Annals and Magazine of Natural History: Series 6

Publication details, including instructions for authors and subscription information:
<http://www.tandfonline.com/loi/tnah12>

XX.—Classification of the Pelecypoda: Fisher's families rearranged in accordance with Pelseneer's scheme

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Published online: 02 Oct 2009.

To cite this article: B. B. Woodward F.G.S. F.R.M.S. (1893)
XX.—Classification of the Pelecypoda: Fisher's families rearranged in
accordance with Pelseneer's scheme , Annals and Magazine of Natural
History: Series 6, 11:62, 156-159, DOI: [10.1080/00222939308677483](https://doi.org/10.1080/00222939308677483)

To link to this article: <http://dx.doi.org/10.1080/00222939308677483>

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as well as at the apex of the antenna, a few very much smaller hair-like structures somewhat similar to those to which an olfactory function has been usually ascribed. One of these, in close proximity to the organ in question, and two at the apex have a shape somewhat like that of a hand-bell. The remaining two at the apex are more or less cylindrical, with rather blunt extremities. Another on the third segment is shorter and broader and seems to have the form of a truncated cone.

It may be mentioned, in conclusion, that the presence of the "appendix" is not confined to the larvæ of a few genera of beetles. According to the observations of Schiödte and of Chapuis and Candèze it seems to be characteristic of the larvæ of Carabidæ, of Chrysomelidæ, and of certain other large families of Coleoptera, and that, though usually placed towards the outer or posterior side of the distal surface of the penultimate segment, it is, in the Staphylinidæ, situated on the anterior side.

The only other species in which I have had an opportunity of examining it was one of *Telephorus*, in which it had the same relation and pretty much the same general structure as in *Pterostichus*, the chief difference being that the chitinous ring, instead of having a uniform width throughout, is narrow at one side and extends upwards, to reach its greatest width on the opposite side. It was first noticed in this larva by the late G. R. Waterhouse, who referred to it as a "process."

Considering, therefore, the widespread existence of this appendix amongst Coleopterous larvæ, and of its very definite localization on the penultimate segment of the antennæ, together with its rather peculiar structure, it seemed to me that some elucidation of its precise nature and meaning was desirable. And even should it ultimately be proved that I have been mistaken in my first observations upon it, there will be some justification for having directed attention to a structure which seems to have been hitherto almost entirely neglected.

XX.—*Classification of the Pelecypoda: Fischer's Families rearranged in accordance with Pelseneer's Scheme.* By B. B. WOODWARD, F.G.S., F.R.M.S., of the British Museum (Natural History).

THE classification of the Pelecypoda has been from the first a matter of great difficulty owing to their comparatively uniform structure.

The characters hitherto employed have been more or less

superficial in their nature. Thus the muscular impressions were for a long time solely relied upon; but an arrangement based on the existence of only one or of two adductor muscles, and, in the latter instance, on their relative size, proved unsatisfactory. Nor did the change in favour of the presence or absence of siphons and of a pallial sinus yield any better result; whilst classification based on the form of the foot is now no longer even thought of.

Neumayr, regarding the matter from a palæontological point of view, suggested a system based on the hinge characters*, which, however, does not satisfy the student of living forms.

Fischer, going deeper, made use of the respiratory organs †, but, misled by their external appearance, divided the class into two-gilled and four-gilled groups, ruthlessly sundering closely related families in the process.

Pelseneer it was who first, in 1889 ‡, pointed out the true reading of the Pelecypod gill-structure and founded on the morphology of that organ a classification which, though doubtless not final in minor details, promises to be by far the best of any.

It is extremely interesting to note that Pelseneer forestalled by but a very short time an independent worker, Ménégaux, who had arrived at almost precisely similar conclusions §.

Yet another classification has recently been proposed by Prof. C. Grobben ||. In this the external form of the gill is taken as a primary character, whilst the hinge is relied upon as the secondary basis of the arrangement. The result,

* "Zur Morphologie des Bivalvenschlosses," Sitzb. k. Akad. Wissensch. Wien, Bd. lxxxviii. Abth. i. (1884), pp. 385-419. The amplification of which, so far as completed at the time of his death, appeared in the Denkschr. vol. lviii. (1891), pp. 701-801.

† "Manuel de Conchyliologie" (1886-87).

‡ "Classification phylogénétique des Pélécypodes (communication préliminaire)," Bull. Scient. France et Belgique, tom. xx. (1889), pp. 27-52; the complete memoir was published as "Contribution à l'étude des Lamellibranches," Arch. Biol. (Liège), xi. (1891), pp. 147-312, 18 pls.

§ In fact his first note, "Sur la Branchie des Lamellibranches et sur la comparaison avec celle des Scutibranches," Bull. Soc. Philom. sér. viii. tom. i. (1889), pp. 137-144, was elicited by Pelseneer's "preliminary communication," the full text having been sent in as a Thesis, which was afterwards published under the title 'Recherches sur la circulation des Lamellibranches Marins' (4to, Besançon, 1890).

|| "Beiträge zur Kenntniss des Baues von *Cuspidaria* . . . nebst Betrachtungen über das System der Lamellibranchiaten," Arb. Zool. Inst. Univ. Wien, x.; the latter section also appeared in Zool. Anz. xv. (1892), pp. 371-375, whilst diverse translations are given in Journ. R. Micr. Soc. 1892, p. 772, and Nat. Sci. ii. p. 9.

however, as set forth by the author will hardly commend it to practical malacologists.

Pelseneer's scheme appears so decidedly in advance of the others that after consultation with my friend and colleague Mr. E. A. Smith it has been decided to adopt it in future volumes of the 'Zoological Record,' retaining Fischer's families as far as possible for the present for the sake of convenience in reference.

Since, however, the 'Zoological Record' does not admit of the new arrangement being shown in its entirety, it seems fairer that it should in the first instance be published where it will be available to all in a handy form.

Hitherto only the relationship of the main groups has been published, and that in a "tree" which should be studied in conjunction with the linear arrangement that here follows; for in the latter of course the essential features of the "tree" cannot be reproduced, though some help is sought to be given by "indenting" those families which lie on the divergent branches and placing them between "rules," after the method familiar in a railway time-table.

The three families not in Fischer are printed in italics.

Class **PELECYPODA.**

Order I. SEPTIBRANCHIATA.

Fam. 1. *Poromyidæ* (*Poromya* and *Silenia*).

2. *Cuspidariidæ*.

Order II. EULAMELLIBRANCHIATA.

Subord. i. ANATINACEA.

Fam. 3. *Clavigellidæ*.

4. *Pholadomyidæ*.

5. *Præcardiidæ*.

6. *Grammysiidæ*.

7. *Anatinidæ* (excepting *Poromya*).

8. *Arcomyidæ*.

9. *Ceromyidæ*.

10. *Lyonsiidæ* (excepting *Silenia*).

11. *Verticordiidæ*.

12. *Chamostreidæ*.

13. *Pandoridæ*.

Subord. ii. PHOLADACEA.

Fam. 14. *Teredinidæ*.

15. *Pholadidæ*.

16. *Gastrochænidæ*.

Subord. iii. MYACEA.

Fam. 17. *Solenidæ*.

18. *Glycymeridæ*.

19. *Myidæ*.

20. *Lutrariidæ*.

Subord. iv. CARDIACEA.

Fam. 21. *Radiolitidæ*.

22. *Hippuritidæ*.

23. *Caprinidæ*.

24. *Monopleuridæ*.

25. *Chamidæ*.

26. *Tridacnidæ*.

27. *Lunulicardiidæ*.

28. *Cardiidæ*.

Subord. v. VENERACEA.

Fam. 29. *Psammobiidæ*.

30. *Cyrenellidæ*.

31. *Rangiidæ*.

32. *Cyrenidæ*.

33. *Glaucomyidæ*.

34. *Petricolidæ*.

35. *Veneridæ*.

36. *Pachydomidæ*.

37. *Cyprinidæ*.

38. *Megalodontidæ*.

Subord. vi. TELLINACEA.

Fam. 39. Scrobiculariidae.

40. Tellinidae.

41. Donacidae.

42. Cardiliidae.

43. Mesodesmatidae.

44. Mactridae (excepting
Lutraria).

Subord. vii. SUBMYTILACEA.

Fam. 45. Galeommidae.

46. Erycinidae (excepting
Montacuta).

47. Kellyellidae.

48. Crassatellidae.

49. Tancrediidae.

50. Unicardiidae.

51. Ungulinidae.

52. Lucinidae (including
Montacuta).

53. Astartidae.

54. Carditidae.

55. Cardiniidae.

56. Ætheriidae.

57. Unionidae.

58. *Dreisseniidae*.

59. Modiolopsidae.

Order III. PSEUDOLA-
MELLIBRANCHIATA.

Fam. 60. Ostreidae.

61. Aviculidae.

62. Prasinidae.

63. Pectinidae.

64. Limidae.

65. Spondylidae.

66. Dimyidae.

Order IV. FILIBRANCHIATA.Fam. 67. Mytilidae (excepting
Dreissensia and *Dreis-*
sensiomya).

68. Trigoniidae.

69. Arcidae.

70. Anomiidae.

Order V. PROTOBRANCHIATA.

Fam. 71. Solenomyidae.

72. Nuculidae.

XXI.—Notes on Apteryx Haasti.*To the Editors of the 'Annals and Magazine of
Natural History.'*

GENTLEMEN,—In the last number of the 'Annals,' page 43, I observe an article on *Apteryx Haasti*, Potts, by the Hon. Walter Rothschild. "Mr. Forbes," it affirms, "has expressed it as his opinion that *Apteryx Haastii* is a natural hybrid between *A. australis* and *A. Owenii*. I have paid much attention to this question as well as to the study of this genus generally," &c.

I am not sure whether or not I am the "Mr. Forbes" referred to; but as I am led to believe that I am, I hope you will grant me the privilege of making a few observations on Mr. Rothschild's note. I am surprised, in the first place, to have opinions that I privately entertain publicly criticized; for, so far as I can charge my memory, I am not aware of having