JOHN SAMUEL BUDGETT

When John Samuel Budgett joined Trinity College in the autumn of 1894 he brought with him letters of introduction from Mr S. H. Reynolds of University College, Bristol, which at once introduced him to the circle of Zoologists at Cambridge. These letters dwelt on two matters, both of them eminently characteristic of our friend. One was his great modesty, a modesty which at times amounted almost to wholly unnecessary self-depreciation, the other was his quite extraordinary skill in making anatomical preparations.

J. S. Budgett was born at Redlands House, Bristol, on 16th June, 1872. Two years later his father moved to Stoke House, Stoke Bishop, and here the greater part of his life was spent. His first school was a kindergarten, from which he entered Clifton College, but he had to leave there when he was about fourteen years old, as he was suffering from a severe form of headache, the result of an accident. He continued his studies, however, with private tutors, and finally joined University College, Bristol.

As a boy he lived with his parents in the charming old stone house with stately carved portal in the pretty village of Stoke Bishop, at that time much more in the country than now, when the houses of Clifton threaten to draw near it. Here in the spacious grounds he was allowed to build aviaries and adapt out-
houses for the shelter of his numerous pets. Here also he acquired some of his skill as a dissector, and a carpenter’s shop in which the children had learned carpentry was gradually turned into a Laboratory and a Museum in which stuffed birds, skeletons of a cow, of a deer, and of the children’s Shetland pony, and many wonderfully minute dissections were displayed. Budgett as a boy was fully abreast of modern methods, and used to make many preparations with natural surroundings, such as a stuffed swallow with its nest under a bit of tiled roof. He was a frequent visitor at the Clifton Zoological Gardens, and there he learned much. He always enquired attentively after any sick animals, not, it has been suggested, with a view to prolonging their life. In the summer he used often to go for long walks at 3 a.m. to enjoy the sunrise and to watch the awakening bird and beast life.

Mr W. H. Budgett, our friend’s father, was a keen microscopist and a member of the Bristol Microscopical Society. He was also on the Council of the Bristol Museum, and was keenly interested in many branches of Natural History, a keenness he was eager his children should share.

Whilst Budgett was a boy his father’s house was visited by many men of science. Amongst these, Professor W. K. Parker, who for twenty-three years in succession spent a fortnight at Stoke House, undoubtedly exercised a strong influence on the boy. At this period the Professor was advanced in life, and to quote his son’s admirable biography of him, “His habits became more retired, and almost his only outing was an annual visit to his friend Mr W. H. Budgett, at Stoke House, Bristol”; still, to the last, Professor Parker was brimming over with enthusiasm, and he can hardly have failed to fascinate the young zoologist. Professor Parker was remarkable for his skill in the preparation of delicate skeletons, such as those of tadpoles and of the minutest birds, and I have often thought that Budgett’s extreme cleverness in making all sorts of anatomical preparations owed

---

Home Life

much to the example of his elderly friend. Another visitor, the Rev. Dr Dallinger, well known for his great gift of exposition, must often have stirred the interest of the keen and eager lad.

After leaving school he still continued to study Zoology, and received much help from the Principal of University College, Bristol, Dr Lloyd Morgan, and from Mr (now Professor) S. H. Reynolds, but he was in a great measure self-taught. His knowledge of bird-life, his acquaintance with the methods of mounting objects, and his skill in keeping animals in captivity healthy, could not have been acquired in the Lecture-room. It must have been about this time that he began to design a new microtome which he laid aside for some years. During the last few months of his life, after his return from the Niger, he again took it up and had hopes that it would prove an effective instrument. He also devised a scheme of his own for making models of structures by cutting them into sections, drawing the sections on cardboard, cutting the drawings out, and sticking them together, one behind the other, in series.

His thorough knowledge of Natural History made him many friends on his arrival in the University, both among the senior and the junior members, and he was elected to the Cambridge University Natural Science Club in his first year, a somewhat unusual honour.

In 1896, at the end of his second year at Cambridge, he took Part I of the Natural Sciences Tripos. His University career was interrupted in his third year by a voyage to South America.

In 1890, when on the Page Expedition to the Pilcomayo, Mr Graham Kerr, now Professor of Natural History at Glasgow, had from a soldier the account of a fish dug up from the mud and eaten, and from the description given he suspected it to be Lepidosiren. This was confirmed in 1894 by the German Naturalist Bohls who first obtained this fish from the Gran Chaco. The expedition came to an untimely end, the leaders of it either died

---

According to an article in Die Thierwelt, vi. Jahrg. 16 Sept. 1896, the Gran Chaco habitat of Lepidosiren was first proved by Terner, "vort 3 bis 4 Jahren."
4

J. S. Budgett

or deserted. The river disappeared and left their small steamer stranded in a dried-up bed. Mr Graham Kerr, as he then was, with the remnant of the expedition succeeded in reaching the coast and, returning to England, he joined Christ’s College in 1892 and took his degree four years later. But during the time he spent as a student at Cambridge the haunt of the *Lepidosiren* was ever before him. In the autumn of 1896 he was able to start for the Gran Chaco of Paraguay, and he took Budgett with him.

Budgett was always a delightful travelling companion, considerate, thoughtful of others, very clever with his fingers, resourceful, and a good sportsman.

His knowledge of the fauna, particularly of the bird-fauna, was considerable, and he made a special study of the Anuran Amphibia of the swamps of Central South America, a study which resulted in his “Notes on the Batrachians of the Paraguayan Chaco.” He kept very complete diaries. These were never meant for publication, and were written in every conceivable circumstance of discomfort, but I have reproduced passages from them practically as they stand, with only a very few verbal alterations where the sense seemed obscure. Several passages from that of his South American journey are worth quoting. They all show an eye alert for natural phenomena of every kind. On the 7th September, 1896, steaming up the great La Plata river on their way to Asuncion, he writes:

“Sky overcast, lightning and thunder at daybreak. Steaming through the delta all day, mostly hugging the western bank where the edge of the pampas formed a cliff about 60 ft. high. The channel by which we went up was as a rule about one mile in width, though the true eastern bank of the river was at least 50 miles distant. Perfectly flat shifting islands filled up the whole of the river at this part: they were covered with low but rich vegetation, and teemed with all kinds of wild fowl. We passed two settlements, San Nicolas and Villa Constitucion; at the latter place the manager had a very large English house, Lucern seemed to be the chief product here.

*Birds:* the most abundant *Milvago chimango*, perching in trees and on the ground. *Phalacrocorax brasilianus*, differing only from the British species in its yellow beak. *Euxenura maguari*, flying with legs straight out behind,
The La Plata

wings dipping only slightly below the horizontal; six beats and then floating on the air for some distance, and then six beats again and so on. *Aechmophorus major*, somewhat larger than the British great crested grebe, mostly of a chestnut colour, with white secondaries. *Ardea cocoi*, tall herons, standing with neck outstretched, but at angle of $15^\circ$ from the vertical. *Dendrocygna fulva* (the tree-duck), one flock; *Mareca sibilatrix* (a widgeon), one flock. *Polyborus tharus* (the Carancho or Caracara), two perching on distant tree.

Ran aground 5.30 p.m., trying to get to pier at Rosario, water very low. 100 tons of cargo to go to Rosario, hope she will then float.”

Again:

“September 9th, 1896. Dull morning and close. 1 p.m. reached La Paz. The river is rather uninteresting to-day. About 3 p.m. regular Pampero thunder-storm, with violent wind from south-west, and rain in torrents. At first there was a black bank of cloud lying near the horizon, from which flashes of lightning passed to the earth, five or six in rapid succession. These series of flashes came at almost regular intervals. Other flashes extending almost right across the sky came more irregularly. Then the sky immediately above the horizon became brilliant yellow and streaked with clouds of sand; suddenly the storm burst upon us, lashing up the water and driving off the tops of the waves in clouds of spray. Then down came the rain in heavy torrents.”

Near Las Palmas he notes that:

“The ground was bright with patches of red, blue, and pink verbena and innumerable other flowers. The most striking thing was the noise the frogs made; a regular chorus of little bells1 was continually going on, while here and there we heard a noise like two cats mewing2; we did not, however, discover what species made these. Many very brightly coloured birds were seen, among which were the Carancho, some Picui Doves, and a pretty Snipe. I heard for the first time the oft-repeated call of the Martineta. A rabbit, or Brazilian hare more likely, bolted from beneath my feet. I noticed a nest of the Termite and also of the Oven bird, which it somewhat resembles.”

Budget had a keen eye for beauty, and in unadorned language was often able to reproduce the scene to those who perforce must remain at home. On 27th September, 1896, at Concepcion, he writes:

“‘Laguna’ was covered around the edges with several beautiful kinds of

---

1 Probably *Bufo granulosus*, Spix.  
2 Probably *Paludicola fuscomaculata*, Steind.
6

J. S. Budgett

Camaloté\(^1\) in fine bloom. The foliage and flowers were most luxuriant; beautifully plumaged birds flew here and there, gorgeous butterflies, and flimsy, delicate dragon-flies made the scene charming. A shower of rain refreshed the flowers and caused the gaily coloured Kingfishers to renew their angling efforts. We brought back our little bottle of spoil and did our first piece of scientific investigation with the microscope in South America. Soon crowds of natives shut the light out from our windows, among whom were some Lengua Indians. These are always to be seen wandering about the town or paddling across to the Chaco bank opposite."

And three days later:

"Started in the canoe about 7.30 a.m., intending to paddle up stream two leagues and down the Chaco side of the island which lies opposite Concepcion. We found, however, that the stream and wind were too much for us, so turned back and floated some distance down stream. At a rather likely place for snipe we went ashore with a few No. 7, and after walking inwards until we came to a lagoon, we saw on a little island a flock of about fifty Whistling Ducks. After a very cautious stalk I got within forty or fifty yards of them, trying if possible to get near enough to shoot a brace through the head, before they rose, but it was not to be. I was discovered too soon and up rose the flock, after which I sent two or three ineffectual shots. On the same little bit of water we bagged four nice Sand-snipe with the remaining cartridges; and then of course we had around us numbers of Snipe, Jaçanas, a large flock of Ibises and other birds. How could they know we had shot our last for that morning?"

His interest in the Frogs is shown by his diary for 13th October, 1896:

"Started out for walk at 6 a.m. with gun. Shot several birds and found some queer insects. Came back at 10 a.m. On the way passed two or three hundred vultures sitting on the palings of a slaughter house. Read newspapers till breakfast. After breakfast skinned three birds. Then went down to pool by river and discovered a beautiful little green frog\(^2\) on the Camaloté. On almost every piece of Camaloté there was one. The males keeping constantly calling to one another. On the way back I found by much searching two new species of frogs. The Mosquitoes have been worse to-day than ever before.

\(^1\) Budgett writes this word Camelota. Mr S. A. Skan has kindly suggested to me that it is probably the Camaleote mentioned by Hieronymus in his *Plantaes Diaphoricas Argentinae* and by Bettfreund in his *Flora Argentina* as the native name for the *Eichhornia azurea*, Keenth.

\(^2\) *Pseudis limellum*, Cope.
The Frogs of the Chaco

Frogs. No. 1 and No. 2 were male and female of a frog* which seems to be more common than any at Concepcion. The male has a characteristic call, beginning on a rather low note, and ending on a higher one. It is very common and at sunset is everywhere in one's path. Its back is striped with parallel ridges of the skin. It is marked with black blotches on a greenish grey ground; the most characteristic mark is the triangular black patch between the eyes. The external ear is a very conspicuous tympanum.

No. 3 is a male. It makes a call similar to No. 1, but lower and softer. If it is chased, contrary to the usual rule, it still continues to call loudly, and thus does not easily escape the collector. This frog has a clumsy appearance, and its general shape is toad-like. The markings are distinct, chiefly black and green and a little yellow; the eyes are prominent. Very difficult to find in the grass, but with each croak it reveals itself by causing the yellow skin of the chin to become visible at the sides of the head.

No. 4. A very small brown frog*, almost impossible to see against a background of earth. It has a shrill, sharp call, kept up constantly unless approached, when it immediately ceases. It is very agile and extremely shy. It is marked with small black spots on a yellowish-brown, dark ground. Pale yellow underneath. When many of these frogs are croaking the sound produced is nearly continuous. The tympanum is evident. Found in damp waste ground outside Concepcion.

No. 5. A species of *Rana*, with dark brown markings on a greyish brown ground. A good deal of yellowish marking about it. Tympanum evident. Broad part of back without markings. Female.

No. 6. Female†. Abundant on the Camaloté leaves at Concepcion. Capable of changing its colour greatly, from bright green to dull brown. Underneath silvery. Two white streaks run backwards from the eyes. The call is a succession of sharp croaks or vibrations resembling the sound made by castanets and caused by the inflation of the throat. Until one is accustomed to the sight they are difficult to see, so well does their colour and small size protect them, but once seen, they are everywhere. They are very lively and hop quickly on the surface of the water by means of their hind feet, which are webbed right up to the tips of the toes. I found a small Gasteropod partially digested in the stomach of one of them.

No. 7. Male of same."

And again two days later:

"After coffee went out for a walk in the camp north of Concepcion. Found all the country under water from last night's storm. Soon heard a pretty note.

---

1 These numbers refer to the jars or bottles in which the specimens were preserved. The quotation shows the accurate and minute care which Budgett took in collecting specimens.

* Leptodactylus ocellatus, L.    † Leptodactylus bufonius, Blgr.    ‡ Pseudis limellum, Cope.

© in this web service Cambridge University Press
8  

J. S. Budgett

I could not tell at first whether it were bird or frog. The continual repetition from the same quarter told me that it was the call of a frog (No. 81) which I had not heard before. I stalked him for a considerable time, and at last saw, climbing over the blades of grass which were left sticking out of the water, a minute black frog with yellow and red spots. I stalked some more, but did not succeed in finding any but the two I had at first heard. On the way back I shot a fine brilliantly-coloured lizard. In the afternoon we walked across the island to the Mission Station. Cleaned guns and had tea. As we were passing homewards we saw the Indians catch two large Skates or Sting-rays², which were among the Camalote. While they were lying on the bank speared through the spinal cord the large one gave birth to fifteen minute skates, with external gills, which were long and filamentous. We secured them and then started off round the island with the canoe, arriving at 8 p.m. by moonlight. On my way up from the boat we caught another frog hopping across the street by moonlight.

_Frogs._ No. 8. Found in street after dark._

Collecting in the Chaco was not all fun; there was a good deal of discomfort, wet and storm; and beautiful and interesting as many of the creatures were, many of them were the reverse of attractive. On 27th October, 1896, he writes:

“We had been walking all the afternoon in water and long grass, and when we got within sight of the camp a violent storm of wind, lightning and rain came on; we had just time to shove all our things under cover when down came the rain, and huddling round the fire we ate our rice and got thoroughly soaked. The storm soon cleared off, and after a good warming I curled up under my mackintosh sheet and should have slept soundly but for a new pest, the _polvorino._

I was getting accustomed to mosquitoes and not to mind them so much, but these too fearful for words, smaller than the midge at home and infinitely more painful. They attack one in thousands, and make one think that Dante might have got some useful hints for his _Inferno_ by coming to the Paraguayan Chaco. Mosquitoer is useless, one can only wrap one’s head up in one’s rug.”

He took great interest in the natives, and recorded in the pages of his diary many observations on their habits and appearance. He also wrote down native vocabularies whenever he could get them. Writing about the Lenguas, a tribe who inhabit the Chaco, he says on 28th October, 1896:

---

³ _Phrynicus nigriventris_, Wigm.  
⁴ _Tessaria dumetii_.  
⁵ _Simulium sp._
Camp-Life

"There seems to be a great scarcity of boys about 16 years old, though a good many of about 12. The Indians often kill their babes for no apparent reason. If one of the community die the Toldo¹ is removed. The dead are buried where they die with knees to chin. The doctors are great tyrants. If a man is ill food is kept from him; this together with the baby slaughter seems to effectually prevent their becoming a dominant race.

All the Lenguas wear round discs of wood in their ears. In the first place they are mere twigs, which are frequently replaced by larger ones.

The women are all small and fat and sometimes nice-looking. The race as a whole is very tame and do not fight, neither are they intelligent, but quite childlike, especially in their improvidence. The boys are very sharp and jolly, quite like nice English boys.

While we have meals or write there are always some of these Indians sitting round watching us. Their only garment is the woollen woven poncho; these are very well made, and will fetch in the market 20s.—30s. They are of course very fond of beads, of which they only wear red and white. Their necklaces are made of various things, often pieces of Bulimus shell strung together or Cerbo² teeth. The men generally have the central part of their hair bound round in the shape of a stiff stick, which may lie forwards or backwards."

The life in the camp was very varied, and, owing to his keen interest in the anatomy and structure of all kinds of animals, Budgett spent much time in dissecting and in making many microscopic preparations. On 28th November, 1896, the following entry occurs:

"More bullock marking, continued dusty north wind and high temperature. The old bull gave a good deal of trouble, nearly hanging Mr Sibbet with the end of the lasso. Repaired camera, cleaned guns. Dissected young Ceratophrys, showing beautifully immature ovary and oviduct. Also the nervous system was exquisite, the sympathetic ganglia showing up bright orange. After tea went out with gun across the swamp and had a fearful time, rushes had grown high, some had fallen horizontally, so that at each step one's feet were sawn across by the fine teeth running along the under-surface of the midrib; socks were soon gone to shreds, and skin began to go. After half an hour's walk of this sort I reached the bird island, but was welcomed by such an attack from the garrison stationed there that I immediately turned and fled into the swamp.

¹ More correctly "Toldoria." Toldo is a hut or shelter; toldoria is a collection of huts or an encampment.
² Curicus paludosus.
again, fighting my way back to the Toldo, until I arrived pretty well exhausted, having only shot one small bird."

And two days later:

"Damp day, I walked round the Monte early. Found camera out of order; spent all morning and part of afternoon overhauling it. Mounted six slides in the afternoon. Mouth parts of Tabanos, Antennae of Dragon-fly, Mosquito male, Pulvorino and larva of some kind of beetle. Had two Ceratophrys brought me, also a beautiful caterpillar with orange skin and black tufts of hair. Philip brought me a fine chrysalis. We discovered that the ‘bicho’ which has been heard splashing in the pool is the glorious green frog. I must catch him.

1st December, 1896. At night before 6 p.m. the green Tree-frogs caught by the pool laid white eggs with abundance of firm jelly. Spent the whole day preserving eggs in various stages of segmentation in Corrosive Acetic, Flemming’s, Perenyi’s, and Van Beneden’s Fluids and in Formalin. In siesta time I photoed my laboratory and myself, developed in the evening.

2nd December, 1896. Preserved more eggs of green Tree-frog, but they appear to have died at the closing of the blastopore. Collected several Myriapods and began to make preparations of their external genital organs. After tea rode out on the black horse with Kerr, and had a fine bath, Tabanos very bad. At night a beautiful Mantis was brought in. Wind strong from north, it obliged me to put up awning. Beautiful specimens of leaf-mimicry in locusts came on to table at night.

3rd December, 1896. Wet morning, preserved more frog embryos, only a few apparently still alive, but in the afternoon discovered that I had still another batch tightly wrapped up in a leaf. These are all developing splendidly, and clear up the doubt as to how they are laid in nature, no water has had access to them, and yet they had developed far better than those to which I had allowed water and air free access. Apparently after the closure of the blastopore the epiblastic layer sinks downward, a milky fluid passing up through it. From this sunken area arises the blastoderm as a simple swelling, later stretching back to the swelling at the edge of the blastopore. Eggs are prominent and early developed. The neural canal closes over very gradually. The yolk sac became constricted off, the embryo curling over it, no tail is formed and rudiments of limbs are formed at once. Preserved one of the tree-frogs at night.

4th December, 1896. Preserved embryos of tree-frog in morning and dissected one also at 10 o’clock in the morning. External gills are well developed, and the circulation is going on, limbs not yet formed, tail now develops rapidly. Heart beating, optic involutions quite like chick. Auditory pits large; at 3 p.m. the first pair of gills greatly developed at expense of second pair. Blood red,

\[1 \text{ Pseudis paradoxus, Linn.} \quad 2 \text{ Phylomedusa hypochondriasis, Cope.}\]