

MAY 12, 1847.

R. E. A. Townsend, Esq., J. Nicol, Esq., and W. A. Provis, Esq., were elected Fellows; M. C. H. Pander, of St. Petersburg, and M. Vicomte D'Archiac, were elected Foreign Members of the Society.

The following communications were then read:—

1. *On the Nomenclature of the Fossil Chimæroid Fishes.* By Sir PHILIP GREY EGERTON, Bart., M.P., F.R.S., V.P.G.S. &c.

IN a former communication to the Geological Society in 1843, I endeavoured to show that the fossils described by Dr. Buckland in his paper of November 1835, and referred by him to the genus *Chimæra*, presented differential characters of sufficient importance to warrant their separation from that genus. It was proposed to arrange them under three genera,—viz. *Ischyodus*, of which *Chimæra Townshendi* was the type; *Elasmodus*, typified by *Chimæra Hunteri*; and *Ganodus*, by *Chimæra Colei*. These generic distinctions were sanctioned and adopted by Professor Agassiz with the further elimination of certain species with falciform lower mandibles, such as *Chimæra Mantelli*, under the generic name *Psittacodon*. At that time I had not had an opportunity of examining the specimens discovered by Mr. Sibthorpe at Goldworth Hill, and described by Dr. Buckland in 1838 under the generic names *Edaphodon* and *Passalodon*, but having some fragments of the former genus, from Bracklesham Bay, I noticed the close resemblance of these to the other fossil Chimæroids, especially in structure, and alluded to it in the description of the upper maxillary bone of *Chimæra Agassizi*, and more pointedly in a subsequent paragraph referring to the general affinities of the recent and fossil Chimæroids. In the course of the present year I have not only seen the casts of Mr. Sibthorpe's specimens, from which the figures in the 'Poissons Fossiles' were drawn, but, through the kindness of Mr. Dixon, have had an opportunity of studying a series of specimens of these genera, in a very perfect state of preservation, from Bracklesham Bay. This examination has satisfied me that no distinction, of generic value, can be detected between *Edaphodon*, and *Chimæra Mantelli* of Dr. Buckland; consequently, if the latter be a true *Chimæra*, the former genus should be cancelled. The arguments I formerly advanced seem now to be generally accepted as warranting the exclusion of all the fossil species, hitherto discovered, from both the recent genera of Chimæroid fishes: indeed Professor Owen considers the distinctions of sufficient importance to exclude these fossils from the *family* to which the recent forms belong, and has added to Professor Müller's order *Holocephali*, a new family under the title *Edaphodontidæ*, for the reception of the fossil genera. I have before stated that Professor Agassiz subdivided the genus *Ischyodus*, ranging the species with falciform mandibles under the title *Psittacodon*. This is a natural and well-characterized division, but as these are the forms which so closely resemble the Bracklesham

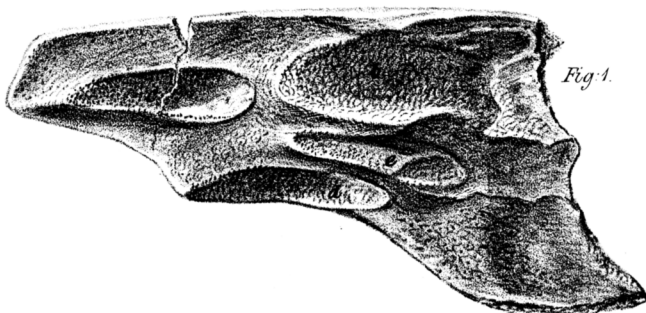


Fig. 1.

Fig. 2.

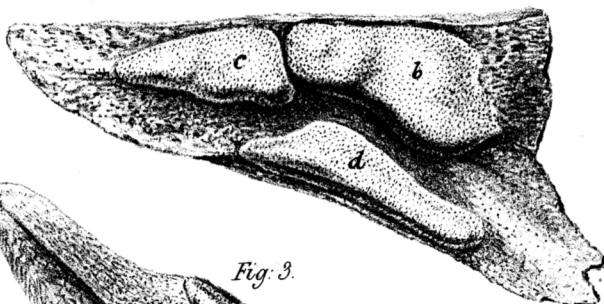


Fig. 3.

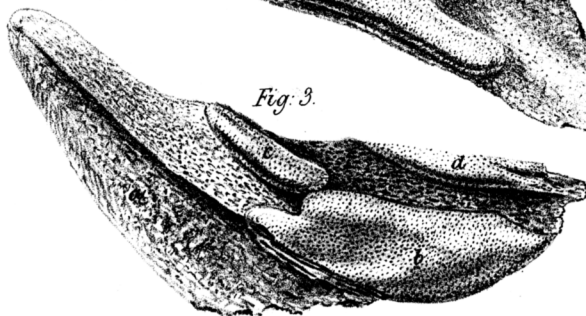


Fig. 4.



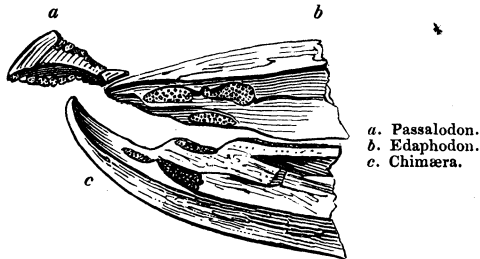
and Goldworth Hill specimens, I propose to place them under Buckland's genus *Edaphodon*, and to cancel the more recent name *Psittacodon*. The validity of this arrangement will be apparent by the following distinctive characters of the two genera. The lower maxillary of *Edaphodon* (Pl. XIII. fig. 3) differs from the corresponding part of *Ischyodus* (Pl. XIII. fig. 4) in being produced anteriorly into a falciform beak. The symphyseal facet (fig. 3 *a*) is broad at the base, and contracts gradually forwards until the margins meet at the apex. In *Ischyodus* the lower jaw is deeper, less produced anteriorly, and the margins of the symphysis (fig. 4 *a*) are parallel until abruptly truncated at their extremities. The upper maxillary of *Ischyodus* (Pl. XIII. fig. 1) is easily distinguished by the occurrence of a fourth triturating surface (Pl. XIII. fig. 1 *e*), situated between the large tubercle *b* and the marginal one *d*. This is wholly wanting in the corresponding bone of *Edaphodon* (Pl. XIII. fig. 2). The premaxillaries are comparatively rare in the fossil state, only three species having been found since the original Shotover specimens which first led Dr. Buckland to the discovery of the true affinities of these enigmatical fossils. I have assigned these forms to *Ischyodus Townshendi*, *Edaphodon Mantelli* and *Edaphodon gigas*, characterizing the two latter as being (compared with the former) broader, more compressed and less robust in antero-posterior diameter, and more hooked at their extremities. On looking over Mr. Bowerbank's collection of Bracklesham fossils not long since, I was led to imagine that the genus *Passalodon* might prove to be the premaxillary apparatus of *Edaphodon*. In favour of this idea the following reasons suggested themselves. The two genera have in every case been found associated together in the same strata, yet although both the upper and lower maxillaries of several species of *Edaphodon* have been discovered, the premaxillary has been hitherto a desideratum, while only one form of *Passalodon* has ever been brought to light. This form has a striking resemblance to the premaxillaries of the two species of Chimæroids now transferred to the genus *Edaphodon*. As to structure, the arrangement of the dental substance in distinct columns separated by septa of bone, is precisely that which occurs in the corresponding parts of the other fossils of this family. Upon communicating these views to Mr. Dixon, he wrote to me as follows: "I can bring forward very strong geological evidence in support of your opinion that *Passalodon* is part of *Edaphodon*, for I have found them together. The double upper jaw of *Edaphodon* which I possess, had portions of *Passalodon* with it." Since the receipt of this letter, Mr. Dixon has forwarded me a specimen of *Passalodon* which fully establishes the fact, for at the posterior extremity of the bone a flat articulating surface is preserved, corresponding accurately with the anterior articulating surface of the upper maxillary bone of *Edaphodon*.

Since my former communications on the Chimæroid fishes, the anatomical details of the dental apparatus of *Elasmodus* have been completed by the discovery at Sheppy and Bracklesham of the upper maxillaries and premaxillaries of *Elasmodus Hunteri*. The remarkable laminated structure which suggested the generic name, obtains

Genus and Species.	Description.	Synonym.	Reference.	Stratum.
GANDYUS, Egerton.				
— Bucklandi, <i>Egert.</i>	Lower maxillary	Chimera Collet, <i>Buck.</i>	Proc. Geol. Soc., vol. iv, pt. 1, p. 153.	Stonesfield Oolite.
— Collet, <i>Buck.</i>	Upper and lower maxillaries.		Agass., vol. iii, p. 346. Feuilleton 116	Stonesfield Oolite.
— curvidens, <i>Egert.</i>	Lower maxillary		Proc. Geol. Soc., vol. iv, pt. 1, p. 154.	Stonesfield Oolite.
— dentatus, <i>Egert.</i>	Lower maxillary		Supra.	Stonesfield Oolite.
— emarginatus, <i>Egert.</i>	Lower maxillary		Proc. Geol. Soc., vol. iv, pt. 1, p. 154	Stonesfield Oolite.
— falcatus, <i>Egert.</i>	Lower maxillary		Proc. Geol. Soc., vol. iv, pt. 1, p. 154	Stonesfield Oolite.
— neglectus, <i>Egert.</i>	Lower maxillary		Proc. Geol. Soc., vol. iv, pt. 1, p. 153	Stonesfield Oolite.
— Oweni, <i>Buck.</i>	Upper and lower maxillaries.	Chimera Oweni, <i>Buck.</i>	Agass., vol. iii, p. 347. Feuilleton 116	Stonesfield Oolite.
— pastinacatus, <i>Egert.</i>	Lower maxillary		Proc. Geol. Soc., vol. iv, pt. 1, p. 153	Stonesfield Oolite.
— rugulosus, <i>Egert.</i>	Lower maxillary		Proc. Geol. Soc., vol. iv, pt. 1, p. 154	Stonesfield Oolite.
ISCHYODUS, Egerton.				
— Agassii, <i>Buck.</i>	Lower maxillary	Chimera Agassii, <i>Buck.</i>	Proc. Geol. Soc., vol. ii, p. 206	Greensand and chalk-marl.
— Beudanticus, <i>Egert.</i>	Upper maxillary		Proc. Geol. Soc., vol. iv, pt. 1, p. 155	Kimmeridge clay, Boulogne.
— beudanticus, <i>Agass.</i>	Lower maxillary	Chimera brevirostris, <i>Agass.</i>	Agass., vol. iii, p. 344.	Gault, Folkestone.
— Dufrenoyi, <i>Egert.</i>	Upper and lower maxillary		Proc. Geol. Soc., vol. iv, pt. 1, p. 154	Kimmeridge clay, Boulogne.
— Dufrenoyi, <i>Egert.</i>	Lower maxillary		Proc. Geol. Soc., vol. ii, p. 206	Kimmeridge clay, Boulogne.
— Egertoni, <i>Buck.</i>	Upper and lower max. & premax.	Chimera Egertoni, <i>Buck.</i>	Proc. Geol. Soc., vol. ii, p. 206	Kimmeridge clay, Oxford.
— Egertoni, <i>Agass.</i>	Upper & lower max. & premax.	Chimera Johnsoni, <i>Agass.</i>	Agass., vol. iii, p. 344.	Lias, Lyons Regis.
— Tesonii, <i>Buck.</i>	Lower maxillary	Chimera Tesonii, <i>Buck.</i>	Agass., vol. iii, p. 342. Feuilleton 116	Oolite, Caen.
— Townshendi, <i>Buck.</i>	Lower maxillary	Chimera Townshendi, <i>Buck.</i>	Proc. Geol. Soc., vol. ii, p. 206	Portland beds, Milton.
EDAPHODON, Buckland.				
— Bucklandi, <i>Agass.</i>	Upper and lower maxillaries.	E. latidens, <i>Buck., sp. inedit.</i> ..	{ Proc. Geol. Soc., vol. ii, p. 687.	Bagshot sand and Bracklesham.
— eurygnathus, <i>Agass.</i>	{ Premaxillary	Passalodon, <i>Buck.</i>	Agass., vol. iii, p. 351.	
— gigas, <i>Egert.</i>	Upper maxillary		Proc. Geol. Soc., vol. ii, p. 687	
— helicticus, <i>Egert.</i>	Premaxillaries		Agass., vol. iii, p. 352.	Chalk, Worthing.
—	Lower maxillary		Proc. Geol. Soc., vol. iv, pt. 1, p. 211	Molasse, Switzerland.
— leptognathus, <i>Agass.</i>	Upper and lower maxillary	E. angustidens, <i>Buck., sp. inedit.</i> ..	Proc. Geol. Soc., vol. ii, p. 687.	Bagshot sand and Bracklesham.
— Mantelli, <i>Buck.</i>	Lower maxillary	Chimera Mantelli, <i>Buck.</i>	Agass., vol. iii, p. 351.	Chalk, Lewes and Worthing.
— Sedgwicki, <i>Agass.</i>	Lower maxillary	Chimera Sedgwicki, <i>Agass.</i>	Proc. Geol. Soc., vol. ii, p. 206	Greensand, Cambridge.
ELASMODON, Egerton.				
— Greenovi, <i>Agass.</i>	Lower maxillary	Chimera Greenovi, <i>Agass.</i>	Agass., vol. iii, p. 350.	Unknown.
— Hunteri, <i>Owen</i>	Lower maxillary	Odontography, p. 66	Odontography, p. 66	Sheppey and Bracklesham.
—	Premaxillary	Scaphodus, <i>Buck., inedit.</i>	Odontography, p. 66	Sheppey and Bracklesham.

in the upper as well as the lower jaw. The upper maxillary is provided with three triturating tubercles, as in *Edaphodon*, but the dentine of which they are composed is confluent, being rolled round like a scroll in the substance of the bone, one edge forming the margin of the tooth, the other buried deep in its centre. The premaxillary has long been known to Dr. Buckland, who, I believe, gave it the provisional name *Scaphodus*. It is a thin, incurved, scalpriform denticle rounded at the cutting edge. It has the lamelliform structure characteristic of the genus, but corresponds with the premaxillaries of the other members of the family in the columnar arrangement of the plates, although they are in juxtaposition and not separated by septa of bone.

Dental Armature of Edaphodon.



The alterations which will be required in the arrangement and nomenclature of the fossil Chimæroids are shown in the opposite table. I have added a species to the genus *Ganodus*, under the specific name *dentatus*. It is about the size of *Ganodus rugulosus*, but differs from that and the other species of the genus in having the cutting edge distinctly notched.

2. *On KENT'S CAVERN near TORQUAY.* By EDWARD VIVIAN, Esq.

In this paper an account was given of some recent researches in that cavern by a committee of the Torquay Natural History Society, during which the bones of various extinct species of animals were found in several situations.

MAY 26, 1847.

The following communication was read :

On the main points of Structure and the probable Age of the BAGSHOT SANDS, and on their presumed equivalents in Hampshire and France. By JOSEPH PRESTWICH, Jun., Esq., F.G.S.

[In consequence of the intimate connexion between the two following papers, the publication of the first, read 3rd February 1847, (see Proceed. vol. iii. p. 234) was delayed, at the author's request, in order that it might appear together with the paper read this day.]