

STUDIES ON THE FAUNA OF SURINAME  
AND OTHER GUYANAS: No. 1.

THE ZOOLOGICAL EXPLORATION OF SURINAME

by

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For a long time, investigation of the fauna of Suriname encountered great difficulties. These included: great abundance of species; inaccessibility of the territory concerned; lack of zoologists on the spot, and little interest in Neotropical material on the part of Dutch biologists. Moreover, the practice of this branch of science has depended on the initiative of private individuals, the result being that no definite programme has been followed. Owing to these circumstances investigation of the zoology of Suriname has lagged far behind investigation of its botany and geology.

FAUNISTIC EXPLORATION

Strangely enough, of all the branches of natural science, the zoology of the country was the first to receive attention.

In 1700 MARIA SYBILLA MERIAN initiated the entomological exploration of Suriname, by virtue of her work there, to which her beautiful picture book bears witness. Up to 1850 much of the material collected — especially entomological material — was used in Europe in the publication of fine illustrated books on the strange creatures of luxuriant tropical nature (CRAMER 1779, STOLL 1788, SCHELLER 1829). In a review of the fauna of Demerara BANCROFT (1769) gives much local information, and FERMIN (1775) characterizes the animals of Suriname for the first time in quite an extensive essay. Later on, COLLIN (1822) listed in his catalogue many data known at that time on the fauna of this country. Then came a period of more scientific collecting, begun by DIEPERINCK round about 1820 and energetically continued, in particular by KAPPLER,

1840–1880. The latter gives a résumé of his experiences, and of his observations of the animal kingdom, in his well-known book *Surinam* (1887). Up till now this book has constituted the best survey of the zoology of Suriname; but it is also practically the only one in existence. MÖSCHLER's systematic studies on the Lepidoptera of Suriname (1876–1883) are of quite a different calibre, though on a higher scientific level.

The next period, from 1880 to 1916, was characterized by the assembly of zoological material during various expeditions. Here, amateurism and expert work alternate to a disturbing extent, the consequence being that the results fail to reach the standard required. A good, authoritative work is that of UYTENBOOGAART (1902) on the Coleoptera he collected on his journey to the Suriname gold fields. The fragmentary statements in the *Encyclopaedie van Nederlandsch West-Indië* (1914) are less happy. The comment made in this publication by H. J. VETH, who dealt, inter alia, with the insects of Suriname, is indicative: This, perhaps, is the place in which to point out how amazingly little we know about the Insecta of Suriname. Except as regards the Lepidoptera and Coleoptera, about which we know at any rate a little more, we still have entirely virgin territory before us here (p. 384).

Nor is the situation any better as regards the other classes of animals. One ray of light in the otherwise cheerless picture is the book by the brothers PENARD (1908) on *De Vogels van Guyana* (The Birds of Guyana). However, this well-known work does not exactly specify the birds of Suriname, although they form its basis, for it treats the three Guyanas as one unit. Nowadays our demands are more exacting, and moreover there is much that is out of date in the determinations of the PENARDS. A short time ago, HAVERSCHMIDT (1955) produced a modern treatment of the subject in his *List of the Birds of Surinam*.

Only scattered information is available concerning the other higher animals such as Mammalia, Reptilia, Amphibia and Pisces. KAPPLER, TATE (1939) and SANDERSON (1949) supply details of the Mammalia, and VAN LIDTH DE JEUDE (1904) has given an initial list of Reptilia and Amphibia, while the researches of BLEEKER (1862–1873), VAN DER STIGCHEL (1946), BOESEMAN (1948–1956)

and HOEDEMAN (1952) throw some light on the Pisces of Suriname. No recent compilation exists in respect of any of the classes named.

In past years, only fragmentary treatment has been accorded to the lower classes of animals, apart from the insects. On the basis of the zoological material collected by H. TEN KATE during his journey to Suriname in 1885-86, VAN HASSELT published the first contribution to our knowledge of the spiders of the country in 1888, mentioning sixteen species. Two monographs have appeared on the Mollusca, viz. one by SCHEPMAN (1887) on the marine forms from the ridges, and one by VERNHOUT (1914) on the land and fresh-water species. Some months ago PAIN dealt with Melaniidae of Suriname and British Guyana. In recent years HOLTHUIS (1948) has published some articles on the shrimps, while JEEKEL (1950) has contributed notes on the centipedes and millipedes. A number of species of water mite have been described by WALTER (1919), VIETS (1939), and BESSELING (1949).

The period from 1916 down to the present day has been characterized by applied zoological research, especially in entomology, and by further collecting activity both in the interior and in the cultivated part of Suriname. In the sphere of agricultural entomology, important contributions have been made by REYNE (1921, 1927) on the subject of thrips; by BÜNZLI (1935) on Coccidae and ants, by STAHEL & GEIJSKES (1939, 1941) on leafcutting-ants; by GEIJSKES (1940) on stored-product insects; and by VAN DINTHER (1955, 1956) on a mole cricket, aphids of citrus, some noxious species of Lepidoptera, insects of the coconutpalm and of soybean, and Coleoptera injurious to bananas and cacao. In 1951 GEIJSKES also produced a historical survey of research in the spheres of agricultural and general entomology in Suriname.

As regards medical entomology the work of BONNE & BONNEWEPSTER (1925), *Mosquitoes of Surinam*, is of pioneering importance. Unfortunately the development of this branch of science during and, more particularly, after World War II has rendered the book obsolete, and its revision is therefore to be desired. An up-to-date view of the subject has been provided by VAN DER KUYP (1950) in respect of the anophelines. VAN THIEL (1930), and later VAN THIEL & VAN OMMEREN (1941), have pointed out the medical

significance of the patata mite in connection with leishmaniosis americana.

On the basis of material collected in Suriname by Dr. C. BONNE, ORTLEPP (1914) gives a list of 38 species of parasitic worm occurring in various mammals, a lizard, some toads and some species of fish. FRICKERS (1939) mentions over 40 species of worm found in domestic animals; as regards those infesting man in Suriname, FLU (1911), BONNE (1920), VAN DER KUYP (1950), and FROS (1954) have reported on the Filaria worms, and LAMPE (1925) on *Schistosoma mansoni*, but a survey of all species of worm parasitic on man has yet to be made.

Of the Protista only parasitic forms are known, e.g. *Amoeba*, *Plasmodium*, *Leishmania*, etc. in man (FLU 1912, et al.), *Babesia*, *Anaplasma* and *Trypanosoma* in the blood of bovine cattle (FRICKERS 1939), but no information whatever is yet available regarding the non-parasitic and free-living species.

#### THE COLLECTING EXPEDITIONS

It is understandable that the earliest collections should have been formed in the plantations in the coastal region and the savanna zone. SYBILLA MERIAN worked for quite a time on La Providence plantation, on the River Suriname near Phedra. KAPPLER wandered past many military posts, which were generally situated in the savanna, but his main field of activity lay near Albina, beside the Maroni, where he lived for twenty years.

The remote interior did not receive attention until after 1860. The first information on the composition of the fauna of those regions was obtained, in particular, by the topographical expeditions sent out by the "Koninklijk Nederlandsch Aardrijkskundig Genootschap" (Royal Netherlands Geographical Society) in the years 1903–1911. Owing to the absence of qualified specialists on these expeditions, the zoological results greatly disappointed expectations.

Of the expeditions after these which played an important part in collecting animals, mention may be made of the Wilhelmina Mountains expedition in 1926 (STAHEL and FERNANDES), and the Southern Border expeditions in 1935–38 (ROMBOUTS) and 1938–42 (AHLBRINCK, GEIJSKES and SCHMIDT). An important collection

was assembled by SANDERSON in 1938 for the British Museum. References must also be made to GEIJSKES's Coppename Hevea expedition of 1943-44, the Natural Science expedition to Suriname in 1948-49 (GEIJSKES and CREUTZBERG), and the Medical and Scientific expedition to the southern border of Suriname in 1952 (GEIJSKES and BRUYNING). A journey to Suriname by D. PIET in 1951-52 also yielded good results in the sphere of entomology.

Much of the material collected is to be found in the Netherlands, distributed between the "Rijksmuseum van Natuurlijke Historie", Leiden, and the "Zoölogisch Museum", Amsterdam. Some of it is in the collections of the "Stichting Surinaams Museum", Paramaribo. Of this recently assembled material only a small part has been studied by specialists. The bulk of the Suriname zoological material has still to be worked upon.

#### THE SIGNIFICANCE OF ZOOLOGICAL EXPLORATION TO SURINAME

Accordingly, the zoological exploration of Suriname has hitherto consisted largely in the collection of material, and only to a small extent in processing of the data obtained. Since 1900 special attention has been given to applied zoological research, agricultural and medical entomology having been studied on a modest scale. General scientific investigation of the fauna of the country has been left to chance individuals outside Suriname who have happened to be interested in the subject. As a result of this very little has been achieved.

It will be clear even to the uninitiated that this insufficiency of knowledge has greatly handicapped applied work in Suriname. The specialist taxonomist will describe each new species with pleasure; but the zoologist or ecologist working for practical ends will regard every novelty as an obstacle in his path. Practical zoology must be based on general scientific and systematic research, and as long as this is not the case, work will be greatly impeded.

The official bodies in Suriname which have an interest in the general zoological exploration of the country are:

(1) The Department of Agriculture, Livestock Husbandry and Fisheries. — Agricultural entomology is faced with many systematic

difficulties; species determinations are of primary importance in the investigations and control measures. The Livestock Husbandry Division is interested in knowledge of bloodsucking insects and other creatures, in connection with transmission of diseases of cattle. For the Fisheries Division, knowledge of the edible fishes of Suriname is indispensable. The gaps in our zoological knowledge also make their presence severely felt in hydrobiological studies.

(2) The Department of Public Health has to have at its disposal exact systematic knowledge of those species of animals which occur as parasites on man or are dangerous in other ways, such as parasitic worms; insects and mites which suck the blood of human beings; snakes and other reptiles; and mammals and birds as regards their parasites.

(3) The Suriname Forest Service is concerned with agents which damage various kinds of wood, and with species of animals that play a harmful or regulating role in the forests. Nothing has yet been done in this field. Research on termites and ants, as well as on wood-boring beetles, still has to begin. Observations with regard to the birds and mammals in the forests, in connection with the distribution of seeds, etc., are also highly desirable.

(4) The Geological and Mining Service of Suriname has an interest in the Mollusca (sub-fossils and fossils), knowledge of which may support investigations regarding the structure and formation of the coastal plains. Furthermore, investigation of the microfossils (sponge spicules, Foraminifera, etc.) will help considerably in determining former transgressions and regressions, and will therefore influence the differentiation of marine from continental elements. In connection with this, investigation of the forms of animal life found in the sea off Suriname will also be of importance.

(5) The Suriname educational system suffers from a shortage of specimens of the country's own animal life. No book exists on the mammals, reptiles, amphibia or fishes of Suriname. Nor have the educational authorities access to what has become known regarding the insects and the lower animals. It is high time the situation was remedied, to enable many errors in this sphere to be eliminated from Suriname schools.

(6) The Commission for the Protection of Nature has so far only

been able to put forward and publicize a proposal for the introduction of a game law. In drawing up a list of species of animals which require protection, lack of data has rendered it necessary to propose that, for the time being, *all* the higher animals of the country should be protected. Better knowledge of the fauna is likewise necessary before nature reserves for the protection of menaced animal species can be designated.

#### GENERAL SIGNIFICANCE TO SCIENCE

Interest in the Neotropical area is also increasing more and more among biologists. The Andes, the Amazon and other parts of Brazil have been an object of study to many savants for a long time past. It can hardly be said that these regions have already been sufficiently explored; but they are undeniably receiving a great deal of attention. The Guyanas, however, certainly belong to the poorly studied regions. The inaccessibility of the territory is partly to blame for this. Another adverse factor is the circumstance that few scientists have visited the countries for any length of time, and zoologists form only a small minority even of these.

R. H. SCHOMBURGK's investigations in British Guyana, more than a century ago, are well known. Unfortunately the work done then has never been continued. Admittedly, some British investigators (HINGSTON) and, more particularly, Americans (EIGENMANN, BEEBE) have been active there, but, however many valuable contributions to the zoological knowledge of this region may have resulted from these investigations, they merely form so many proofs of the inadequacy of our knowledge of the subject. Here again, a clear-cut, planned research objective is still lacking.

In French Guyana work has been done in the sphere of medical entomology, while some material in the "Muséum d'Histoire Naturelle", Paris, is being examined and the results of the examination published. The fishes are being dealt with by PUYO (1949).

The interest in Suriname which existed in the eighteenth and nineteenth centuries has sunk to a minimum in the twentieth century, partly owing to the economic decline of the country. Since 1940, however, American circles have been paying a certain amount of attention to this forgotten land.

As regards the general scientific importance of the zoological inventarization of Suriname, it should be pointed out that this region falls within the great system embracing South America, Central America and the Antilles, as regards problems of a zoogeographic nature. It has been found that a number of classes of animals can be divided into (a) elements restricted to the Amazon basin, and (b) elements distributed throughout the mountain country, in a ring round this basin, which do not occur in the basin itself. The investigations carried out in the interior of Suriname have clearly shown that most of the animals of the lowland forest belong to the Amazon fauna, while various mountain forms may be classified among the Andes type (GEIJSKES 1956). Better knowledge of the Suriname mountain fauna will result in many more such interesting discoveries.

In the coastal area of Suriname various animal forms occur which have nothing to do with the fauna of the interior. These elements enjoy a wide distribution along the coasts of the northern part of South America, and must be regarded as intruders in the old area. But how far inland do they intrude, and what determines the limits of their intrusion?

These zoogeographical data are of great importance both to applied science and to general scientific research. After all, in controlling or protecting certain species of animal it is necessary to know the exact situation, and the extent to which it is possible to avoid difficulties.

Finally, attention should be drawn to the possibility of ecological research when the fauna are better known. In this connection, I have in mind the part played by the fauna in the economy of the Suriname forest, and also the distribution of Pisces in the various waters. What lives in the closed biocoenosis on the mud banks of the coast? What fauna characterizes the Suriname swamps? What is the zoological composition in the lower reaches of the rivers, at the falls, and in the upper reaches of the rivers? Are the savannas characterized by an endemic fauna, or must their fauna be looked upon as a derivative of the surrounding forest? This last point should be studied in connection, *inter alia*, with the problem of the mode of origin of these areas in Suriname.



The above has shown that the faunistics of Suriname at present constitute an element of the natural sciences which is very difficult to handle, with the result that far too little use can be made of it, either nationally or internationally.

There is therefore reason for rejoicing that publication of these "*Studies of the Fauna of Suriname and other Guyanas*" has become possible. By concentration of data they will supply a much-felt want, and will help to give a clearer picture, in a more easily accessible form, of the results of the zoological exploration of Suriname, and if possible of the other Guyanas as well, for the benefit of everyone who wishes to make use of them.

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