

VIRUSES GONE WILD

Review of:

C. Brooke Worth 1967. *A Naturalist in Trinidad*. Philadelphia: J.B. Lippincott 291 pp.
[38th in a series on "naturalist-in" books; see
www.ckstarr.net/reviews_of_naturalist.htm]

Brooke Worth (1908-1984) studied medicine in the USA, but not in order to practise in the ordinary way. Rather, his real interest was in birds, and he saw his medical degree as a way of going places to study birds. 25 years later, in 1960, he was sent to Trinidad for 4½ years. In addition to the book arising from this experience, he was the author of *Mosquito Safari* (1971, about southern Africa) and *Of Mosquitoes, Moths and Mice* (1972).

Worth was a wide-ranging naturalist, both geographically and taxonomically. He rebelled against the idea that an ornithologist should largely limit his view to the local fauna and took the whole world as his proper scope. And he struggled to learn about other groups of animals while far from major libraries and of course long before the internet.

A Naturalist in Trinidad has 24 chapters with two maps and 18 other illustrations by Don R. Eckleberry. It is a well-crafted book, with topics unfolding in a clear and meaningful way. About half of the chapters revolve around some particular animal or group of animals. The first is titled simply "Trinidad!", presumably a nod to Charles Kingsley (1874).

According to a recent estimate, about 320,000 kinds of viruses are known in the world, most of them hosted by animals. The Trinidad Regional Virus Laboratory (TRVL) in Port of Spain was established in 1951 with support from the Rockefeller Foundation and the governments of Britain and its Caribbean colonies. The scientific staff initially comprised ex-patriates, whom West Indians were trained to replace over time. Tikasingh (2000) has given us a more formal history of the lab.

The fact that Worth's main interest was birds led to occasional conflict with the head of the TRVL. Worth maintained that it was necessary to know the birds thoroughly in order to understand their transmission of viruses, while the head sometimes suspected that a proposed trapping initiative was more about birds than their viruses. Worth implies that this suspicion was well-founded in some cases.

In its early years the lab focused almost solely on viruses transmitted by arthropods, mostly mosquitoes and ticks. The most famous of these arboviruses causes yellow fever. This disease had appeared in Trinidad in 1954 after a 40-year absence, and it was not at all clear how this had happened. Had the virus been present all that time, or had it been introduced? Others were being discovered at the time, but it was not immediately known which were harmful to humans or livestock. As part of a team of specialists, Worth's main job was to find out where they existed in nature. His main approach was not to look for viruses directly but for specific antibodies in the blood of land vertebrates.

Believing that "A naturalist should live, eat and sleep among the animals he is

studying", Worth was disappointed to find that the TRVL had no field station. It has just been learned that Bush Bush, a broad, forested peninsula into the Nariva Swamp on the atlantic coast of the island (Tikasingh 2007), had plenty of arboviruses. This seemed like a very good site for a satellite facility. Worth was able to persuade the TRVL management to erect a small pre-fabricated house in Bush Bush to serve as a field laboratory and living quarters during the many days and nights he was pleased to spend there. Bush Bush is the book's key focus.

As a hard-core naturalist, it also pleased him to allow spiders and other creatures to take up residence in and on the building, and his assistants were under strict instructions not to clear out spider webs, "for their architects are my best friends." When a vacant nest box for birds was taken over by wasps -- probably *Agelais multipicta* -- his assistants suggested ways to get rid of them safely. "Could my workers never learn my attitude toward Bush Bush wildlife? Get rid of the wasps? I was delighted to have them."

Compilation of an inventory of 264 land-vertebrate and 155 blood-feeding arthropod species in the area served as a key preparation for the search for arboviruses. This high diversity in a relatively small area also persuaded the Forestry Division to declare the Bush Bush Wildlife Sanctuary in 1968 (Tikasingh 2007).

The search was a big operation in terms of vertebrates sampled and mosquito cultures kept. Huge numbers of birds were mist-netting, banded for later identification, and blood samples extracted, while mammals were live-trapped and similarly processed. In both groups, they got many repeaters, individuals trapped two or more times.

The red howler monkey, *Allouatta seniculus*, is a prominent feature in Bush Bush with an important in relation to yellow fever. The authorities were worried about its possible spread from the forest into populated areas and to humans and undertook a campaign to eradicate the *Aedes aegypti*. This mosquito transmits the yellow-fever virus in towns, but not in the forest, requiring a chain of events involving monkeys and mosquitos. *A. aegypti* also spreads dengue, another very serious disease.

One of the lab's side-trips was to Soldado Rock, an uninhabited, steep-sided islet off the southwest tip of Trinidad. There they found a huge quantity of ticks and a new bird virus. The trip was so fruitful that it became a regular TRVL project for a time.

The breadth of Worth's interests is seen in his side-projects and auxiliary observations in the course of his virus studies. As an example, he devised ways hoist mist nets up to near the canopy, where the first bird caught was a black-tailed tityra, *Tityra cayana*. This approach also caught other birds that did not come to understorey nets. Aside from widening the range of birds sampled, it provided data on the stratification of species. And he shows an appreciation of bats, even though they were not central to the TRVL mission.

This very human book has humorous and often vivid characterizations of TRVL scientific and support staffers. One of the former was Elisha S. Tikasingh. Despite a PhD in parasitology, "when he joined TRVL [in 1961], he didn't know a virus from a sea gull, so he was put to work on mosquitoes." Worth predicted a bright future for young

Tikasingsh, which anyone involved in epidemiology and/or natural history in Trinidad & Tobago over the last half-century will be happy to corroborate. Worth freely admits that his assistants sometimes tried to get out of hard work, but for the most part they are shown as dedicated and inventive.

The chapter on "Lists and List Makers" is a humorous discussion of obsessive list making -- of which Worth was definitely a sufferer, although he characterizes Thomas Aitken as far worse, a truly pathological case -- leading up to what it is all about: birders. He treats these as a peculiar category of preposterous, arguably mentally unbalanced human beings, even as he notes that he, himself, keeps a life list and can tell you at any moment how many species are on it. He concludes with a half-hearted argument -- something to do with an accidental contribution to serious ornithology -- that such list-making need not be utterly pointless.

Especially engaging is a passage on entomologists with their hand lenses, a "means of entering a world of beauty that largely escapes the rest of us." He notes that "A magnification of only five diameters is sufficient for a shattering introduction to the entomological world." I enthusiastically endorse this view, and if it were up to me every schoolchild in the country would be issued an inexpensive 10X lens to aid in discovering a whole new world.

Worth never make himself the hero of any story and is often the butt of the joke. Any marked success on his part is attributed to luck and fumbling through.

The book does have its shortcomings. Worth manifests a certain distaste for scientific names, regarding them as unpoetic. (He gets especially rhapsodic about standard English names for various hummingbirds.) As a result, the glossary at the end is of little use in associating vernacular and scientific names, although the index is somewhat better.

Accompanying this is a certain carelessness about species identification in his auxiliary observations. In *Bush Bush*, Worth made frequent visits to the latrine to observe a pholcid spider and the web-inhabiting bug *Arachnocoris* -- misspelled *Arachnicorus* -- which is uncommon and very little studied at that time. He noted that if the spiders were disturbed, "they would suddenly engage in a wild circular dance, vibrating and rotating so far that they became blurred. Upon ceasing this maneuver equally suddenly, they could be seen not to have changed their perches."

He set up a cage to observe the relationship between the two species, with advice from a specialist at the American Museum of Natural History (AMNH) in New York. This provided an apparently very fruitful little side-project to his main research, the core result of which was that the bugs are kleptoparasites that move about carefully in the webs so as not even to be noticed by the spiders. Despite urging to write a formal journal article of his results, he preferred just to set them down in this book chapter.

The two species were identified by specialists, but Worth does not give us the names. To judge by the descriptions, they were most likely *Coryssocnemis simla* (spider) and *Arachnocoris trinitatus* (bug) (Sewlal & Starr 2009), but the fact that a research scientist would drop such an interesting study during the final step is quite flabbergasting.

The chapter on "Bees" is a description of how Worth and his assistant tried to keep

a colony of social bees in an improvised hive for the purpose of extracting honey. It is a breathtakingly fatuous chapter. They had no clue what they were doing or even whether these were honey bees, even though the initial description makes it plain that they were stingless bees. They even put honey-bee comb frames into the hive, which of course the bees never utilized. Worth finally got them identified, but again he doesn't tell us what they were -- it sounds like *Trigona nigra*, which is utterly useless for honey production -- and I have to wonder why he included this tale of bumbling.

Trinidad, at 4800 km², is among the biotically best studied areas in the neotropics for its size. Worth was able to interact with some of the pioneering Trinidad-based biologists of his time, such as Thomas H.G. Aitken, Jocelyn Crane, Wilbur G. Downs, Arthur Greenhall and Elisha S. Tikasingh. All except the latter were expatriates, and Worth was there at the start of the transition toward local scientific predominance.

References

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