests are in concavities of the rock and often in total darkness.

Some of the nests can be reached by long bamboo poles, but the majority can only be plucked after a high and often dangerous climb, and looking up from the floor to the heights of the caverns it often seems incredible that men can perform such work, but the climbing apparatus of rattan ropes, ladders and galleries is well, if roughly, made, and the climbers are skilful. Sometimes the climbers descend into the inky darkness of the caves through natural holes in the roof: at other times it is necessary to climb the walls from the bottom to a certain point, after which galleries are hauled up and fixed in position. The collectors, who, where necessary, use torches or long thin candles, put the nests in baskets, and after the descent thread them on a thin rattan. The nests are sold by tender to local Chinese, who ship them to the

best market: most are exported to Hong Kong. By the time the nests reach the open retail market in the cities they are a very expensive luxury. In Singapore poor-quality nests of the present species will not cost much less than \$15 (thirty-five shillings) per "kati" (one and one-third pounds); nests of good quality average about \$30 (£3, 10s.) per "kati," and the best white nests<sup>1</sup> are often priced about \$64 (£7, 9s. 4d.) per "kati."

The death-rate among the young birds in the colonies is high. When they are fully feathered they usually leave the nest and cling to the walls of the cave, and in the early fledgeling stage many lose their grip or fall to the ground in their trial flights and cannot rise again. These, with other unfortunates jostled out of their nests, are drowned or smothered in the guano, starved to death or eaten by rats. On the floors of the caves many corpses and young birds in various stages of helplessness bear witness to the dangers of juvenile life. Large birds of prey, especially the brahmyn kite, numbers of which are always to be seen near the caves, are the enemies of the swiftlets, which seem to live in comparative harmony with the myriads of bats inhabiting the same caves.

**Habits.**—Although not truly migratory, many of the swiftlets are certainly subject to local movements during the year, but others seem to use the breeding places for roosting purposes throughout the year. Judging from stomach contents, kindly examined by Mr H. M. Pendlebury, the food appears to consist almost exclusively of winged ants (*Hymenoptera*) belonging to the subfamilies *Myrmecinae* and *Camponotinae*, of which the only determinable species were *Collopsis stricta* Jerd., which was dominant, and *C. augusta* Mayr., which was less numerous. Other fragments of food were recognized as parts of small dragon-flies (*Drepanosticta*) and a small green stink-bug, *Plautia fimbriata*. These insects are, of course, not exclusively cave insects, but are open country and jungle species.

**Note.**—I have included this species in the avifauna of the Malay Peninsula with a certain amount of doubt, and further information concerning the status of the various *Collocalia* forms in the south of the Peninsula is much required: notes on the nidification of the birds in the Tioman Archipelago would be especially useful. Dr Erwin Stresemann, who has made a special study of these swiftlets, considers that *C. vestita* is only a geographical race of *C. francica*, and he regards the rather mixed assemblage of birds, some with dark and others with pale rumps, some with naked and others with feathered tarsi, found in the south of the Malay Peninsula, the Tioman Archipelago and the Anamba Islands as intermediates between the pale-rumped *C. f. germani* in which the tarsi are naked, found normally in the Peninsula as far south as Selangor, and the dark-rumped *vestita* of Sumatra in which the feet are usually feathered. Dr Stresemann's view may be the correct one, but I have already pointed out that in North Borneo the two quite distinct forms *germani* and "*vestita*" (= *maratua*) nest within a few miles of each other: it seems reasonable, therefore, to regard them as species, and to *vestita* I have referred the few dark-rumped specimens obtained in Johore,

<sup>1</sup> In this case more often nests of *C. francica* forms than those of *C. vestita*.

etc.; the remainder—that is, the pale-rumped birds—forms a fairly uniform series, darker on the rump than *germani*, and it is convenient to use for them the name proposed by Dr H. C. Oberholser, *amechana*.

*Collocalia linchi cyanoptila*

**The Malayan White-bellied Swiftlet**

Vol. II., p. 66.

Upper parts, glossy black with a blue-green sheen. Chin, throat, breast and flanks, grey, the feathers with whitish margins; centre of abdomen, white; under tail coverts, black, margined with white.

Total length, about 5 in.; wing, about 4 in.

Not rare in the lowlands, where it is likely to turn up almost anywhere, although, normally, it is very locally distributed. It is commoner at the hill stations than in the lowlands.

On Fraser's Hill Mr G. C. Madoc has found the nest, containing two eggs, in July, plastered to the side of a roof-beam in a zinc-roofed outhouse. In October, in the same locality, he found other nests attached to the cement under the porch of the Government Rest-house. The nests appeared to be made entirely of green water-weeds plastered together with saliva.

Mr Madoc also writes the following interesting note:—"Kuala Lumpur. At the high-level reservoir, Ampang, I observed numbers of swiftlets entering and leaving a long culvert which leads the overflow water through the hillside. On entering the tunnel, which was about five feet high, I found a large colony of swiftlets' nests plastered to the vaulted roof. None of the nests was less than fifteen yards from the mouth of the tunnel. There were many hundreds of them stuck one on top of the other. In a few of them I found fully fledged young birds, and in others there were eggs, mostly fresh. Some contained only one egg, but the typical clutch appeared to be two. The nests measure two inches in diameter and most of them are less than half-an-inch deep. They appear to be composed of water-weeds and a few feathers liberally cemented with saliva. The eggs have a somewhat delicate shell and vary considerably in size and shape. They are slightly pointed at one end and some are very long and thin with blunted ends. The average size of ten eggs is 0.71 by 0.47 in. The greatest variations are 0.78 by 0.50 in. and 0.64 by 0.45 in. The shell is slightly glossy and when fresh the eggs have a beautiful pink tinge" (1st October 1936).

*Hirundapus gigantea gigantea*

**The Large Spinetail Swift**

Vol. I., p. 123.

Lores, dark brown. Top and sides of the head, wings and tail, shiny black with greenish-blue reflections. Remainder of upper and lower parts, dull brown except the under tail coverts and a stripe on the flanks, which are

white. Shafts of the tail quills much stiffened, the spines projecting beyond the vane of the feathers.

Total length, about 9.25 in.; wing, 8 in.

A wandering bird, often common in various localities in the lowlands, and with a habit of turning up almost anywhere, but most usually seen in flocks over the hills. The flight is extremely powerful. There is no local record of the nest and eggs. An allied subspecies, *H. g. indica*, in which the lores are white also occurs in winter. Intermediates between *gigantea* and *indica* are common.

*Rhaphidura leucopygialis*

**The Grey-rumped Spinetail Swift**

Vol. I., p. 124.

Plumage, black with a steel-blue gloss. Rump and upper tail coverts, greyish white with thin black shaft stripes.

Total length, about 4.7 in.; wing, 4.8 in.

This bird, the smallest of the spine-tailed swifts, is fairly common in many parts of the Peninsula but rare or never seen in others. In my experience it is commonest along the courses of large rivers where these pass through forest, or near water when this is not far from forest. The nest and eggs are unknown.

*Tachornis batassiensis infumatus*

**The Eastern Palm-Swift**

Vol. I., p. 126, pl. 10.

Plumage sooty brown, darkest on the upper parts and palest on the throat and turning to glossy black on the wing quills.

Tail long, slender and much forked, the latter feature distinguishing the species at once from the superficially very similar swiftlets of the genus *Collocalia*.

Total length, about 4.6 in.; wing, 4.6 in.

This tiny swift is widely distributed in the lowlands of the Peninsula, but is commonest in the north. It is associated with certain tall palms (*Borassus*, *Livistona*, *Areca*), to the broad leaves of which the tiny, cup-like nests are attached.

*Micropus pacificus pacificus*

**The Large White-rumped Swift**

Vol. I., p. 124.

Chin, throat and rump, white; remainder of plumage blackish brown, palest on the head, darkest, almost black, on the upper tail coverts, and with the dark under parts narrowly barred with white.

Total length, about 7 in.; wing, about 7.2 in.

A migrant, common in the lowlands during the winter months and usually seen in flocks, very high in the air, from the open country. Certain darker birds in which the green gloss is more marked and the rump band narrower answer to the description of *M. p. cooki* described from the North Shan States. There is no local record of the nest and eggs of either race.

*Micropus affinis subfurcatus*

**The Malay House-Swift**

Vol. I., p. 125, pl. 10.

Plumage, black, turning to dark brown on the top of the head and on the wings. Chin, throat and rump, white with a few dark shaft stripes.

Total length, about 6 in. ; wing, 5.5 in.

This is the common swift of towns and settlements in the Peninsula. The masses of nests are usually plastered against the walls of buildings.

Family HEMIPROCINITIDÆ

**Tree-Swifts**

Vol. II., p. 67.

THOUGH belonging to the same order, the tree-swifts fully merit separation from the other swifts (*Micropodidæ*) as a distinct family. Apart from certain anatomical distinctions, they differ from the other swifts in numerous external characters, amongst which may be mentioned the much longer tail and shorter wing and a very short tarsus. The plumage is brighter than that of the other swifts and very soft ; the head is crested in some species and adorned with white moustachial plumes in others ; the sexes differ slightly in plumage and that of the young bird is very distinct. Flight is less powerful than in the *Micropodidæ* and the birds perch on high outstanding branches. The nidification is very peculiar, the nests being very minute for the size of the bird. Only one egg is laid, white or greyish white in colour. The family consists of one genus only, ranging through Southern Asia and the Malay Archipelago to the Philippines, New Guinea and the Solomon Islands, but not to Australia. Two species are Malayan (from *Robinson*, Vol. I., p. 67).

KEY TO THE MALAYAN TREE-SWIFTS

I	{	Crest very distinct ; no white mous-	}	<i>Hemiprocne longipennis harterti</i> ,
		tachial plume		p. 125
		Crest very short ; a white moustachial		<i>Hemiprocne comata comata</i> , p. 126
		plume . . . . .		

*Hemiprocne longipennis harterti*

**The Malayan Crested Tree-Swift**

Vol. II., p. 67.

Head crested. Upper parts, bronzy green, changing to black with a blue sheen on the wing quills. Lower back, rump and ends of the scapulars,

grey. Throat, breast and sides of the body, grey; centre of abdomen, white. The ear coverts are chestnut in males and green in females.

Total length, about 8 in.; wing, about 6.6 in.

A very common bird in the Peninsula, where it is found in small parties in a great variety of situations. It is common in mangrove facing the open sea, along the river-courses through forest, in the hill-clearings and often on the outskirts of the settlements and towns. The presence of some tall trees seems to be its chief requirement. Often it is found near water. The tiny, half-cup-like nest attached to a thin branch at the top of a tree has been found in Negri Sembilan by Mr V. W. Ryves. Eggs in March and May.

The early plumages of this bird are not mentioned in Vol. I., but are distinctive enough to merit notice. As far as I can make out from a late juvenile in which the quills are still largely in sheath, the first plumage is white to greyish white, the feathers with dark subterminal bars varying in colour from dusky to pale rufous. In a later stage the under parts are still largely white but the upper parts are clothed with feathers like those of the adult, but with rufous subterminal bars and white edges. Young birds are very rare in collections.

### *Hemiprocne comata comata*

#### The Tufted Tree-Swift

Vol. II., p. 68.

*Cypselus comatus* Temminck, *Pl. Col.*, 268, 1824 (Sumatra).

*Macropteryx comata*, Hartert, *Cat. Birds, Brit. Mus.*, xvi., 1892, p. 517; Blanford, *Faun. Brit. Ind., Birds*, iii., 1895, p. 182.

*Hemiprocne comata comata*, Robinson and Kloss, *Journ. Nat. Hist. Soc. Siam*, v., 1922, p. 145; Stuart Baker, *Faun. Brit. Ind., Birds* (2nd ed.), iv., 1927, p. 357; Stuart Baker, *Nid. Birds Ind. Emp.*, iii., 1934, p. 477.

**Malay Name.**—Layang layang berjambul.

**Description.**—General plumage, bronze with blue head, wings and tail. Two conspicuous stripes on head, white, ending behind in long tufts.

*Adult male.*—A narrow white frontal band passes into a broad white superciliary stripe, which is continued a long way behind the eye; chin, white and continuous with a white moustachial stripe about the same length as the superciliary; lores, black; ear coverts, chestnut; sides of the head behind ear coverts, point and sides of throat, and crown, dark metallic blue with a purplish gloss. Mantle, back, upper tail coverts, breast and abdomen, brownish bronze, very slightly greener on the throat, and less glossy on the abdomen. Under tail coverts and a few feathers on the lower abdomen, white. Tail, under wing coverts, axillaries and wings, dark metallic blue; a few of the innermost secondaries with white on the inner web, and perhaps some under scapulars with broad white tips, form a white spot seen even in the undisturbed plumage.

*Adult female.*—Ear coverts blue like the sides of the head, not chestnut.

*Immature.*—Inner wing quills with narrow white fringes; more white on the abdomen than in adults; under tail coverts with buff tips.

*First plumage.*—"A very young bird . . . has faint remains of pale brownish edges to the feathers of the upper parts and abdomen, and clear white edges to the tips of the quills; some parts of the abdomen, concealed by the bronze feathers of the adult, show the buffy white plumage of the nestling" (*Hartert*).

**Soft Parts.**—Iris, brown; bill, black; feet, black, dark brown, or blackish crimson.

**Dimensions.**—Total length, 5·8 to 6·2 in.; wing, 4·6 to 4·9 in.; tail, 2·9 to 3·1 in. (the tail is strongly forked and the long, outer tail feathers are about 1·5 in. longer than the shorter, centre feathers); tarsus, 0·26 in.; bill from gape, 0·6 to 0·7 in.

**Range in the Malay Peninsula.**—The mainland from north to south, Singapore and neighbouring islets, but not recorded from any of the other islands.

**Extralimital Range.**—Ranges north to the extreme south of Tenasserim, South to Sumatra and the adjacent islands including those on the west coast; Borneo and the Natuna Islands. In the Philippines this form occurs on Sibu, Sulu, and Tawi Tawi, and the remaining islands of the Philippines are occupied by almost indistinguishable subspecies.

**Nidification.**—Shelford in 1916 was the first to record the curious breeding habits: "The nest . . . is a tiny cup of feathers and down closely cemented together with mucin, and the single pure white egg . . . fits accurately into it. The nest itself is attached to some slender twig at the top of a lofty tree, and in a stiff breeze it must be jerked to and fro to a considerable extent, exposing the egg to not a little danger when the mother is not actually protecting it with her body." Shelford even went so far as to suggest that "the egg is partially secured in position by an excess of the mucilaginous matter with which the substance of the nest is cemented together." Mr Stuart Baker mentions that "Kellow obtained one nest and egg for me near Simpang [Perak], in the Federated Malay States. The nest was taken from a thin branch of a tree, about 40 feet up, which stood in country more open and heavily wooded rather than forest.

"The nest is a shallow saucer of pure inspissated saliva with just one tiny scrap of moss attached to one side. It is made exactly like the nests of the Edible-Nest Swiftlets, innumerable threads of pure hardened saliva criss-crossing one another in all directions and partially melting into one another. It measures  $1\frac{5}{8}$  inches at the side attached to the branch and juts out about  $1\frac{1}{8}$  inches from it, while in depth it is only  $\frac{1}{8}$  inch, the depression in the centre hardly visible. It seems incredible that the nest could have retained the egg in it even when the parents were sitting, and they could certainly have never left it for a moment.

"The egg is practically white with only the faintest tinge of grey and may be abnormal in colour." The egg measures 1 by 0·6 in. (*Stuart Baker*); 0·8 by 0·6 in. (*Shelford*).

**Habits.**—Fairly common throughout the lowlands of the Peninsula almost everywhere where there are tall trees, but normally not a bird of the village



areas and with a bias to the old forest. It rarely, if ever, ascends the hills above 2500 feet. It is often conspicuous in well-wooded but open country, but especially so along the courses of the larger rivers where these run through forest. From the slender, topmost branches of tall trees it hawks for insects in the manner of a flycatcher and usually in company with several other birds of the same species.