

Pollination: self-pollination, wind, insects, birds?—there is little information on this subject among tropical plants.

Vital statistics: seed production in relation to life cycle—how many seeds per fruit and per plant and are they viable?

Conditions for germination of seeds:...dormancies are common among the seeds of temperate plants but little work has been done on tropical plants in this connexion—some (perhaps many) tropical plants have the reverse of a dormancy, in the sense that they must germinate at once or die (e.g. cocoa).

Distribution of seed: wind, water, animals?—among the last, man is very important for his habit of carrying weed seeds around the world as impurities in agricultural seed samples and for his habit of wearing woollen stockings or long trousers with turn-ups.

Enemies: pests, diseases, other animals?—man is, once again, important for he is certainly the principal enemy of forests and the principal creator of non-natural habitats.

History: a native or an introduced plant or, perhaps, native but still spreading?—some of the Guiana plants known at present only from southwest Trinidad may represent recent colonizers which will yet spread into other parts of the island.

Uses: timber, tans, thatching or plaiting, bush medicine?

I think we can conclude by saying that the amateur contribution to botany can best be made in fields in which specialized equipment and knowledge are not necessary—indeed, may sometimes be a positive hindrance! For this reason I would exclude most experimental studies (except perhaps, simple garden cultivation) and I would also exclude straightforward taxonomy as being unsuitable for the amateur effort. I can think of no approach more suitable for the amateur than what we may call the natural history approach, and, within these limits, no studies are potentially more productive than those of phenology and general field biology along the lines indicated.

BIRD NOTES FROM THE ARIMA VALLEY, WITH THREE NEW RECORDS FOR TRINIDAD.

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THE following notes are based on only six months' observations, from January 20th to March 3rd 1956, and from March 4th to the end of July 1957. They have been selected either because they appear to be new records for Trinidad, or because records of the species concerned are far from adequate and additional information on their status is worth reporting. For nomenclature I have followed Belcher & Smooker's series of papers in the *Ibis* (1934-1937), the most complete recent account of the birds of Trinidad. Most of the observations have been made near Simla, the New York Zoological Society's Field Station at 800 ft. in the Arima Valley.

Fregata magnificens, Frigate-bird. Frigate-birds have been seen many times in February, March and April passing from west to east high over the valley in the late afternoon, singly or in small parties of up to six. They fly at or beyond the limit of visibility to the naked eye and are best picked up and followed with field glasses. Undoubtedly those seen have been only a small fraction of the total numbers passing. Presumably this is part of a regular daily movement between feeding and roosting places, the birds using the hot updraughts coming up from the Northern Range for their homeward glide in the evening.

Oreopeleia montana, Red Ground-dove. Seen fairly often in forest at 500-1000 ft. Not difficult to observe at close quarters, as they rarely fly more than thirty yards when flushed, and will remain still for some time where they land if the observer also keeps still. On two occasions I have watched one, from a hide, feeding among the display courts of Black-and-white Manakins. They apparently come specially to feed on the seeds which the manakins regurgitate and drop onto the ground below their perches, as also do tinamous and Grey-fronted Doves (*Leptotila rufaxilla*).

Anthoscenus longirostris, Starthroat.

Florisuga mellivora, Jacobin.

Lophornis ornatus, Tufted Coquette.

These three humming birds, generally considered uncommon, are fairly frequently to be seen round Simla. The Jacobin is the only one I have seen in forest, away from the garden.

Chloroceryle aenea, Pygmy Kingfisher. One was seen on a tributary of the Arima River at about 600 ft., April 21st 1957. The larger species, *C. americana*, has been seen several times, but can hardly be called common.

Xenops rutilus, Streaked Xenops. Seen several times, and apparently not uncommon, from 500 to 1500 ft., but it is inconspicuous and silent, and very easy to overlook.

Attila spadiceus, Polymorphic Attila. One was seen swooping for insects above a column of army ants by a stream at 500ft., April 18th 1957, and a pair was seen on Spring Hill Estate at 1200 ft., in June. The loud ringing call of this species is characteristic and may be heard from a long way off; it is a sequence of double notes, getting louder and louder and ending with a single very loud note.

Pachyrhamphus polychopterus, Kaup's Becard. Not uncommon round Simla, nor, I suspect, elsewhere where there is the right mixture of cultivation and second-growth. Its presence is most readily detected by the male's call, a series of short, incisive whistles with a characteristic rhythm.

Nuttallornis borealis, Olive-sided Flycatcher. Dr. William Beebe collected a specimen of this migrant flycatcher at Simla on March 20th 1951. This is a new record for Trinidad.

Leptopogon superciliaris, Venezuelan Leptopogon. This flycatcher, which was not discovered in Trinidad until 1925, is not uncommon along streams in the Arima Valley. The best way to find it is to look for the hanging nests under overhanging banks by the side of a stream: I have rarely seen the bird away from the nest.

Mimus gilvus, Mockingbird. When Belcher & Smooker wrote, the Mockingbird had reached ten or twelve miles along the main road east from Port-of-Spain. It now occurs on Waller Field, as far east as Valencia, and has penetrated four miles up the Arima Valley, though there are few spots in the valley that are suitable for it.

Dendroica striata, Blackpoll Warbler. Dr. Beebe has several records of this migrant warbler round Simla in the winter and early spring months. I have not yet seen it in the Arima Valley, but saw a male near Sangre Grande on April 2nd. Apparently it winters in some numbers in Trinidad but has not been recorded before.

Dendroica castanea, Bay-breasted Warbler. I saw a male nearly in full breeding plumage at Simla on March 8th 1957. This migrant warbler, whose winter range includes Panama and Colombia, has not been recorded before from Trinidad.

Habia rubra, Cardinal Ant-tanager. One of the characteristic birds of forest at 500-1800ft., nesting along the banks of streams. It keeps low down and is not always easy to see, but one rarely walks far along a forest trail without hearing its harsh ratchet-like call.

Piranga rubra, Summer Tanager. A striking all-red tanager, with a pale yellow-brown beak, was seen on July 30th by myself and two other observers at the pass at the head of the Arima Valley, 1800 ft. It can only have been a male Summer Tanager, a species previously recorded only as a rare migrant from the north. Further observations of this species are needed.

NOTES ON THREE HUMMINGBIRDS*

BY G. A. C. HERKLOTS

Florisuga mellivora mellivora (Linnaeus). *Florisuga mellivora tobagensis* Ridgway. Jacobin. (Leotaud No. 72 as *Topaza mellivora* Linnaeus. Jacobine.) Length $4\frac{1}{2}$ to $4\frac{3}{4}$ inches. Bill 0.75 inch, straight, black. *Male*. The tail is pure white save for narrow black tips to the feathers; the terminal pair of upper tail-coverts are elongated and hide the white of the centre of the tail. There is a white half-collar on the back of the neck and the lower plumage is white. The rest of the plumage is glossy dark blue and metallic green. *Female*. The breast is conspicuously scalloped, the feathers with grey centres glossed with green and broad white margins. The upper parts, including most of the tail, are bronze-green.

I have no information about its nesting habits. The species is widely distributed in Trinidad though nowhere is it common. I have seen it in the Northern Range in several places, e.g. the Ortinola valley and near Cumaca road gap and also in the Arena forest, Tamana hill, etc. It prefers to perch high up on exposed, bare twigs of trees near open paths in forest at all levels. The male appears to take a delight in displaying his white tail and underparts as he performs aerial manoeuvres high up. The Tobago form is slightly larger, slightly more common and occurs in the same type of habitat.

*This article was contributed on the editors' request as a complement to the brief note on the same species which appears in Dr. Snow's article.