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XVII.—*Observations on the Whales described in the ‘Ostéographie des Cétacés’ of MM. Van Beneden and Gervais.*

By Dr. J. E. GRAY, F.R.S. &c.

THE genus *Balaena* in the ‘Ostéographie des Cétacés vivants et fossiles,’ by MM. Van Beneden and Paul Gervais, being finished, and containing many observations on my three essays on the Cetacea, especially on the ‘Catalogue of Seals and Whales in the British Museum,’ published in 1866, I herewith send you some remarks upon it.

I believe that this beautiful and expensive work was undertaken and published at the cost of my esteemed friend Prof. Van Beneden; and the naturalists of every country are much indebted to him for his liberality in laying before them such an excellent series of figures of the skeletons of the Cetacea, especially those contained in the Paris and Louvain collections. It is to be regretted that he was not able to select a colleague in this work who had paid more attention to the osteology of this group and possessed a more philosophic spirit; for M. Gervais’s previous short essays on the Cetacea of France, published in his ‘Zoologie et Paléontologie de France,’ showed a very limited knowledge of the subject; the text of this work has more the appearance of having been written to order than of being a labour of love; and M. Gervais has in this hasty compilation made several mistakes, which a more leisurely study of authors would have enabled him to avoid. He might, too, have improved the plates if he had adopted a more systematic distribution, after the manner used successfully by Mr. Flower in the osteology of the Sperm and other Whales.

In the preliminary history of the exotic species he has made very free use of the materials which I had compiled under *Ann. & Mag. N. Hist. Ser. 4. Vol. vi.*

each species in the Catalogue of Whales ; but he has worked them up into a short narrative, where I quoted the very words of the authors themselves. That he has compiled these observations second hand, is proved by the fact that in many cases he does not know the title of the work from which the materials are extracted.

As usual in many Continental works, there is a great inclination to regard all the species that are not in their museums as varieties of those they have : this leads them, when they receive examples of the species themselves, to describe them as new, which has produced much confusion in studying the geographical distribution of species.

I have been much blamed and ridiculed for applying the same rules to the study of recent whales, as distinguished by their bones, that palæontologists have been in the habit of using. In this work numerous species and even genera of whales have been established on very imperfect fossil skeletons, or even on a few bones ; and, as I before said, I cannot see why, when one receives a single bone or blade of whalebone which, on comparison with the same bone or baleen of the different known whales, is found to be different from them, one may not conclude that it is a distinct species, characterized by the peculiar character of that bone or other part of the animal. Yet, because I have done so, while M. Gervais regards his fossil species as well established, he talks of the recent species so described as if they were not worthy of notice. Experience, however, has proved that the course I followed is the best for science : for example, having shown that there was a true whale with small baleen in Australia, thus causing the whale to be sought for, now we have the skull showing that it is a most distinct species and an entirely new form ; and it has been the same with other species so indicated from small materials.

Great objection has been made to my having divided the whales into so many genera ; but there can be no doubt that it has a great deal of influence on extending the knowledge of these animals ; for it puts in a short compass the characters by which the species can be distinguished, and thus proves their distinctness. It is impossible not to see the influence of this system on the work before us, the authors of which have been most unwillingly forced to admit many species which were formerly denied : for example, naturalists (M. Van Beneden among the number) would persist in saying that there was no difference in the skeletons of *Balaena longimana* of Europe and of the Rorqual du Cap ; but, after I had pointed out the character by which they were distinguished, M. Van Beneden wrote a

paper to prove that they were distinct; and in this work these distinctions are pointed out by the figures.

In the same manner, Eschricht did not believe in the existence of more than one species of Finner, until I convinced him by taking him to see the skeleton at Blackgang Chine; but in this work several species of *Megaptera* and *Balaenoptera* are admitted.

It is to be remarked that M. Gervais gives no characters by which to distinguish the species from each other. We have only the habitat of the whale to guide us; and if that is wanting, we must read over each of the descriptions; whereas in my generic characters the most important characters which distinguish the different species may at once be seen.

The number of known whales has, since I began the study, very greatly increased; and I believe that as yet we do not know half of those that exist and are to be distinguished by very decided osteological characters.

It is curious that in this work the whalebone is only slightly referred to under one or two species, and never figured; and this is the more remarkable as the authors in their titlepage specially refer to the dentition of the different species. It is true that the whalebone is not the homologue of the teeth of other Cetacea, as it was formerly supposed to be; but it forms as good characters for the separation of the families, genera, and species as the teeth afford in other mammalia. Indeed it was the very evident difference existing in different kinds of whalebone that first convinced me that Cuvier and other Continental zoologists were misled when they attempted to prove that there was only one species of Hunchback or Finner whale.

These authors, at any rate, have reduced the number of genera to a minimum: thus they only admit three—*Balaena*, *Megaptera*, and *Pterobalaena*. The common whalers, two centuries ago, were far in advance of them on this head, as well as in the distinction of the different kinds of whalebone and of their adaptability to different economic purposes. They unanimously admit five distinct kinds of whales, which I am inclined to regard as distinct families, each containing several species living in different localities:—1st, the Whales proper, or Right Whales (*Balaenidae*); 2nd, the Scrag Whales (*Agaphelidae*); 3rd, the Hunchbacks (*Megapteridae*); 4th, the Finners (*Physalidæ*); 5th, the Pike-whales (*Pterobalaenidae*).

M. Van Beneden has discovered some abnormalities in the first rib of some of the common whales, and publishes them in the Proceedings of the Academy of Sciences of Brussels, 1868, p. 65. He figures two of these variations—one of *Balaenoptera laticeps*, and the other of *Phocæna communis*. He

seems therefore inclined to believe that the differences between animals which have single-headed and double-headed ribs are mere accidental variations. I must regard this as a very large conclusion from very small premises. I believe (and, I think, on very good evidence) that there are certain whales in which the double head to the first rib is the normal form; and I should not the less be inclined to believe that this was not the case if I should find a whale of this kind that had the first rib on one side single-headed; for, no doubt, whales with single- and double-headed first ribs are each liable to such an accidental malformation, and it is to be remarked that there is a difference in the general form of the rib connected with the form of its head.

This theory of M. Van Beneden has induced him to regard the skeleton of the whale that was sent from the Cape by Mr. Horstock to the museum at Leyden, which has been called *Balaena antarctica* and *Hunterius Temminckii*, as only a variety of *B. australis*; but he even records many important differences between it and the two skeletons of *B. australis* in the Paris Museum: to be sure, its specific distinctness is opposed to one of his theories that only one species of whale is found in each district or locality. It is much to be regretted that preconceived theories should, as in this case, bias the judgment of a student of natural science. This theory seems also to have considerably interfered with the determination of the species of *Balaenoptera*.

M. Van Beneden has republished in this work, with some alteration, his essay on and map of the distribution of species of whales, on which I published some observations in the 'Annals and Magazine of Natural History,' 1868, vol. i. p. 242.

I have studied the materials which this work affords, and I do not see any reason to alter the conclusions I came to; indeed they are more firmly established. There does not appear, from any of the habitats quoted in this work, any authority for believing that the whales do inhabit a belt across the oceans. To be sure, under *Balaena australis* of the Cape, he quotes the fact that a Right Whale has been recorded as found on the east coast of South America; but he does not cite any specimens or drawings to show that the Right Whale of the east coast of South America is the same species as that found at the Cape of Good Hope: indeed the only approach to any argument in support of this theory is that he believes *Balaena cisarctica* of the east coast of North America to be the same as *B. biscayensis*. As this last-named whale appears to take an important part in this theory, I will proceed to give its history.

Balaena biscayensis, as a zoological species, rests on very slender grounds. There were formerly, according to various authors, whale-fisheries in the Bay of Biscay and in the British Channel; but it is not proved that the Greenland whale had not a more extended distribution than at present, after it has been the object of capture for so many years, and, on the other hand, that the specimens that wandered far away from the usual habitat of the species would not become smaller, less fat, or more active than the others, which were better fed. The same argument may explain the difference observed by whalers in the size and form of the whales caught on the coast of Iceland and the east coast of Greenland. At the same time I would not deny that the whales of this latter place may not be a different species; but as yet we have not sufficient materials for separating and characterizing them.

In 1834 a female whale and its young were captured at St. Sebastian, and the skeleton of the young remained for some time at Pampeluna; it has since been removed to the museum at Copenhagen: and this is the specimen which has been named *Balaena biscayensis* by Eschricht, who gives an account of it in the 'Comptes Rendus' for 1860, and in the 'Actes de la Soc. Linn. Bordeaux,' vol. xiii.; and he thinks that he observed in the development of the various parts of the skeleton a difference from that which he had observed in the skeletons of *Balaena mysticetus*. But we must recollect that this was to support a theory that the latter whale was exclusively confined to the Polar seas and that the Right Whale of the North Atlantic must be different; but I do not see why, as the icebergs are annually carried out by the currents from the Arctic Sea to the North Atlantic, the Right Whale may not sometimes come down with them.

I have only Mr. Flower's note of the Pampeluna skeleton (Annals, 1868, vol. i. p. 244); and although it is now at Copenhagen, there is no description or figure of it in MM. Van Beneden and Gervais's 'Ostéographie des Cétacés.' The *Balaena biscayensis* of these latter authors is founded on what appear to me to be very incongruous materials, which would require a great stretch of credulity to believe that they belong to the same whale; I am sure that two of the specimens do not; indeed the authors seem to express a doubt with regard to one themselves. But the only ground on which they are united is that all the specimens were procured from the North Atlantic, together with the preconceived idea that only one whale can inhabit that region.

First, they rely on a mass of cervical vertebræ which probably came from the Mediterranean; it is figured by Lacépède,

tab. vii. fig. 1. But there is much uncertainty attached to these vertébræ. Lacépède observes:—"Le 30 ventôse de l'an 6 de l'ère françoise, un cétacé de vingt mètres de longueur fut pris dans la Méditerranée sur la côte occidentale de l'île Sainte-Marguerite, municipalité de Cannes, département du Var. Le citoyen Jacques Quine en fit un dessin, que j'ai fait graver; et bientôt après, les fanons, les os de la tête et quelques autres os de cet animal ayant été apportés à Paris"

Although these bones are said to be those of one whale, they evidently belong to two genera: the head, the baleen, and probably the vertébræ (tab. vi. and tab. vii. figs. 2, 3, 4) all belong to a Finner (or *Balaenoptera*); Cuvier refers to these bones under the name of "Rorqual de Méditerranée" (*Os. Fossiles*, vol. v. p. 383). The mass of cervical vertébræ, on the other hand, are, as observed by Cuvier (*ibid.* p. 368), the bones of a true whale; so that the authority for this mass having been found in the Mediterranean may be doubtful. These cervical vertébræ are figured by MM. Van Beneden and Gervais as those of *B. biscayensis*; they differ very slightly from the similar bones of *Balaena mysticetus*; and without other specimens, I should suppose them to be a mere individual variety of that species. At any rate, it ought to be called *Balaena mediterranea* rather than *biscayensis*, unless it can be proved that they are like the cervical vertébræ of the only skeleton of the whale found in the Bay of Biscay; and no such comparison is recorded. Cuvier, not knowing the cervical vertébræ of *Balaena mysticetus*, compared them with the bones of the Cape whale, *B. australis*, and correctly determined that they were distinct from those of that species.

Secondly, MM. Van Beneden and Gervais place among the materials which are supposed to belong to *Balaena biscayensis* a mass of cervical vertébræ which is in the British Museum, and which was dredged up on the coast of Lyme Regis (figured in the 'Catalogue of Seals and Whales,' p. 83, and copied in the 'Ostéographie des Cétacés,' tab. 7), justly observing that this mass of bone differs more from the vertébræ of *mysticetus* than the one figured by Lacépède and themselves. This mass is much more allied to the cervical vertébræ which I have named *Macleayius australiensis* (figured in the 'Catalogue of Seals and Whales,' p. 105. figs. 10 & 11, and p. 372. figs. 74 & 75), and, I am certain, belong to species very different from the one they have figured as coming from the Mediterranean. They also mention some lumbar vertébræ taken at Ostend, and some other bones which they think may have been found on the coast of the British Channel.

Thirdly, they regard the *Balaena cisarctica* of Cope as a

synonym of *Balaena biscayensis*, and figure the ear-bones of that North-American whale as those of this species. The origin of this reference is curious, and probably was the innocent origin of M. Van Beneden's theory of the distribution of whales. When Cope described this species, he said that it was probably the same as that of the Biscay whalers; but, as there is no figure or description of the whale which formerly inhabited the coast of the Bay of Biscay, he could not have any firm grounds for establishing the fact. However, MM. Van Beneden and Gervais adopt it as a certainty, and consider *B. cisarctica* of Cope a synonym of *B. biscayensis*, and take advantage of the presumed identity of the species found on the two sides of the Atlantic, in nearly the same parallel of latitude, to form a theory which they apply to the geographical distribution of the other whales. Mr. Cope has sent some specimens of the ear-bone of his *Balaena cisarctica* to M. Van Beneden; but as the ear-bones of the Biscay or even the Mediterranean whale are not known, they can in no way have any bearing on the question; they only prove that *Balaena cisarctica* is distinct from *Balaena mysticetus*; for the authors state, and the figure shows, that they are very much like the ear-bones of *Balaena australis* or the larger Cape whale.

I think that there is not at present any material to make out what the *Balaena biscayensis* of Eschricht is, and that the *Balaena biscayensis* of these authors is made up of the bones of various whales.

The number of ports on the European side of the North Atlantic, and the immense number of vessels of all kinds that are daily crossing and recrossing its surface, have long since deprived it of any place in which the adult whales could congregate, or any quiet bays where the females could retire to bring forth their young; therefore whales are as completely exterminated in that district as wild boars, wolves, beavers, bustards, and other animals are in Great Britain. It is not quite so bad on the American shores of the Atlantic; for there are still large and secluded bays where they can live and bring forth their young; and whales are more or less frequently captured there, but not so commonly as formerly, when there were whale-fisheries established there long after they had ceased off the eastern shores.

Maury, in his Charts, records the Right Whale as having been several times obtained in the mid-channel of the North Atlantic by the South-Sea whalers in proceeding on their voyages either out or home; and it has hitherto been supposed that these are whales which have wandered out of the

Arctic seas; but we cannot be certain on this point, as no remains of any specimens so taken are known to exist. These charts, I need not observe, give no support to M. Van Beneden's theory of whales inhabiting bands across the different oceans.

The whales of the North Atlantic, including the Mediterranean Sea, of which we have more or less reliable remains, are five in number. Thus on the east coast there are:—

1. *Balaena biscayensis*, Eschricht, which, I believe, is a *Cuvierius* with a double-headed first rib.

2. *Balaena biscayensis*, Van Beneden and Gervais—as distinct from *B. biscayensis* of Eschricht, resting on the mass of cervical vertebræ figured by Lacépède. Whether this is a distinct species or only a variety of *Balaena mysticetus*, there cannot be the slightest doubt of its being distinct from the following.

3. *Balaena britannica*, Gray, established on the mass of cervical vertebræ which is in the British Museum, before referred to, and which was dredged off the coast of Lyme Regis. The processes of the atlas and other cervical vertebræ are much more like those of the Australian Black Whale (*Macleayius australiensis*), and are very unlike the vertebræ of any other whale yet described; there is no doubt that they belong to a distinct species.

On the west coast there are also two very distinct species, which are so distinct from one another that Cope refers them to two different genera, the latter genus belonging to a section of *Balaenidae* characterized by having the cervical vertebræ free and only four fingers to the pectoral fin:—

4. *Balaena cisarctica*, Cope, who believes it to belong to the genus *Eubalaena*, and more allied to *B. australis* than to *B. mysticetus*; and the description of the cervical vertebræ at once separates it from the *B. biscayensis* of Van Beneden and Gervais, as they would have seen if they had read the description.

5. *Agaphelus gibbosus*, Cope. See Cope, Proc. Acad. Phil. 1868, p. 225, the Scrag Whale of Dudley, which is still now and then caught on the coast of America by the whalers, and is known by the same name as when it was described by Dudley. It is found in company with *Balaena cisarctica*, which is not uncommon on the same coast (see Proc. Acad. N. S. Phil. 1868, p. 223). It is, indeed, remarkable that so curious a whale, forming quite a distinct family from *Balaena*, of which there are a good many remains in America from which figures could be easily procured, is entirely left out in a work professing to give the osteology of the Cetacea!

For the sake of the symmetry of the theoretical distribution of whales, it is necessary that there should be a species ex-

tending across the North Pacific as the supposed *Balaena biscayensis* is said to extend across the North Atlantic: therefore, though MM. Van Beneden and Gervais doubt the existence of *Macleayius australiensis*, of which there are cervical vertebræ and, I believe, many other bones in the museum at Sydney, and *Balaena marginata*, which is so peculiar for the beauty and the small size of the blades of whalebone on which it was founded, and of which we have now got the skull, they consider established a species which they call *Balaena japonica*, allowing that the only authority on which their species rests is a porcelain model of a whale received from Japan, the existence of some blades of whalebone from the north-west coast, in the British Museum, and the existence of a foetus of a whale in the museum at Copenhagen. But they do not inform us why they regard this foetus as that of a Japanese whale, or give us any particulars of how or whence it was obtained.

I do not mean to deny that whales are abundant on the Japanese coasts; and we know well that they and the Americans and the English formerly did carry on whale-fishing in the North Pacific; but I believe that, instead of one whale being found in those seas, from the various names which whalers give to them, several species exist. Indeed Mr. Cope notices that several species, which he believes to belong to different genera, are found on the north coast of America; and we wait with anxiety for materials from the Japanese (who are excellent whalers) and from the American whalers, to make us fully acquainted with the whales which inhabit these seas. "Lumping" them all together into a single species, as has been done by these authors, is certainly not conducive to the extension of science.

I am very glad to see that we are becoming better acquainted with the whales of the North Pacific; for in a series of plates just published by Prof. Reinhardt, in Vid. Selsk. Skrivi. ser. 5. vol. ix. p. 1: Kjöbenh. 1869, he figures on pl. 1 a foetus, $5\frac{1}{4}$ feet long, which he calls *Balaena japonica* (Lacép.), with the first rib not split, that is, single-headed, taken out of a whale caught on the coast of Kamtschatka by a Danish whaler, Södring. The skull and remaining skeleton are preserved in spirits in the University museum of Copenhagen. The skull is figured; and one of the figures is very interesting, as showing its original segmentation. This specimen is doubtless the one quoted by MM. Van Beneden and Gervais, and referred to above. But, unfortunately, the very undeveloped state of the skeleton of this foetus does not afford us any character to distinguish it from the other whales.

The whales of the northern part of the Pacific have had names enough given them:—

1. *Balaena Kuliomoch*, Chamisso (Nov. Acta Natur. tab. 7. fig. 1; *Balaena culammak*, Pallas, Zoogr. Ross.-Asiat. i. p. 288; Cope, Proc. Acad. N. S. Philad. 1868, p. 225, 1869, pp. 17 & 40, f. 4), is from a wooden model made by the Aleutians as a whale of their seas.

2. *Balaena japonica*, Lacépède, Mém. Mus. vol. iv. p. 473.

3. *Balaena lunulata*, Lacép. Mem. Mus. iv. p. 475.

These two are from Chinese or, rather, Japanese drawings.

4. *Balaena australis*, Temminck, Fauna Japonica, Taf. 28 & 29 (not Desmoulin's). *Balaena Sieboldii*, Gray, Ann. & Mag. Nat. Hist. 1864, vol. xiv. p. 349. From a model made by the Japanese in porcelain clay.

5. *Balaena japonica*, Gray, Zool. Erebus & Terror, p. 15, tab. 1*. f. 2. *Balaena alutiensis*, Meyer, Van Beneden (Bull. Acad. Belgique, xx. 1866, no. 14.) Both from the north-west-coast whalebone of commerce, which is quite distinct from the South-Sea whalebone, brought from the Cape.

6. *Balaena japonica*, Eschricht, Vid. Selsk. Skriva. ser. 5. vol. ix. 1, 1869. From the skeleton of the foetus of a whale caught on the coast of Kamtschatka.

7. *Balaena mysticetus*, Cope, Proc. Acad. N. S. Philad. 1869, pp. 17 & 35. The Bow-headed Whale, Scammon: American whalers. Behring's Straits.

These must include more than one species; and there can be no doubt of the next being distinct, for it is a *Scrag Whale*.

8. *Rhachionectes glaucus*, Cope, Proc. Acad. N. S. Philad. 1869, pp. 17 & 40, fig. 8. *Agaphelus glaucus*, Cope, ibid. 1868, p. 225. The Californian Grey Whale. St. Francisco.

Cope observes that a species of *Agaphelus* exists in the Kamtschatkan seas, according to Pallas, who, however, derived his information solely from models made by the Aleutian islanders; he called it *Balaena agamachschik*. Dr. Cope observes, "Dr. Gray, in his Catalogue of Whales, truly indicates it as a genus unknown to him" (see Proc. Acad. N. S. Philad. 1868, p. 226). Mr. Cope's account of this whale is very interesting; and there are several remains.

In this work the number of the species of the genus is limited to five—*Balaena mysticetus*, *B. biscayensis*, *B. japonicus*, *B. australis*, and *B. antipodarum*; but the authors believe there may exist another species that extends from the east side of the Cape of Good Hope to Australia. This theory evidently has had considerable influence in determining what species they should admit as distinct, and what they should regard as varieties. They ignore the existence of two species of whales at the

Cape, of two species which I have described as being found in Australia, and the existence of two well-established species which are found on the coast of New Zealand; to be sure, one of these (*Neobalaena marginata*), as if in opposition to M. Van Beneden's theory, instead of being found in a belt between Australia and the east coast of the Cape of Good Hope, is common to West Australia and New Zealand.

It is very curious that M. Van Beneden did not discover that my *Macleayius australiensis* is the Right Whale of Australia, which he regards as at present unknown, and at another place mentions that it may probably be *Neobalaena marginata*, which has whalebone only about two feet long, whereas the Black Whale of Australia has whalebone five or six times that length, or it would not be worth the whalers collecting for sale. M. Gervais erroneously states that this genus and species was founded on an error, caused by a photograph; but that is entirely a mistake, caused by the very carelessness in compiling to which I have before referred. It is very true that I did at first think that the genus *Macleayius* was peculiar for having the atlas free from the rest of the cervical bones; when I discovered the error of this opinion, and received additional photographs, I stated, "but still the form of the atlas is so distinct from any other known genus of Balænidæ, that I believe the Australian Right Whale will be a distinct genus, to which the name of *Macleayius* may be appropriately applied, and it is, no doubt, a true *Balaena*" (Gray, Cat. Seals and Whales, p. 371). M. Gervais further says, with regard to this whale, "Nous ne voyons pas de motif de ne pas rapporter cette région cervicale à la *Balaena antipodarum* en attendant que l'on ait des renseignements précis sur ses caractères distinctifs;" but I think that if any one will compare M. Gervais's figure of the cervical mass of *B. antipodarum*, given in pl. 3. figs. 4 & 5 of his work, with the figures of the cervical mass of the Australian whale figured in my Catalogue, p. 105. f. 10, 11, p. 372. f. 74, 75, he will find that little reliance can be placed on M. Gervais's remark. In the New-Zealand whale the upper lateral process of the atlas is narrow, like the same process in the Greenland and Mediterranean whales, while in the Australian whale this process is particularly high and wide; and the lower lateral processes are equally distinct and peculiar. And I think that the mass of cervical vertebrae dredged up at Lyme Regis, and figured in my 'Catalogue of Seals and Whales,' p. 83. f. 3, which M. Van Beneden refers to *B. biscayensis*, and at the same time says that it is so different from *B. mysticetus*, is the most nearly allied to the cervical vertebrae of the genus *Macleayius*, and

which I call *Macleayius britannicus* after the Mare Britannicum of the ancient geographers. I think I have proved that M. Van Beneden's theory of geographical distribution of whales is entirely unsupported by facts.

XVIII.—*Conclusion of the History of the Wasp and Rhipiphorus paradoxus, with Description and Figure of the Grub of the latter.* By ANDREW MURRAY, F.L.S.

[Plate XIV.]

WHEN I bade adieu to this subject some months ago, I did so with the promise that, if further investigations by myself or others should show that I was mistaken in the views I had taken up, I should readily and handsomely acknowledge my error.

I have now to redeem my promise; and notwithstanding the natural reluctance which every one feels to acknowledge that they have been mistaken, I make the acknowledgment with pleasure, because it enables me to do an act of justice to one, the accuracy of whose observations I had impugned, and to withdraw any doubt I had expressed as to their reliability. Not that I ever in the remotest degree felt or expressed any doubt as to the genuineness of his observations; but one may be a very truthful and yet a very inaccurate observer; and this was what I had supposed Mr. Stone to be, and what I am happy now to be able to say was a very unjust supposition. Another alleviation to the wound which my *amour propre* may be supposed to have received, is the satisfaction of having, as I think, cleared up if not all the unknown and doubtful points in the history of the insect, at least those which last year prevented the question of parasitism being brought to a definite conclusion.

Through the continued kindness of Miss Eleanor Ormerod I have this year been enabled to examine some combs well supplied with *Rhipiphori* at a less advanced stage than those which I studied last year, as well as to profit by her independent observations. Last year the *Rhipiphori* were mostly in the state of the perfect insect or chrysalis before I saw them; and I did not then know the larva. The one or two which I did see in the doubly tenanted cells which I described in my first paper on the subject, I mistook for immature pupæ; and when Mr. Smith showed me Mr. Stone's



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