

ZOOLOGICAL RESULTS OF THE ABOR EXPEDITION, 1911-1912.

INTRODUCTION.

In accordance with a resolution passed at the Conference on Museums and Archæology held at Simla in July, 1911, it was arranged by the Trustees in consultation with the Military and Education Departments of the Government of India that I should accompany the Abor Expeditionary Force as Zoologist and Anthropologist, and that Mr. R. Hodgart, Zoological Collector in the Indian Museum, should go with me as assistant.

The present volume is devoted to the zoological results and parts will be issued from time to time as reports become available for publication. The issue of the usual annual volume of the "Records" will continue as heretofore.

In addition to results obtained with the Abor Expeditionary Force, in several groups the determinations of animals obtained by Mr. F. H. Gravely in November and December, 1911, between Moulmein and the Siamese frontier will be included. The fauna of this area, at least of the Thaungyin Valley, is not very dissimilar from that of the Abor country, and notice of specimens from this area will be of interest from a comparative point of view.

Mr. Hodgart and I left Calcutta on November 13th and arrived back on April 3rd after having spent about four months in the Abor country.

On the outward journey we were detained for about a fortnight before we could proceed to Kobo, the base camp of the expedition, and this period was spent in making observations on the fauna at Dibrugarh on the left bank of the Brahmaputra and at Sadiya which lies on the right bank at the foot of the Mishmi country.

We reached Kobo on November 29th and remained until December 13th; on the 14th we left by boat-convoy up the Dihang River and arrived at Pasighat and Janakmukh on the evening of the 16th, and leaving the latter camp on the 19th we marched to Renging and Rotung, arriving on December 21st.

I was unfortunate in being unable to join the party which left Yembung, the head-quarter camp, on December 27th to explore the course of the Dihang river and survey the country to the north: shortage of transport compelled Major-General Bower to refuse my application. My main object when I joined the expedition was to explore the practically unknown Himalayan fauna of the N.-E. Frontier, but it now became

evident that this idea would have to be abandoned. As events turned out this was not so disadvantageous as was feared, for the fauna of the foot-hills yielded material of very considerable interest and in investigating this region it was not necessary to make any drastic reduction in the apparatus required to carry on the work. But the country visited must be regarded purely as the foot-hill region of the north-east Himalayas and this fact must not be lost sight of in any comparisons which may be drawn between the Abor fauna and that of the ranges further to the west.

We remained at Rotung until January 12th, when we proceeded to the head-quarter camp at Yembung, and a week later I received permission to join a small party with an Indian surveyor under Capt. A. L. M. Molesworth which was going up the right bank of the Dihang to explore the courses of the Siyom and Shimang rivers, two large tributaries of the Dihang. I left with Capt. Molesworth on January 23rd. We reached Parong, a village two marches below Riga, and Damda which is some ten miles up the Siyom river, and returned to Yembung, sooner than was anticipated, on February 3rd. Triangulation did not form part of the survey work on this occasion; there were consequently no halts of any considerable length and the greater part of the time was occupied in hard marching which afforded but little facility for zoological work. Subsequently I proceeded to the Komsing camp, close to the Abor village of that name, and remained there until March 3rd, but the work accomplished during this period was almost entirely anthropological.

On my return to Yembung I proceeded as soon as possible to Rotung, where I purposed staying a few days to make further observations on the zoology of the district. But Capt. Sir George Duff Dunbar, who was then in command of Rotung post, suggested that I should make a short expedition to the west beyond Kalek and the Sireng valley towards Misshing, offering to provide an escort and Abor cooly transport for the purpose. I accepted this offer gladly, and in company with Mr. J. Coggin Brown of the Geological Survey and Dr. Falkiner of the Assam Valley Light Horse, who was then attached to the Lakhimpore Military Police, I left Rotung on March 15th, marching two days towards the west, halting the third day and returning on the evening of the 19th. This expedition gave me an opportunity of visiting fresh country with high tree-jungle of a type not elsewhere seen, a change which was of course accompanied by a corresponding change in the fauna. My thanks are due to Sir George Dunbar for suggesting this expedition and for making every arrangement necessary for its success.

On the morning of March 20th we left Rotung and marched beyond Renging to the camp of the 32nd Pioneers in the Sirpo valley and after a day's halt proceeded to Pasighat, from which place we reached Balek, where three days were spent in anthropological work. Returning to Pasighat we proceeded on March 27th by boat-convoy to Kobo, and leaving there a few days later arrived in Calcutta on the evening of April 3rd.

The Abor country lies in the N. E. corner of the Indian Empire and is bounded on the east by Mishmi country, on the north by Tibet,

on the west by the land inhabited by the Miris and on the south by the Brahmaputra River. Plate I, which is reproduced by permission from the maps made during the expedition by officers of the Survey of India under Capt. O. H. B. Trenchard, R.E., shows the routes which I traversed and the principal places at which collections were made.

In a north and south direction the Abor country extends for about 80 miles.¹ Between the base camp at Kobo and Janakmukh and Balek it consists of an alluvial plain situated at a height of 400 to 600 feet above sea-level and clad with dense jungle interspersed with open patches of long grass or *chapris*. In some places the jungle has at one time or another been cleared for cultivation, but the older clearings are for the most part so thickly grown with scrub and creepers as to be almost impenetrable. To the north of this the country is a maze of hills, often precipitous, and intersected by the boulder-strewn courses of the numberless small streams that drain into the Dihang river. All the hills were originally clothed from foot to summit with tree-jungle, but frequently, more particularly in the vicinity of the Abor villages, large tracts of country have been cleared. Many such areas have, after a period of years, been discarded for cultivation purposes and soon develop thick scrub-jungle.

The majority of the specimens obtained were found at comparatively low altitudes between 400 and 2,500 ft., but some were taken at greater heights up to about 5,000 ft. and part of a small collection of insects, made for me by Mr. J. Coggin Brown of the Geological Survey, was obtained on Geku hill at a height of about 10,000 ft. Papu, the highest of the foot-hills proper, reaches an altitude of 6,390 ft.

As regards invertebrates, the best results were obtained by searching under bark and in rotten wood and large collections were made by this means alone. In particular some dead and partially decayed jack-fruit trees, which were being cut by the 32nd Sikh Pioneers in the vicinity of Rotung, afforded admirable material; many of the branches were hollow and bored and when split open were found to be literally filled with a varied assortment of Carabidae, Staphylinidae, Passalidae, Endomychidae, Heteromera, Rhynchophora, Dermaptera and Blattoidea along with representatives of many other groups. Considerable collections were also made under stones and numerous interesting species were found in this situation.

In the Abor country the cold weather season is also the driest season of the year and numbers of invertebrates, to which an abundance of moisture is a necessity, take refuge during this period in plantain trees, living behind the great ensheathing leaf-stems. Water is invariably found in the leaf-base and the atmosphere in the almost completely closed chamber behind the leaf-stems is probably always at or near saturation point. A considerable amount of rain fell during February and March, and in the latter month it was noticed that the numbers of animals found in such situations had greatly diminished.

¹ Only the southern portion of the Abor country is shown on the map (Pl. I.); the great ranges further to the north were not visited.

Small Dytiscidae, Odonata larvae and Oligochaete worms were found in the tops of plantains and screw-pines (*Pandanus*), living in a collection of water at the leaf-base at from 20 to 40 ft. above the surface of the ground.

No lakes or pools of standing water were met with in the country and practically all the aquatic animals obtained were taken in small streams and rivers draining into the Dihang or its larger tributaries: in the Dihang itself, which in the rains appears to rise in some places at least sixty feet above its winter level, practically nothing could be found. The smaller rivers and streams of the hills teem with the larvae of Neuroptera and Odonata and in the warm weather the perfect insects must occur in very great numbers. Brachyurous Crustacea were not uncommon, but Macrura appeared to be represented only by a single species of *Palaemon*. Fish were plentiful and some, along with tadpoles belonging to the families Ranidae and Pelobatidae, show interesting adaptations to life in hill-streams subject to sudden spate.

The different groups of animals are unfortunately very unevenly represented in the collection, but this was to a large extent unavoidable. The cold weather season is not the best time of year for zoological work and the poverty of the collection in several respects, notably in some sections of the Insecta, must be attributed to this fact. Other groups, again, should have received far more attention than I was able to give them, for only by the devotion of a specialist's whole time to the subject could satisfactory results have been obtained among the birds and mammals.

My activities and opportunities for work were, as was only to be expected, somewhat limited by the restrictions necessary in the case of a military expedition carried out in a hostile country, but it was only in a few instances that these restrictions were severely felt. Work with an escort must of necessity have some drawbacks, though in many cases, more especially with Gurkhas, the escort was keenly interested and showed itself adept in the capture of the more elusive species.

To express my gratitude for all the help I received in the course of the expedition is a difficult task. I have in the first place to thank Major-General Bower, C.B., General Officer commanding the Force, for the interest which he took in my work and for the facilities extended to me.

To the 32nd Sikh Pioneers I am under very great obligation for the large collections of Reptilia and other animals which they made on my behalf. During the winter season most of the reptiles were in hiding beneath the ground or in roots of trees, and in these situations they were found by the Pioneers when cutting roads along the hill-sides. The extent of the help they gave me may be judged from the fact that while snakes are now represented by twenty-six species, three hitherto unknown and one belonging to an undescribed genus, my own individual efforts only resulted in the acquisition of three common forms. Through the instrumentality of the British officers of the regiment and in particular of Capt. the Hon. M. de Courcy each non-commissioned officer on works was provided with a large section of bamboo fitted with a plug

and every day a valuable collection of snakes, lizards, frogs, centipedes, scorpions, etc., was obtained.

Numerous specimens were also contributed by Col. (now Brigadier-General) D. C. F. Macintyre, Capt. A. L. M. Molesworth, by Capt. J. S. O'Neill, Capt. F. H. Stewart and Capt. R. S. Kennedy of the Indian Medical Service, by Capt. H. W. Price and Mr. G. F. T. Oakes. We are indebted to Major Sweet, Capt. B. R. Nicholl, Capt. J. Masters and Mr. I. Burn Murdoch for the loan of various mammals and to Dr. J. Falkner for the loan of a collection of birds.

Opportunity will I hope be found of making fuller individual acknowledgments in the course of publication of the different reports, though it will still be impossible for me to express my thanks in an adequate manner for all the kindness and hospitality I received from officers of different services attached to the expedition.

I was fortunate in having Mr. R. Hodgart with me as my assistant. Throughout the period during which we were attached to the expedition his energy was unremitting and he spared no efforts to render the work a success.

STANLEY KEMP,

June 1st, 1912.

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