

XXXIV.—*A Trip to Queensland in search of Fossils.*

By Dr. GEORGE BENNETT, F.L.S.

To the Editors of the Annals and Magazine of Natural History.

[GENTLEMEN,

I have been favoured by my friend Dr. George Bennett, F.L.S., of Sydney, New South Wales, to whom I was indebted for the specimen described in my 'Memoir on the Pearly Nautilus,' and for valuable materials while investigating the generative economy of the Marsupialia and Monotremata, with the following account of his excursions in quest of materials for the work on which I am now engaged, descriptive of the fossil mammals of Australia.

The notes of the localities and conditions under which these fossils are found may be, perhaps, not uninteresting to the readers of the 'Annals.'

RICHARD OWEN.]

" MY DEAR OWEN,

"It will no doubt cause you some surprise when you receive this communication informing you of my having visited Queensland, the principal object of my visit being with the view of examining the fossil deposits, collecting what I could during my short sojourn, and making arrangements with friends to aid me, by pointing out to them the localities on the creeks &c. most likely to be attended with success. That I was correct in considering those places I selected suitable was shown by the successful results attendant on my explorations, to the no little surprise of my companions. I left Sydney for Brisbane on the evening of the 3rd of November, and arrived at Brisbane on the morning of the 6th. The following day I was introduced to the Hon. J. P. Bell and other members of the Government; and Mr. Walsh, the Minister for Works, finding my visit was for scientific purposes, gave me a free pass over all the railways of the colony. Mr. A. B. Buchanan, M.L.A., also gave me a letter to Mr. Beattie, the superintendent of his station at Chinchilla, where he expected I should find some fossil deposits. The principal places I visited for fossils, and where I found, as others some years previously had also discovered, the richest deposits, were the Gowrie Creek, on the Gowrie station, the property of George King, Esq., M.L.A., of Sydney, and King's Creek, Clifton station, the property of W. B. Tooth, Esq. At the former place I received the kindest assistance from the proprietor's sons, Mr. George Beresford King and Mr. Henry King; at the latter a welcome and every aid from Mr. W. B. Tooth himself. The consequence was, in the very brief time allowed me to explore the creeks, the weather being fortunately very favourable, I made a collection which I hope you will find of some utility; moreover promises have been made to me by those gentlemen and many others to send me from time to time such specimens

as they may be able to collect; and this has already been done by Mr. G. B. King, first by a fossil crocodile's tooth having been left for me at Gowrie Junction station, on my return from Warwick, and afterwards by the discovery of some fossil jaws with teeth *in situ*, and an important tradition respecting these extinct animals obtained from one of the aborigines: this was embodied in a letter addressed to me at Ipswich, previously to my departure from Brisbane. The letter is dated 'Gowrie, December 1, 1871,' and is as follows:—

'Since you left we have discovered a few very valuable fossils; one, apparently belonging to the *Diprotodon*?, is almost a complete jaw, with all the molar teeth and the two front teeth similar to those in the lower jaw of the kangaroo as far as position is concerned, but being more round and without the sharp cutting-edges. Another is part of the left side of the lower jaw, seemingly part of the jaw-bone above described, and this has two perfect (molar?) teeth and one broken tooth; the others are vertebræ and smaller bones. I have had a long conversation with "Charlie Pierce," an aboriginal, relative to these fossils; and he avers that they are those of an animal long since extinct, known to the natives by the name of "Gyedarra." Tradition among them has handed down the appearance and habits of this animal for generations; but Charlie says he never paid much attention to the descriptions that have been given to him, but imagines the animal was as large as a heavy draught-horse, walked on four legs, the same as any other four-footed beast, eating grass, never went any distance back from the creeks to feed, and spent most of its time in the water, chiefly in enormous holes excavated in the banks. I told him he must mean some other animal; but he spoke most positively, and asserted that the bones we have been finding are those of the animal of which he was speaking, and that at one time the bones were very numerous about the Gowrie water-holes, where his forefathers had seen the animals themselves sporting about. I again asked him if they did not live on the leaves of trees; and his reply was that they were never seen to feed on them, but always on grass, the same as a horse or bullock. I will see if more specimens can be procured, and send them after you to Sydney.'

"On the 9th of November I left Brisbane for Ipswich by coach, and from Ipswich to Dalby by the railroad, where I arrived at 7 P.M. On the following morning I left Dalby for Jimbour, the station of the Hon. J. P. Bell, who had kindly invited me. There are no fossils to be obtained at this and other stations in the vicinity, except when wells are dug. A small jaw with well-preserved teeth was given to me by Mrs. Bell (probably of a kangaroo), which had been found on Jimbour Plains, 140 feet beneath the surface, when digging a well; a large bone had also been found with it, but was lost. A tusk given by Mrs. Bell to Mr. Anthony Trollope, when visiting this place a short time since, was also found on this station when forming another well. At another station near Jimbour, Mr. G. Morris Simpson, of 'Bon Accord,' near Dalby, presented me with

some fossil teeth and bones procured there, and with a memorandum accompanying them, dated Nov. 21, 1871, as follows:—‘The accompanying bones were dug out of a well which I have had made in the centre of the large plain which extends from Jondaryan on the Oakey Creek, on the north, to Yandilla, on the Condamine, on the south. They were got at a depth of about fifty feet from the surface, imbedded in a sort of sandy drift. It would seem to me as if the head of the animal had come in the line of shaft, the rest of the bones being probably on one side.’ I have all these bones kept together for your examination, with Mr. Simpson’s memorandum respecting them; they are fine tusks, but broken, and one perfect molar tooth, fragments of the skull, and other parts. On passing a station of Mr. Simpson’s, on the 16th of November, on my return from Jimbour to Dalby, I met him superintending the sinking of a well: no water had been found at a depth of 131 feet, but a quantity of small fragments of fossil bones, of no utility, and some teeth; the latter were small; he gave them to me, and they are sent to you.

“On the 14th of November, my son, Mr. G. F. Bennett, and myself left Jimbour for the Chinchilla station, the property of A. B. Buchanan, M.L.A., and arrived there on the 16th. Mr. Buchanan’s superintendent was absent; but one of the men pointed out to us a rock which Mr. Buchanan supposed contained a fossil head: this was not apparent; but several other rocks of a similar formation cropped out of the ground about 200 yards from the Condamine river, and near a deep gully which, during heavy rains, carried off the water from the higher range of hills into the river. The particular rock alluded to, said to contain fossils, was of small size, being only eight feet long by six feet in breadth; and the only fossils visible were fragments imbedded in a hard grit or breccia. The surface of the rock was with some force removed in flakes by the use of the pick, and with them some fragments of fossils; but the mass of the rock was so very firm as to resist all our efforts, and to completely blunt the edge of the pick. At this part, sloping down towards the gully, a quantity of fragments of fossil bones were found scattered over the surface, among which was a fossil kangaroo’s incisor tooth: all these are sent to you in the collection made at Chinchilla, together with some tusks, teeth, &c., collected by Mr. T. J. Beattie. We left Chinchilla on the morning of the 15th of November, and arrived at Warrawarra, the station of Mr. Henry Thorne, who informed me that he had a long time since some fossil bones, which he supposed were still about the house; but when he went in search of them, he found the children had thrown them away, he could not find out where; and thus, no doubt, many important fossils are lost to science. He, however, very kindly (more so as they were busy shearing at the time), took some men and drove with us to the banks of the river Condamine, on the station, where he thought some fossils might be found, when in a short time we procured those in the collection sent from the Warrawarra station. We

returned to Jimbour in the evening, a distance of fifty miles. On the 17th of November I arrived at Gowrie station, where, in the creek running through the station, so many important fossil bones had previously been obtained. I was at first at a loss how to commence my explorations; having no one with any previous knowledge of the places to direct me, I was thus left to my own resources. So I drove to the creek, but beheld at first only high banks, either with plain surfaces of red loam or rich black alluvial deposits, with a few plants scattered about, in some parts grooved with water-channels more or less deep, but nothing to indicate deposits, fossil or otherwise; or I came upon other portions of the banks dense with vegetation, where even the narrow running stream was in many places almost choked with the dense masses of reeds and rushes: all combined formed a scene most uninviting to an explorer of fossil remains. I soon left this useless part of the creek, and, driving a few miles further down, stopped, and then descending, walked along the banks for a short distance, and at last came upon a bank which excited my attention: it consisted of alluvial soil, with concretions of marl, strata of water-worn pebbles, and remains of perfect and broken univalve and bivalve shells. This locality I regarded as favourable for commencing my search for fossils; and I was right in my conjecture; for I was gratified, and still further induced to persevere, by finding several fragments of fossil bones imbedded in this bank. I then observed two teeth projecting from the soil, with the well-known dull-blue colour, from vivianite, and, by careful digging around it, obtained the portion of the jaw marked, in the collection sent to you, 'Gowrie, A'—the first acquisition of any importance. On excavating some distance around this specimen, not a vestige of any other portions of the jaw or any other kind of fossils could be discovered; but, extending my search in the same line to the bed of the creek, and close to where the water was flowing, I found a large lower portion of a femur deeply imbedded in the soil (marked Gowrie, B); and this explains how so many of the fossil bones are found in the bed of the creek, having been washed down from the banks during perhaps years of heavy rains and floods; and then, during the intense heat of summer, the creek became dry; for, as the man (an old shepherd) who drove me said, he was present when Mr. Isaac found and dug out the large head and other remains from the creek; but then, he stated, 'there was no running stream then, but only dried-up water-holes.' It was observing this peculiar formation of water-worn pebbles and shells on the banks that led me to suppose that the fossil remains were to be found in those localities where this stratum was found; and wherever I observed similar appearances on the banks of creeks, I explored them, attended with more or less success, and at last obtained a key to more successful explorations, which I afterwards followed up during my visits to Gowrie, and also when at King's Creek, Clifton, not forgetting, also, to examine the bed of the creek near those positions when the dry season would permit. By pointing out these localities

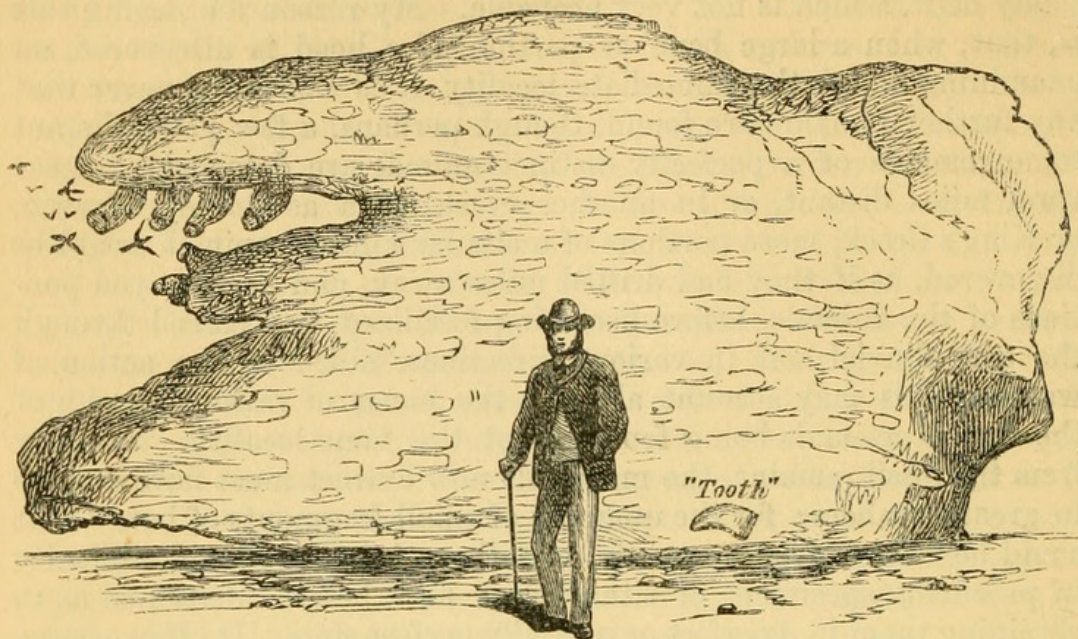
to others, they have been equally successful, as the acquisition of valuable specimens can testify; and my friends both at Gowrie and Clifton have promised to follow up the researches from time to time, and forward the specimens obtained to me. The univalve and bivalve shells, before alluded to as found both entire and in fragments in the strata, are still living in the creeks; and I have sent one of a species of *Unio*, or river-mussel, obtained in King's Creek, where both living and dead shells could be obtained in any quantity. The Darling Downs are plains of great extent, more or less undulating, with a background of hills of various picturesque forms, and ranges of mountains, some open forest, others densely wooded and in many parts edged with open forest, and diversified with dense scrubs of various species of *Eucalypti*, *Casuarinæ*, *Acaciæ*, &c. &c. The plains are rich in grass, growing in a fertile black soil, which extends to a great depth (to judge from some of the banks of the creek, from 30 to 40 feet, and from the digging of wells, from 121 to 157 feet), imbedded in which are often found concretions of carbonate of lime, many of which were shown to me. Dispersed through the grass are a number of beautiful flowering shrubs and plants, which enhance the beauty of the plains, especially after rains. Marl was also obtained both on the banks of the creek and in digging wells; and as marl consists of clay containing a small admixture of lime, binding it together into a loose crumbling kind of stone, it assumed various forms when dug out or seen on the banks; and it was often mistaken for fossil bones. I am inclined to consider that the plains of Darling Downs were originally lakes, similar to a lake now existing on the boundaries of the Halliford and St.-Ruth stations, called the 'Broadwater,' which is said to be about four miles in circumference and two miles across; but it is not of a great depth. When I saw it, the surface of the water was covered with a number of wild ducks swimming about, and at some distance I could perceive several black swans. This lake is surrounded by large trees of *Eucalypti* &c.; and in the water close to the flat shore dense masses of the white and also of the blue water-lilies (*Nelumbium*) were growing. It is probable that in the course of time this piece of water will also be filled up, and become similar to the downs.

"When sinking wells, after finding a great depth of rich black soil, the clay and sandy drift is arrived at, and then again an alluvial deposit (so it has been mentioned to me) to the depth of nearly 200 feet. When fossils are found in the bed of the creek or in the banks, they have no doubt been disturbed by the heavy rains which occur in this tropical climate, and have gradually drifted with the percolating water, together with pebbles, fragments of stones, shells, &c., through the soft soil towards where the waters naturally flow—that is, towards the creeks, where they have been found, and in most instances in a very friable condition; whereas when procured by digging wells, they are found in a perfectly dry condition, or nearly so. Thus, from what I have seen of the soft nature and scattered state of the bones when found, I do not consider it at all

likely that a complete skeleton will be found at one place, not even of the comparatively smaller extinct species of mammals, unless by some extraordinary chance an excavation should be made on a sandy drift, which is not very probable. My reason for stating this is, that, when a large bone or portion of a head is discovered, on examining about the immediate locality it is seldom or never that any further remains are found, though perhaps, a few yards distant some remains of a perfectly distinct animal are detected; but several miles distant, or in another creek, such as Oakley, Gowrie, or King's Creek, more portions of a similar kind of animal would be discovered, as if they had drifted miles away, and the decayed portions of the animals, before becoming fossilized, had passed through the soft alluvial soil in various directions, aided by the action of water. This may account also for the bones of various species of the extinct animals being found about the same locality. Judging from the fossil remains, the mammals now extinct must have existed in great numbers; for the quantity of small fragments of bones that could be collected is enormous, and there is not so much difficulty in procuring specimens in situations I have before mentioned as in obtaining them in a perfect or partially perfect state. It often occurs, when collecting fossils, that one observes a bone projecting from the soil, and, on digging around it, the slightest concussion, although apparently remote, will cause it to crumble into minute fragments. When excavated from the soil in a soft state, it is advisable to leave them untouched and exposed to the air, when they soon become hard and capable of removal. The height of the banks where the fossils were found varied from one to six or seven feet.

"On the 20th of November I left Gowrie for Dalby and Halliford station, having made during my short visit a very interesting collection of fossils, which are forwarded to you; and on the 23rd I returned to Gowrie, where a few fossils, collected during my absence, awaited my arrival, and were added to my collection. In the evening I left for Clifton station, by railroad, where I arrived at 7 P. M. On the following morning, in company with Mr. W. B. Tooth and his son, we explored 'King's Creek.' At this place, as at Gowrie, I pointed out the most probable places in which fossil remains might be found. King's Creek in many places is a noble stream of water; and it was only in the more shallow parts that we could pursue our researches with success. After a drive of some miles we observed an isolated conglomerate pebbly rock of some size, with the creek running close to it; we alighted and examined it. This boulder appeared as if it had been detached many years before from the adjoining bank; and under a shelving portion of it 'fairy martens' (*Collocalia Ariel* of Gould) had constructed their curious and elaborate bottle-shaped nests, in which white eggs and young just hatched were observed. This species always builds inland, and congregates about the squatters' verandas and near the water. This conglomerate rock (of which I have given a rude sketch) appeared to be likely to have fossils; and after some search,

resulting only in a few fragments, the perfect tooth (Clifton, A) was found at the base. This rock consists of marly concretions, in which



A conglomerate Boulder on the bank of King's Creek.

large and small pebbles or fragments of stone were imbedded, more or less rounded by the action of water. No more fossils were obtained from this rock after a further search. We afterwards explored other portions of the banks of King's Creek; but as this creek extends by its winding course over a large tract of country, much was left for future investigations. From my previous experience, I only explored those sites where I observed a similar stratum and appearance of the banks as obtained at Gowrie; and the result in a short time far exceeded my expectations. One circumstance I remarked at this place was, that, at the particular sites alluded to before, more fossils were found imbedded in the soft soil near the running stream of water in the creek than at Gowrie, having most probably been long since washed down by the heavy rains and floods from the banks, and left undisturbed. The collection obtained from this creek is sent to you; and having pointed out to Mr. W. B. Tooth the places where fossils might most likely be obtained, he has promised to send me any he may be able to procure. Thus in my brief visit to Queensland I so far attained the object I had in view when I left Sydney, not only to observe and judge for myself respecting the localities where the fossil remains you have described had been found (which I did not see, as no one at the station could identify the sites), but observe for myself in what particular situations additional fossils could most readily be found. This I did discover, and pointed out to others the areas most likely to yield them without unnecessary fatigue and loss of time. In this I consider I have in a great measure succeeded.

"I took with me to Queensland your memoir on *Diprotodon*, the

engravings of which excited the admiration of all who saw them. Many readily recognized several of the bones delineated, and expressed their surprise at the great accuracy with which they were represented, even, as many remarked, to the 'marks of age upon the bones.' The 'old bones' (by many considered useless, and thrown away, or which, as some informed me, were broken to discover if they were really bones or stones assuming their forms) they never imagined could be so treated by palæontologists, who they were not aware possessed the power, until they saw these works, of depicting the ancient race of Australian animals, re-forming them into living structures, imparting to these long extinct animals the motion of animated life, and, as fossils bear the marks of their relative antiquity, are enabled to fix the date of the rock in which they are found.

"I remain, my dear Owen,
 "Sydney, New South Wales.
 "Dec. 22, 1871."

"Your sincere Friend,
 "GEORGE BENNETT, M.D."

MISCELLANEOUS.

Osteology of the Solitaire.

To the Editors of the Annals and Magazine of Natural History.

GENTLEMEN,—Prof. Owen remarks on a statement in my former letter concerning an inquiry made of him:—"Had this been so, I could not have forgotten the circumstance." Now "this" *was* "so;" and I can therefore only regret his memory has so sadly failed him.

Whatever "incidental mention of the Solitaire's bones" might have been made "in one of the basement storerooms" of the British Museum, the particular inquiry in question was expressly put to him in his own room upstairs.

My brother, writing from Mauritius in December 1860, informed me that these bones had been sent to Prof. Owen; and when it became necessary for us to enumerate all the known remains of the Solitaire, we of course endeavoured to obtain particulars of them from him. To obtain these was one of the chief objects of our calling upon him at the time he mentions. He had previously by letter kindly made arrangements whereby we could examine the bones of the Dodo in the "storeroom," for which arrangements we thanked him.

Prof. Owen repeats the assertion that "he first learnt" our "interest in the subject" from our paper in the 'Philosophical Transactions.' This, as I have already said, is not the case any more than that he can have "satisfied" any inquirer into the fate of the specimens by the "information" he has given. His final disclaimer, in the same sentence, of intending any "imputation of carelessness" requires acknowledgment from me. I only wish it had been expressed sooner, but trust that, now made, it will end the matter.

I remain, Gentlemen,

Magdalene College, Cambridge.
 9 March, 1872.

Your obedient Servant,
 ALFRED NEWTON.



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