

CERATODUS FORSTERI POST-PLIOCENE.

BY C. W. DE VIS.

THE story of the *Ceratodus*, destined to close in Australia, opens in other lands and far bygone times. There is indeed an interest peculiarly our own in the pages of its record, for Queensland alone has been able to preserve in life the sole and probably the last descendant of its ancient race. But the first appearance of this strange lung-breathing fish was in the beginning of the middle ages—the mediæval era, so far as is known, of terrestrial life. It lived during the deposition of the mesozoic beds from the Keuper to the Oolite inclusive, and in the care of these sediments left occasional traces of the few forms in which it existed, then to all appearances it died out abruptly. The relics it gave to the rocks were by the nature of its organization rendered obscure and enigmatical, they consisted merely of bodies of one kind so strangely fashioned as to require all the ichthyological skill of an Agassiz to enable him to identify them as fish organs. He pronounced them to be teeth or rather dental plates, armed on their edges with horn-like projections, and, moved by the resemblance, he named the creature of whose personality they had formed part *Ceratodus* or 'horned-tooth.'

Unfortunately the specimens at the command of the great ichthyologist were but few in number, more unfortunately scarcely two of them were sufficiently alike to allow him to refer them to the same species; the necessary result was that he established almost as many names as he had examples. Shortly a greater body of materials was brought together in public and private collections, and the fact then became apparent that to continue to give to each different form a distinctive name would end in a *reductio ad absurdum*, for almost every individual would constitute a species. Observers were therefore forced to the conclusion that whatever the number of species might actually be, the individuals of each differed excessively in the form of their dental plates. Of many hundreds of specimens the majority were believed (and probably, rightly believed) by Professor Miall, their monographer, to belong to a single species, which he aptly named *polymorphus*: the rest were

grouped under at most three or four other specific names. Beyond some surprisingly accurate conjectures of Agassiz respecting the structure, habits, and rank in life of their possessor, no knowledge of their life history was obtained, and it seemed as though nothing further could be known, for as none of the littoral beds subsequent to the deep-sea deposits of chalk yielded a trace of its continuance, the genus was naturally conceived to be extinct. Being extinct it should according to all rule geological never have reappeared, but as if to warn us that a law whose sanction depends on future experience is but a law on sufferance, the fish after a term of oblivion measured by the deposition of the Cretaceous and Tertiary beds in all their enormous thickness, variety of conditions, and time consumption, is found lingering in two small rivers at the furthest remove from its original habitats. We are here reminded strongly of a case extremely and very interestingly analogous to that of *Ceratodus*. In the oolite and chalk rocks everywhere a genus of shells, *Trigonia*, occurs in specific and individual abundance, so much so, indeed, as to give to certain beds a name and character. But beyond the limits of the mesozoic strata *Trigonia* never appears in the older known parts of the world. It was therefore much to the surprise of geologists that *Trigonias* were in the course of research found still living in tropical seas, notably in those of Australia. In this case, indeed, the gap has been largely bridged, and the wonder diminished, by subsequent discoveries of *Trigonias* in the Pliocene and Miocene beds of Australia. And so it may happen with *Ceratodus*, for living in the interval of time it must have been, for living it is now, to declare emphatically the imperfection of the geological record. Living in the interval of space it most probably has been, for it has been discovered in the secondary rocks of Asia as well as Europe. But curiosity is not satisfied with the bare inevitable, or the bare probable, we want to know where and how it has maintained its geological existence; has it always been the companion of marsupial life as it was in the beginning, and is now at its end? Have the marsupial and the fish always lived together in Australia, as would seem to be suggested by the prevalence of oolitic characters in the Australian fauna, or have they perforce, terminated on our shores their slow retrocession before the adverse influences which have rendered each step in succession baneful to them? These are questions for the geologist to answer: the first of them for the Queensland geologist especially. For that answer I fear we must wait till the due distinction is made amongst us between geology and mining survey, and our geological staff

is employed on its proper work. Meanwhile though the rocks are silent their modern detritus has given some response to the question. Remains of Ceratodus have appeared in the post-pliocene drifts of the Darling Downs, and we now know that the fish inhabited the waters of Queensland before the present systems of its watersheds were established: that is, before changes, whether of surface levels or climate, had laid dry the area now traversed by the Condamine, and drained the swamps and lakes left for a time upon its basin. Protected by its aquatic surroundings from the full force of the new influences to which most of the land animals of the period succumbed, the Ceratodus saw them perish, but its survival was in those only of the present waters to which it had access, and which remained suitable to it: it was lost to those now running south, and to those which form the southern head of the Fitzroy; it remained in, or entered those only of the Mary and Burnett. To account for its presence in these rivers, we must suppose one of two things: either while still living in the Condamine area under the old arrangements of surface, its range was extended to that drained by the rivers mentioned by some of the known or unknown modes of distribution, or there ensued from some geological agency a solution of the continuity of the water area occupied by its then wider habitat. The question must remain open until the geologist has determined the date of the upheaval of the Bunya Range, so called, or of the filling up of its passes by basaltic overflows. The fact originating the question is that the Ceratodus, that is the living one, *C. Fosteri*, once existed in the Condamine: the proof of this must now be offered. Some years ago a tooth of Ceratodus, obtained from the Darling Downs, was submitted to the late Mr. Krefft. It was apparently so different to the teeth of the living species that Mr. Krefft regarded it as new and gave it the name of *C. Palmeri*, but, as I am assured, published no description of it; a notice of it, however, accompanied by a cast, was communicated to *Nature*, Feb. 12, 1874, p. 292. During the last year the collectors employed by the Trustees of the Queensland Museum obtained several other examples from the Chinchilla conglomerate in which they are associated with remains of crocodiles, turtles, &c. These are the specimens before the society and among them is the type of Mr. Krefft's *C. Palmeri*. It will be remembered that the Mesozoic teeth are in every character extremely variable, and the recent acquisitions fully maintain the family peculiarity, no two are alike in detail: but just as among the diversities presented by the fossil polymorphus we discern a general resemblance sufficient for their collection in one

specific form, so in the examples before us we can perceive an approximate similarity in their leading features which enables us to avoid the error of considering them all of different species and leads us to regard them as not only one, but one with the living *C. Fosteri*. They consist of four pterygopalatine plates and five mandibulary: of the pterygopalatine of the upper jaw, one of the left side is pretty complete, retaining the greater part of its pterygoid element and the basal portion of the process for articulation with the frontal cartilage, the utmost difference it presents from the recent bone is the more forward position of that process, which rises opposite the second anterior tooth instead of opposite the interval between the second and third: the contour of the inner edge of the dental is a continuous curve, as in the recent fish. The surface of the plate in this specimen is nearly smooth, but in the very young one accompanying it the surface is even more pitted than its living exemplar. The two largest of the mandibulary plates must have belonged to fish of considerable size, that is, about four feet long, their plates are rather more elongated than in the living fish, and consequently, less curved on the inner edge. In the best preserved the symphysial and angular elements are retained in much completeness. It is useless to dwell on the minute differences they show amongst themselves, and when compared with the recent specimen. Suffice it to say that after due consideration of the value to be given to the dissimilarities, we must arrive at the conclusion that one and all belonged to ancestors of the present species, *C. Fosteri*.





De Vis, Charles Walter. 1884. "Ceratodus forsteri Post-Pliocene." *The Proceedings of the Royal Society of Queensland* 1(1), 40–43.

<https://doi.org/10.5962/p.350995>.

View This Item Online: <https://www.biodiversitylibrary.org/item/138530>

DOI: <https://doi.org/10.5962/p.350995>

Permalink: <https://www.biodiversitylibrary.org/partpdf/350995>

Holding Institution

American Museum of Natural History Library

Sponsored by

BHL-SIL-FEDLINK

Copyright & Reuse

Copyright Status: Public domain. The BHL considers that this work is no longer under copyright protection.

This document was created from content at the **Biodiversity Heritage Library**, the world's largest open access digital library for biodiversity literature and archives. Visit BHL at <https://www.biodiversitylibrary.org>.