Correspondence between

Albany Hancock (1806-1873)

and

Thomas Henry Huxley (1825-1895)

Spanning the years 1852-1873

Contents:

Hancock-Huxley Correspondence: Background

Albany Hancock was a naturalist, anatomist and zoologist; he was also a specialist in 'molluscs'. Towards the end of his life he also worked on fossil vertebrates.

Thomas Henry Huxley was also a naturalist, anatomist and zoologist. In terms of specialist groups, he had many, including 'molluscs', rotifers, cnidarians and vertebrates.

In the first half of the 19th Century, 'molluscs' included both today's molluscs and animals that are now included in the phyla Brachiopoda and Tunicata (Urochordata). It was partly through the work of these two men that this rearrangement into what we now think is the correct structure of the animal kingdom was made possible.

Most of the extensive correspondence between Hancock and Huxley concerned the 'molluscs' of the time – their general body form, their detailed anatomy, and their embryology.

The focus of the work was establishing the correct pattern of homologies. Our current interpretation of homology is that it is a pattern of similarity based on shared ancestry – for example the similar pattern of limb bones in humans, monkeys, bats and dogs indicates that their last common ancestor had limbs.

However, the Hancock-Huxley correspondence started before Darwin's publication of *The Origin of Species*. What homology meant back then is less clear than it is today. It could have been interpreted as reflecting a divine plan or as evidence for an evolutionary process, even though at that stage there was no agreed mechanism that drove evolution – later Darwin's natural selection was seen as this mechanism.

Huxley probably believed in evolution even before *The Origin*, and Hancock may have done too; but there is precious little in their correspondence that would back up this statement. They corresponded for more than 20 years, over a period straddling the advent of Darwinism, and yet neither of them mentioned Darwin once. Why this is the case is not at all clear; rather, it remains an enigma.

Taxonomic context

Since the work discussed in this correspondence is comparative anatomy and comparative embryology, it only makes sense against a taxonomic (and phylogenetic) background.

This background has changed over time, as our understanding of the structure of the animal kingdom has evolved. Below is a list of the main groups of what we now regard as molluscs; also a list of those other groups that were considered as 'molluscs' in the broader sense of that term which prevailed in the middle of the 19th Century.

The phylum Mollusca is usually now divided into seven classes:

Gastropoda (aquatic and terrestrial snails and slugs): about 85,000 species.

Bivalvia (bivalves including clams, cockles, mussels, oysters etc): about 10,000 species.

Cephalopoda (octopus, squid, cuttlefish, Nautilus): about 1000 species.

Polyplacophora (having multiple shell plates; chitons): about 1000 species.

Scaphopoda (tusk shells): about 500 species

Aplacophora (without a shell; wormlike): about 500 species

Monoplacophora (having a single 'primitive' shell plate): about 30 species

Note: The last two of these classes are probably not monophyletic and so may be abandoned in due course; however, Hancock and Huxley did not work on these. Most of their work involved the gastropods and cephalopods; also some involved bivalves.

Other animals that were regarded as molluscs, now reassigned to other phyla:

Phylum Tunicata (or Urochordata): sea squirts

Phylum Brachiopoda (lamp shells; superficially similar to bivalve molluscs)

Smaller taxonomic groups within these phyla and classes are listed at the end of this document, along with some vertebrate taxon names relevant to the final few letters.

Sources and codes

Letters from Hancock to Huxley are in the Imperial College Archive.

All letters in this collection are coded in the following form:

HP 17.000 AIC, where…

HP stands for Huxley Papers

17 refers to volume (all letters from Hancock are in volume 17)

000 refers to the sheet number on which the letter starts (these range from 250 to 330)

AIC stands for Archives of Imperial College

Note: Some numbered sheets have two pages of writing. Where this is the case, each page is referred to as L or R for left or right pages/columns.

Letters from Huxley to Hancock are in the Archive of the Natural History Society of Northumbria.

All letters in this collection are coded in the following form:

NEWHM: 2017.H64.00, where…

NEWHM stands for Newcastle Hancock Museum

2017 is the year of transcription

H64 is an identifier for the letters from Huxley to Hancock within transcription year 2017

00 refers to letter number (these range from 1 to 40)

Note: Each new page within a letter is indicated by a number in square brackets, e.g. [2]

In addition to the above codes, determined by the archival sources, each letter also has an HH code (Hancock-Huxley), with a number denoting the position of the letter in the combined correspondence of 72 (known) letters.

General information on the correspondence and its transcription

It is clear that some letters are missing, but these probably constitute only a small fraction of the total correspondence.

Almost all the letters that survive are complete. However, there are a few exceptions. These are noted in the transcriptions of the letters concerned.

A few letters contain diagrams. These diagrams are not reproduced here.

Throughout the correspondence, there are scattered words that are difficult or impossible to read. When there is a probable interpretation, this is given, with a question mark in square brackets attached to the word concerned, without a space between the two. When there is no obvious interpretation, a question mark in square brackets (with spaces on either side of the brackets) is given. When two words are inscrutable, the insert is [??], and when three *or more* words are inscrutable, the insert is [???].

A brief summary is given for all letters whose transcription runs to more than one page of this document. For the shortest letters, there is no summary.

In the case of one letter (4 May 1852, Huxley to Hancock), there is an accompanying document that is not a letter. This includes an extensive translation of published work in German by the Swiss biologist Albert von Kölliker.

All of the taxa that are referred to by Hancock and Huxley are listed at the end of the correspondence. For genera, the higher taxa to which they belong are given, together with a note of the relevant common name(s). For higher taxa, some brief information is given. Note that in all cases involving molluscs the taxa in these lists can be connected with the main groups of molluscs given as an overview on page 3.

HP 17.250 AIC

Albany Hancock to Tomas Henry Huxley, 11 April 1852 HH1

SUMMARY

Hancock asks Huxley for information on the Swiss biologist Kölliker's paper (published in German) on the embryology of the cuttlefish Sepia. He expresses the view that cephalopods (cuttlefish, squid, octopus, nautilus) are true molluscs, perhaps most closely related to the gastropods (snails).

TRANSCRIPTION

[250]

St Mary's Terrace – Newcastle on Tyne | 11th April 1852

Dear Sir

I take the liberty of writing to you prompted by the suggestion of Mr Woodward from whom I learn that you have kindly expressed your willingness to assist me to some information extracted from Kölliker's paper on the development of Sepia.

I have recently dissected Ommastrephes sagittatus and have arrived at the conclusion that the Cephalopoda are true Mollusks formed more immediately on the gasteropodous type, and am therefore anxious to ascertain if any thing in connexion with their embryology contradicts this opinion. –

[251 L]

In Owen's lectures I find the embryo of Sepia figured. In this figure the intestine is doubled upon itself in the direction of the side on which the funnel is placed, and the yolk is absorbed from the same side. This accords very well with my notions, for I take the funnel to be the cephalic veil; Consequently it is attached to the dorsal region. The sleeve I believe to be the homologue of the foot, and the membrane closely investing the [?] the mantle. This membrane is therefore most probably extended, over the yolk, and the sleeve partly over it.

Mr Woodward was so good as to send me tracings from some of Kölliker's figures; but I find

[251 R]

much difficulty in understanding them, as they are unaccompanied by any explanations. I should like to know if Kölliker confesses[?] Owen's figure and if there be any thing in his paper to throw light on the true nature of the Cephalopods.

If you can give me any information on these points, without much inconvenience to yourself I shall be greatly obliged, though I must confess that I feel great diffidence in asking you to take so much trouble on my account; particularly as I have not had the pleasure of your acquaintance – Trusting, however, that you will pardon my obtrusion I am,

Dear Sir | Yours respectfully | Albany Hancock

NEWHM: 2017.H64.1

Thomas Henry Huxley to Albany Hancock, 15 April 1852 HH2

SUMMARY

This is just a short polite reply to indicate that he can't answer Hancock's letter properly yet because of a 'calamity' which, though Huxley doesn't say so, was the death of his mother.

TRANSCRIPTION

41 North Bank, Regents Park

April 15 1852

My dear Sir

It gave me real pleasure to make your acquaintance – though only by letter – and still more to find that I could be of any service to you.

I was about preparing an account of those facts of Kőlliker's statement which

[p2]

bear upon the questions you mentioned – but the occurrence of a sudden dramatic calamity – has I am sorry to say – for the present interrupted all my occupations.

I trust, however, to be able to resume them very soon – and I shall then be very glad to furnish you with all the information I can where this question, which is one of very real interest to me – Indeed I

[p3]

not long ago sent in a memoir to the Royal Society – upon the "Homologies of the Cephalous Mollusca" in which it was discussed. [This sentence is a bit garbled]

Pray accept this as an apology for any delay that may occur in properly answering your letter

& believe me | Very faithfully yours |T.H. Huxley | [To] Albany Hancock Esq

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NEWHM: 2017.H64.2

Thomas Henry Huxley to Albany Hancock, 4 May 1852 HH3

SUMMARY

Huxley is sending Hancock (herewith; see note 1) an abstract of work done by Kölliker on the embryology of Sepia (cuttlefish), plus his own interpretation of various features of the anatomy of the 'cephalous molluscs' (roughly speaking, Gastropoda and Cephalopoda). He also mentions that he has read Hancock's paper on the sea-slug Doris. He admires the paper but disagrees with some of Hancock's interpretations. Huxley also mentions relevant work by Keber.

TRANSCRIPTION

41 North Bank

Regents Park

May 4th 1852

My dear Sir

I am quite ashamed to see how long a period has elapsed since your letter reached me – But what between the complete interruption produced by the death of a very near relation – and the fuss

[p2]

of occupation consequent upon – having to deliver a lecture at the Royal Institution last Friday – I have been quite unable hitherto to fulfil my promise.

I send you a short abstract[1] of Kölliker's researches upon Sepia, which will I hope will be intelligible – (any further enquiries I shall be very happy to answer) and in addition – I thought it would be of interest to you

[p3]

to explain my own views on these matters – which have been explained at length and with, I hope, full evidence in a paper now before the Royal Society.

I should be very glad to have your opinion about them.

I have lately had an opportunity of making close acquaintance with your paper on Doris [sea-slug] – and (though I do not quite agree with your views upon the nervous system) – you must allow me to confess my great admiration of the manner in which you have worked the subject out.

[p4]

You will be interested to learn that a Dr Keber – in a paper on the anatomy of the freshwater [?] published in 1851 – has described a system of vessels that communicates with the pericardium – which seems to me to be the homologue of your "portal" vessels – If you think it worthwhile to examine into the matter for yourself I shall be very glad to give you further information about the German Doctor's discoveries

I am| My dear Sir |faithfully yours| T.H. Huxley| [To] Albany Hancock

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Note 1: The 'abstract' referred to by Huxley corresponds to an 8-page handwritten document with hand-drawn illustrations/diagrams, which Huxley has produced himself based on the research work of Kollicker, which is published in German, which Huxley can read but Hancock cannot. This document has been located but it was not together with the letter. The transcription of the document, and confirmation that it goes with this letter, have now been completed. The transcription is below.

Translation of work by Kölliker, plus THH's views – sent to AH with letter of 4 May 1852

TRANSCRIPTION[1]

The ovum of the Cephalopod undergoes a partial division of the yolk –

In consequence of this process a germinal membrane or germinal area is formed at one pole of the egg.

The earliest stage of the embryo's appearance upon the germinal membrane (in Sepia) –

[**Diagram 1a** is here at the RH side of the page]

In the centre an oval or oval-rhombic elevation – the future *mantle* – anterior to and at each side of this two vermiform elevations the rudiments of the eyes – (these therefore indicate the position of the head: -)

and on the sides of the mantle two elongated elevations which will become the funnel

The gills make their appearance as two small elevations, behind the mantle, and within the posterior curve of the funnel

In a further stage – the head consists of two lobes – which lie laterally to the funnel – the eyes lie upon the anterior of these lobes – the mouth has appeared in front of the mantle –

[**Diagram 1b** at RHS here]

At the margins of the germinal membrane the *arms* arise commencing with the posterior pair – as small rounded processes on which at first no suckers are visible

In a yet further stage – (the embryo all the while becoming more raised up) the lobes of the

[p2]

head have become still more marked - : the two halves of the funnel have united anteriorly – the point of union forming an elevation in which the shell is eventually formed –

The anus appears behind the mantle between the posterior curves of the funnel –

[**Diagram 2** at RHS]

Now here is the certain foundation of the Cephalopod – but sketched out – as it were, & essentially a gasteropod

[**Diagram 3** on RHS]

The whole further changes assist eventually in the pinching up, as one might say, of the body in a vertical direction – with an excessive development of the mantle and of the foot (- represented as I

think it is very obviously here by the arms and the substratum of the germinal membrane from which they arise -)

In this figure of a further advanced embryo – for instance the mantle has become larger in proportion: it has covered the arms - & begins to cover in the gills & funnel –

The whole of the central part of the embryo has

[p3]

been raised up from the general level of the germinal membrane, and the head lobes are beginning to meet posteriorly & to be likewise raised up –

As a consequence of this movement the arms are brought close together – and by a continued action of the same process the anterior arms eventually meet in front of the mouth, and give it its eventual central position –

As Kölliker observes –

"If we keep steady in our minds the fact that the germ, at first disk-like in shape - ; becomes gradually changed into the bell-shaped embryo – we shall readily comprehend all the changes in position of the organs of the embryo – especially those which relate to the approximation of the arms; - lobes of the head - : halves of the funnel, gills - : mouth & anus - - ;" –

The folding of the intestine is similarly a consequence of this mode of development of the embryo

Suppose a line is to be drawn through fig 5 from mouth to anus – it will represent the position of the intestine – [which] however does not yet seem according to K[olliker] to be developed

[p4]

It is very easy to understand how in fig 4 – the intestine has partaken in the general elevation of the centre of the germ & has become bent upon itself

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This is the pith of Kölliker's arguments but he does not himself give them full force or indicate their bearing on the homologies of the Mollusca –

Now this is what I have endeavoured to do in the paper on the "Homologies of the Cephalous Mollusca" which I sent some time back to the Royal Society – Ever since I first read Kölliker's paper five years ago I have had nearly the same opinions; and I have been collecting evidence – anatomical & embryological – until now I hope I have given my views the force of demonstration –

I have endeavoured to show that all Cephalous Mollusks from the Cephalopod to the nudibranch – are organized upon one typical form and arise in consequence of modifications of that form according to definite laws –

This Hypothetical Type I call the Archetype of molluscous forms – Perhaps Chitons would more nearly represent it than any [other] actual form –

[p5, new sheet]

[**Diagram 5** occupies the top quarter of p5, extending right across page]

Suppose the above [refers to diagram] to be this archetypal mollusc – I call the whole region coloured red – the *Haemal* region, that coloured blue the *Neural* region – the latter consists of head & foot –

The foot is divided into three portions – the *pro- meso-* & *meta podium*.

A curved line which is marked yellow I call the *epipodial* line – and processes which are developed in the different classes of molluscs along part, or the whole of its length – the *Epipodium* –

Now it seems to me that the Cephalous Mollusca are divided into two great series according as the symmetry of this archetypal embryonic form is disturbed in one or other of two ways –

In the first of these series – a particular portion of the Haemal surface – in *front* of the anus – is developed in excess – the integument covering it is then called the "mantle" – I propose to call the [?] developed portion – an *abdomen*

[p6]

In the second series, a portion of the haemal surface behind the anus becomes overdeveloped and invested with a distinct "mantle" – I propose to call it a *post-abdomen*

In either series – the amount of flexure of the intestine – and the disturbances of the original position of the head – depend upon the extent to which the abdomen or post-abdomen is developed – the other varieties of form depend upon the greater or less development of different parts of the foot

Molluscks which develop an abdomen, are:

Cephalopoda, Pteropoda, & Pulmonata – as a consequence – the intestine is in all these bent towards the neural side –

In Cephalopoda – the extent to which the abdomen is developed is so great – that the intestine is sharply bent upon itself – and – animal becomes Prosobranchiate – i.e. the gills are in front of the head – at the same time the foot – becomes thrust out into processes at its edges – which are the arms – and the propodium over-arches the mouth –

The Epipodium – becomes the funnel

In Pteropoda the development of the abdomen sometimes involves the heart – as in certain Cleodora (Prosobranch) or leaves it

[p7, new sheet]

unaltered in position (Opisthobranch) as in [?] & other Cleodora – the parts of the foot are very variously developed – all seem to be present in [?] where the propodium arches over the head as in Cephalopods

In Cleodora – the mesopodium & metapodium are rudimentary & the propodium appears to be absent -

The [?] represent the epipodium.

In the Pulmonata – the abdomen is very variously developed (Helix, Limax) - & the head [?] alters its position – The parts of the foot form a single disk - & the Epipodium exists in the embryonic state only – as the so called yolk-sac

The series which develops a post abdomen includes – Heteropoda, Pectinobranchiata, Nudibranchiata – i.e. the other Cephalous Mollusks

The intestine is bent towards the haemal side – The variation in the extent of the flexure & in the position of the head are determined by the development of the post abdomen –

In Atlanta & Pterocecum the different parts of the foot – are well developed & distinct – in most of the others they are indistinct – In [?] the mesopodium is absent & the metapodium rudimentary

In [?] there would seem to be no foot at all.

The epipodium is in most rudimentary & exists only in embryonic life as the 'velum' – but in Aplysia – it remains as the great wings – & in [?] as the lateral palettes – In [?], it forms almost a funnel.

[p8]

[More than three-quarters of this page is taken up by **diagrams**]

I ought to apologize for the roughness of these sketches but I trust to your profound knowledge of the Mollusks for their intelligibility – when compared with the "Archetype" – all the secondary deviations of the intestine right & left are of course readily understood when the main ones are once comprehended.

Note 1: There seems to be a mix-up of page numbers and diagram numbers in this document. The total number of pages is 8. The total number of diagrams is unclear as some appear in pairs or groups and it looks like THH regarded the first two as 1a and 1b though they are not labelled as such. Pages are numbered 1, 3, 5, and 7. Diagrams are labelled x, x, 2, 3, 4, 5, x; where x indicates that THH gave no number. Confusingly, the number 7, used to indicate page 7, is actually on page 8 and beside the diagram that should be number 6. I have used 1a, 1b and 6 for the x, x, and x. Just to confuse matters further, the number 5 appears at the top of the 5th page and beside diagram 5, so it's not clear if THH was using it as a page number, a diagram number, or both; in any event, it works as both

HP 17.252 AIC

Albany Hancock to Thomas Henry Huxley, 16 May 1852 HH4

SUMMARY

Hancock indicates his disagreement with Huxley's interpretation of the anatomy of cephalopods, and how their structure relates to that of gastropods. The disagreement is partly to do with the overall orientation of the two types of molluscs, and partly to do with interpretation of the nervous system.

TRANSCRIPTION

[252]

St Mary's Terrace – Newcastle on Tyne

16th May 1852

My dear Sir

I owe you many thanks for all the trouble you have taken to place within my reach the results of Kölliker's researches on the development of Sepia, and also for the abstract of your own memoir on the homologies of the cephalous molluscs – a matter of much interest to me; as I have just sent to the Annals a paper on the homologies of the cephalopods. It is however with regret that I observe that our views are so discordant at least so far as the latter animals are concerned. You appear to base your deductions principally on the development of Sepia. However, I have taken mine, for the most part, from a comparison of the nervous system with that of the Gasteropods; it would therefore have been very gratifying had our conclusions agreed. As it is one of us must be wrong – As far as I can understand the development

[253 L]

of Sepia it does not appear to set the matter to rest, indeed it seems very anomalous – First of all how is the germinal membrane and arms determined to represent the front of the Gasteropod? This determination, on which so much depends, is certainly only analogical, and consequently not of much value. In this I may be wrong, but so far as I am acquainted with the embryology of the molluscs there is nothing to warrant this opinion. You may nevertheless be in possession of information on this subject with which I am unacquainted. As a general law, the foot and ciliated organs about the head first make their appearance in the Cephalous embryo. I should therefore have taken what you call the mantle for the foot of the Cephalopod; it is this organ which is amongst the first seen in the development of Sepia and I think it cannot be the mantle which is never developed at so early a stage. Now so far as the nervous system can

[253 R]

be brought to bear it is opposed to your views, – that is provided I have arrived at a correct interpretation of it. My first endeavour was to ascertain the cerebroid ganglions. These ganglions in the gasteropods are situated above the others and are united over the oesophagus by a commissure and

moreover communicate with the buccal ganglions and supply nerves to the organs of sense and also to the channel of the mouth and lips. Such ganglions are situated *below* the oesophagus according to authors in Ommastrephes. I therefore turn the animal over and leave it with the funnel uppermost, and this region I call dorsal. These ganglions in the Cephalopod communicate with the optic ganglions which are below the alimentary tube, and also with the buccal ganglions; they likewise give off the auditory nerves, the nerves to the funnel and those supplying the arms. The arms I therefore conclude

[254 L]

are developments of the lips or of the walls of the oral channel, and the funnel I take to represent the oral tentacles or cephalic veil. The optic ganglions, generally considered as a sort of brain, cannot represent the cerebral ganglions for they give off only the optic nerves – The cerebroid ganglions have attached to them two branchial and one visceral ganglions, which may well accord with similar ganglions in the gasteropods. The stellated ganglions of authors, - those situated in the sleeve, to which they distribute their nerves, are the pedal; and like those ganglions in the gasteropods they are united by a commissure below the oesophagus and likewise intercommunicate with the branchial ganglions. I have consequently no hesitation in pronouncing the sleeve to be the foot. In this way I find in Ommastrephes the equivalents of all the cephalic ganglions of the gasteropods. –

With regard to external form

[254 R]

I have used for comparison Gasteroptera. If the sleeve and funnel of the cuttlefish be laid open and the animal placed with what is usually called its back downwards, the resemblance of the two is very remarkable. The cephalic veil over-lies the head in both, - in both the visceral mass lies upon a muscular disc – the foot in one – the sleeve in the other; and this sleeve and foot are firmly united to the under side of the visceral mass in front. The visceral mass is in both enveloped by a delicate membrane, the mantle, and below this in both is found a peritoneal membrane. And we now see the heart and gills, as well as the olfactory orifices, assume their usual dorsal position. -

The so called mantle or sleeve of the Cephalopod does *not* agree with the mantle of Cleodora. In this latter animal the mantle has below it a peritoneum – in the Cuttle-fish there

[255 L]

is first of all a peritoneum, then a mouth, and then the sleeve, which is not formed by a fold of the mantle as generally assumed any more than the foot is in Gasteroptera, - the sleeve having the same relationship to the mantle as the foot has to the mantle of this Gasteropod. –

I don’t know whether I ought to apologise for speaking so freely on this subject, but my object is to explain to you the processes which have led to me adopting conclusions so much at variance with those entertained by yourself. And I trust that you will with as little reserve give me your opinion on these matters now since I have explained my views so far as can be done in a letter. And allow me to say that however it may be with regard to the Cephalopods your paper will undoubtedly be hailed as a most important contribution affecting our knowledge of the Cephalous Mollusks.

[255 R]

I should like to know if you have examined the nervous system of the Cephalopods and how you explain it? And also have you determined that the germinal membrane and arms are homologous with the foot? [?], of course, does not settle this and the embryology I think does not. -

We agree in one important particular, namely that the Cephalopods are true Mollusks: it was in this respect that I was so anxious to know what Kölliker had done, for if it could be shown that these animals are not true Molluscs then any determinations respecting the ganglions might be mere analogies, and consequently of no importance in tracing the nature of the various organs. As it is I deem the nervous element of the greatest value for this purpose.

I feel much gratified by your approval of our paper on Doris, and would be glad to know in what

[256 L]

respect you differ from our views upon the homologies of the nervous system – I thought what we had said on this part of the subject was much in accordance with received opinions, at least with one or two exceptions –

It gives me much pleasure to hear of Dr Keber's discovery. I have no doubt a portal system will be found in nearly all the Mollusca. I think such a system exists in the Cephalopods having examined with care the "fleshy" appendages attached to the branchial hearts and found that they are really ventricles communicating with the interior of these hearts. They will therefore propel venous blood. Unfortunately my specimens were torn at this part, or I have no doubt that I should have traced vessels leading from these ventricles to the liver. It is a matter that can be easily determined should a perfect specimen turn up. Though

[256 R]

it would give me much pleasure to know something more of Keber's discovery I cannot think of troubling you respecting this matter; at the same time I may express a wish that you would, at your leisure give us an abstract of this the paper in the Annals; you have maintained that you thought of doing so with regard to Kölliker's memoir; and certainly you would render great service to British naturalists if you would from time to time publish translations of valuable German works such as these.

I must now conclude, again thanking you for your long and interesting communication. -

I remain, my dear Sir | Yours truly | Albany Hancock | [To] T.H. Huxley Esq

NEWHM: 2017.H64.3

Thomas Henry Huxley to Albany Hancock, 24 May 1852 HH5

SUMMARY

In this letter Huxley reiterates his different interpretation to Hancock of the relationship between gastropod and cephalopod structures; and gives reasons why he still prefers his own view. Most of the material covered is to do with the nervous system and embryology.

TRANSCRIPTION

41 North Bank, Regents Park

May 24th 1852

My dear Sir

I was very pleased to receive your frank & clear statement of your views – although I confess they startled me no little – much as I admired the ingenuity of them. I have turned these over in my mind very carefully, and you must not think me too obstinate if I say that I still adhere to my own interpretation and that difficulties which seem to me altogether insuperable suggest themselves of yours –

You base your conclusions mainly upon the anatomy of the nervous system – I have not examined Ommastrephes - : but so far as I have seen in Sepia & Loligo – and so far as the accounts of authors go with regard to other Cephalopods – there is nothing to interfere & everything to agree with my views – although the infra-oesophageal (in my sense) ganglia do communicate with the buccal ganglia – these receive their principal cords from the supra-oesophageal mass

[p2]

from which the optic nerves also are off –

The attachment of the auditory vesicles again, to the infra oesophageal ganglia – corresponds exactly with their position in almost all Gasteropods and in Acephala, if the ganglia to which they are connected are to be considered as pedal – not otherwise.

Take an authority to whom we shall both defer – Prof Owen - ; and examine his account of the nervous systems of Sepia and Nautilus (Lectures on Invertebrata) and compare it with Aplysia or Patella or any ordinary Pectinobranchiate Gasteropod - ; we find ganglion arrives to ganglion exactly – In each the supra oesophageal mass gives off nerves to the buccal mass & ganglia – and optic nerves -: The supra oesophageal masses give off nerves to the auditory organs – to the foot or arms and to the mantle –

Nautilus is especially instructive – for the stellate ganglia are absent – and therefore something else must be sought for as the representation of the pedal ganglia – which are always the very last to disappear

[p3]

However, apart from the nervous system there is I think one great difficulty in the way of your view of which you make no mention – If the sleeve be the representation of the foot what business has it with a shell in Sepia, Nautilus, etc?

The extreme supposition of considering the cephalopod shell as an operculum will not do because – (adopting your view) the shell lies in the wrong part of the foot to be an operculum in Sepia and is formed on the wrong surface in Nautilus –

There is another strong point against your view to be derived from the position of the tongue & [?] plate in Cephalopods – If we adopt your view this must be supposed to descend from the *roof* of the buccal cavity, instead of projecting from its *floor* as it does in all other molluscs –

If your mode of comparing Gasteroptera and Ommastrephes be adopted – the difficulty remains that the position of the tongue and of the auditory ganglia is the reverse in one of what it is in the other –

The difference between the mantle of Cleodora & the sleeve of the Cephalopod upon which you insist appears to me to arise from the more definite

[p4]

arrangement of the muscular fibres of the mantle in the latter case –

Nautilus has posteriorly, its mantle as delicate as that of a Gasteropod anteriorly it gradually becomes the muscular sleeve of a Cephalopod

Having now made my onslaught upon you I must turn and defend myself.

Upon purely embryological grounds the homology of the arms of the Cephalopod with the foot – appears to me to be a consequence of admitting that the first formed part of the embryo is the mantle –

That the first formed part of the embryo is the mantle appears to me to be established 1. by its containing or developing the shell – if any is formed – 2. by its relations to the organs of respiration and circulation 3. by the fact that in Gasteropoda it is always the mantle side which is developed first–

The first consideration I have already referred to – As regards the second – Look at Kőlliker's figures of the young embryo while still flat & when the gills have begun to form – It is clear from this that the disputable organ (a) is on the same side of the body as the gills – and therefore on the same side as the heart – which in all molluscs is dorsal and never on the foot-side –

[the (a) seems to refer to an inscrutable scribbled diagram in the margin here]

[p5, new sheet. Begins with a 3. This refers back to the 3 above on previous sheet]

3. I have had no opportunity of carefully working out the development of Gasteropod Molluscs myself – but Vogt in his account of the Development of Acteon – Nordmann & Shulze in that of

[?taxon] – Gegenbaur in that of the Pulmonata & Van [?] on the same – supply abundant & careful evidence that in the Gasteropods development commences upon the mantle side –

Vogt's beautiful & careful paper on the development of Acteon in the Annales des Sciences for 1846 is especially worthy of your study in this respect – and is especially adapted to answer your query "how do you determine that the germinal membrane & arms are homologous with the foot?" – Making allowance for the difference in the relative positions of the yolk and the embryo – the former being very large in the Cephalopod & very small in the Gasteropod – the first stages of embryonic development are absolutely the same in the two cases –

I have sketched here two imaginary sections of the embryos of Acteon & Sepia. The foot of Acteon is formed by the union of the edges of the germinal membrane – the mouth being developed from the centre of the same membrane –

[On same sheet as above there is a poor-quality drawing]

[p6]

There is one source of fallacy to be noted – It is commonly said that the foot & ciliated lobe are the first formed parts in the Gasteropod embryo – This is not quite correct – they are the first *obviously distinguished* parts – but the first *formed* part – the centre of the gl. membrane – is that which becomes the mantle – or dorsal surface –

I hope I have now made the grounds of my ideas intelligible to you – I wish it was possible that we could have some talk over the matter – A clear conception of the archetypal form & morphological laws of the Mollusca – and a proper distribution of the Radiata, as it seems to me, the two great things wanted in Invertebrate Zoology at present – I am greatly interested in both –

I include with this the abstract of a lecture I gave some time ago – to the great obfuscation of my audience – upon "Animal Individuality" in its bearing upon the alternative theories [?] – and beg your acceptance of it – though I do not know whether you take interest in such speculations and if you will allow me I will send in another post one or two Zoological papers of mine from the Philosophical Transactions [?, probably 'etcetera']

I am | My dear Sir | Faithfully yours |T.H. Huxley | [To] A. Hancock Esq

HP 17.257 AIC

Albany Hancock to Thomas Henry Huxley, 4 June 1852 HH6

SUMMARY

This is another instalment in the argument between the two men over how to interpret the structures of different kinds of mollusc – gastropods and cephalopods – in terms of homology. Here, Hancock reiterates his belief in his own views and tells Huxley that the latter's views are contradicted by anatomy – both general anatomy and anatomy of the nervous system in particular. It's nicely done: firm, and at some length, but not confrontational.

TRANSCRIPTION

[257]

June 4th 1852 – St Mary's Terrace

My dear Sir

Accept my best thanks for the memoirs which you were so good as to send me. I am very glad to possess them, particularly that on Salpa, and have no doubt that I shall derive much information from them. I send you by way of acknowledgement two or three papers of my own which I hope you will do me kindness to accept.

I have read with much attention your letter, and strange as it may appear to you I must disclose that I do not see the force of your arguments. In my estimation neither the embryology, nor the anatomy of the nervous system, nor the general anatomy, warrants the conclusions at which you have arrived. I am heartily sorry that we cannot agree on this subject; and fully feeling my inability to discuss so complicated a matter in a letter I fear that I shall not succeed to make myself clearly understood by you; I will however do my best in replying to the more salient points raised in your letter.

I am acquainted with two or three of the papers which you refer me to on the embryology of the Mollusca. Vogt's I have known for some time and having myself examined the development of the nudibranchs I can vouch for the general accuracy of his excellent work. I think that I now understand your views respecting this

[258 L]

part of the subject but it seems to me that due caution must forbid the adoption of them.

The development of Sepia is so different from that of Acteon that any rigid comparison between the two is likely to result in error. In one the yolk is apparently gradually absorbed from without as in the higher animals; in the other it is at once enclosed. Now this is such an important deviation from the usual plan that one might almost doubt the true molluscan nature of this animal. And moreover it causes such a dissimilarity in the forms of the embryos as to prevent the exact determination of the parts, and when the enormous development of the head of Sepia is taken into account the difficulty is so much enhanced as to make the attempt indeed a bold one. If under such circumstances the

comparison is to be made the [?] appearance of the parts is undoubtedly the best test. According to Vogt the yolk is in the first instance enveloped by an external layer or germinal membrane. From this layer the head and parts about the head, the foot and the mantle are developed; so are the same parts developed from the germinal membrane of Sepia. At first the external layer or germinal membrane is neither mantle, head nor foot; a change is required to form it into the organs of the embryo and the first changes perceived are those which result in the ciliated lobes and foot: the shell and mantle are not observed until after the appearance of the otoliths. This is clearly established by Vogt. The first formed parts from the germinal membrane in Sepia are those about the head and the so called mantle. I think

[258 R]

therefore that there can be little doubt that this latter organ is really the homologue of the foot of the gasteropod. What I contend for is that no mantle can be observed until after the parts about the head and the foot have made their appearance, and, as there is no reason to doubt that the same law holds good with the Cephalopods, this is sufficient for our purpose. The relations of the organs of respiration & circulation to the mantle cannot be set up against observation to prove that the mantle is the first organ developed. Before this can be allowed it is necessary to meet by counter observations those of Vogt and others. It does not consequently follow that because the germinal membrane is first formed on the mantle side the mantle itself is the first developed organ.

With regard to the nervous system Nautilus is undoubtedly instructive, and I have made much use of it in my paper [?] as you must deem it. Prof Owen like all great as well as small men may sometimes commit errors. Therefore [?] great [?] his authority – and no one can be more ready than I am to admit its greatness, we must allow ourselves occasionally to question it. I have consequently freely compared the anatomy of Nautilus with that of the gasteropods and find that the surface called dorsal by Owen is really ventral. The supra-oesophageal mass or cerebroid ganglions of the gasteropods do not give off nerves to the buccal organ as you infer. The anterior nerves from these centres go to the channel of the mouth in part of the buccal organ, to the lips, and to the oral tentacles. The buccal ganglions alone supply the buccal organ, tongue and parts immediately about the buccal organ. Now if we refer

[259 L]

to Owen's memoir on the pearly nautilus we find that the supra-oesophageal mass according to this authority, or as the Prof calls it "the brain or general commissure" gives off four pairs of nerves which "supply the parts immediately surrounding the mouth, the muscles of the jaws and the tongue". There can therefore be no doubt that this "commissure or brain" is really the buccal ganglions; and as these are always *below* the oesophagus we must reserve the position assigned by Owen to Nautilus if we have to compare it with the gasteropods. All the other ganglions may move or keep their positions; the buccal ganglions alone never may in this respect; they are consequently the best test to determine the dorsal and ventral aspects of the Mollusca – The otoliths being occasionally appended to the cerebroids and occasionally to the pedal ganglions can not determine these points; though I was not aware that they are so universally attached to the pedal in the gasteropods as you infer. In the nudibranchs as far as I have seen they always belong to the cerebroids; and according to Souleyet they are likewise appended to the same ganglions in the Heteropods. In the Acephala the otoliths were found attached to the labial ganglions by Seibald; and these ganglions are certainly homologous with the cerebroids. Neither was I aware that the otoliths had been determined in Gasteroptera; Souleyet has not described them and though I have dissected the animal I have not yet sought for these –

Having ascertained that the so called brain mass of Nautilus is really the buccal ganglions, it follows that one of the infra-oesophageal masses must be the cerebroids.

[259 R]

As we know that these latter ganglions supply the channel of the mouth, the lips with their appendages, the olfactory organs, and are likewise in connexion with the optic and buccal ganglions and occasionally with the otoliths we can look only to the anterior infra-oesophageal to answer to the cerebroids of the gasteropods. The posterior infra-oesophageal correspond to the branchial and visceral ganglions; and thus it is very easy to show how completely the ganglions of Nautilus agree with those of the gasteropods with the exception of the pedal which are yet to be sought for in Nautilus. They may not exist at all or only in a rudimentary state. In the Acephala the pedal ganglions are entirely wanting when the foot is not developed; and as it appears to me that Nautilus is unprovided with this organ, or has only the rudiment of it the pedal ganglions are probably deficient or nearly so.

You ask if the sleeve be the representative of the foot what business has it with a shell, in Sepia, Nautilus etc? Now My dear Sir it might be time enough to answer this question when you have replied to the following. Adopting your views for the moment, - what business has the foot of Argonauta with a shell – we know that the foot of the gasteropods does secrete a shell, it would therefore be absurd to deny the same privilege to the foot of the Cephalopod. The shell of Ommastrephes does not appear to me to lie in the wrong part so as to preclude its comparison with the operculum; yet it is quite unnecessary to insist on the homology of the two. – The shell of Nautilus is not, according to my views, formed by the foot at all. The sleeve is not the homologue of the mantle of Nautilus; the mantle of Nautilus is undoubtedly a true

[260 L]

mantle, and consequently the shell it secretes is equivalent to the shell of the gasteropod,– not to the operculum. –

The objection you take respecting the position of the tongue is the only one that I admit to be of much importance. My explanation of this is that the Cephalopod living entirely in a reversed position the tongue is developed from the upper instead of the lower side of the mouth that its relationship to the food should be the same as in all gasteropods – that is that it should act against the gravity of the food – And it seems more consistent to allow of this simple deviation from the general plan than to adopt a theory which necessitates the alteration of almost the whole anatomy. And again, if we adopt your views, the habits of the Cephalopods equally contradict a general law. All oceanic molluscs swim inverted, and this they must do on account of the fundamental arrangement of their organs, - on account of the position of the centre of gravity: and there appears no reason to suppose that the Cephalopods are an exception to this rule. All oceanic Mollusks, except the Cephalopods, have the means of fixing themselves by the ventral surface; the lingual apparatus when taking food may therefore be supposed to act in the usual way – hence there is no necessity for a change in its position in the greater number of these animals. And it must not be forgotten that the buccal organ is of a very abnormal character: the altered position of the jaws may of itself perhaps necessitate a change in the position of the tongue –

With regard to the mantle of Cleodora and the sleeve of the Cuttle-fish all I can say is that anatomy

[260 R]

contradicts your explanation of the matter. –

The mantle of Nautilus is formed by a fold of the skin exactly as in the Gasteropods; its anatomical relationship is therefore totally different from that of the sleeve of the cuttle-fish –

In conclusion I have only to comment that I cannot adopt a theory, however ingenious which seems to me, at present, to be contradicted by the general anatomy and more particularly by that of the nervous system. Embryology I consider has not yet fully spoken out; we must know something of the embryology of Nautilus before instituting close comparison between the development of the Cephalopods and Gasteropods – and even then the difficulties may be insurmountable. -

I hope that you will pardon the length of this epistle, and the freedom of its style, and allow me to remain

My dear Sir |Yours truly | Albany Hancock | [To] T. H. Huxley Esq.

NEWHM: 2017.H64.4

Thomas Henry Huxley to Albany Hancock, 7 June 1852 HH7

SUMMARY

Here Huxley reiterates his confidence in his own views about the homologies of various structures between gastropods and cephalopods, with especial reference to the nervous system. Interestingly, Huxley includes a jibe at Richard Owen, a man considered by most biologists at the time to be an almost infallible authority but who Huxley saw through (and fell out with). This bringing of Owen down to Earth by Huxley may have been instrumental in persuading Hancock to accept Huxley's views of molluscan homologies (see next letter from Hancock, dated 28 June 1852).

TRANSCRIPTION

41 North Bank, Regents Park

June 7th 1852

My dear Sir –

I trust that your eyes will be in good condition when you receive this for I feel moved to write you a screed of no ordinary dimensions, and I know by experience what it is to have to read any amount of my calligraphy –

The really important differences between us are it seems to me upon matters of fact which any one can determine for himself – the matters of interpretation depend upon the matters of fact more or less closely –

Thus as regards the nervous system – I was perfectly aware that the nerves of the buccal organ came off from the buccal ganglia – *Directly* – but inasmuch as in every mollusc I ever dissected or read of the buccal ganglia are placed at the ends of trunks which come from the cerebroid ganglia

[p2]

– I look upon the buccal nerves as cerebroid nerves just as one looks upon the 1st division of the 5th as a cerebroid nerve – though as everybody knows that comes *direct* from the [?] Ganglion & only indirectly from the brain

I have dissected the nervous system in Gasteropoda & Heteropoda with especial care and I can affirm that in all cases, the buccal ganglia are placed upon trunks which are all connected with the cerebroid ganglia, and those only –

The same buccal ganglia are as you justly observe always below the oesophagus – at the re-entering angle between the oesophagus & the buccal mass, where the latter is well developed; - and such is their place in Argonauta – Octopus & Sepia

Prof Owen has I believe simply missed them in Nautilus – In fact in his lectures p 320 you will find the omission quietly corrected – I dare say from Valenciennes[?] –

In the Cephalopoda there appear to be ganglions or a ganglion *beneath* the buccal mass – which are connected with the pedal ganglion (I use the ordinary nomenclature for clearness sake) –

[p3]

If your interpretation of the supra-oesophageal mass as buccal ganglia (in Nautilus) were correct – we should have buccal ganglia in connection with the branchial ganglia – an occurrence unknown so far as I am aware in the mollusca

I confess I am quite at a loss to comprehend how the optic nerves can be said to come off from the inferior oesophageal masses – in any Cephalopod – especially Nautilus – If any anatomical fact can be clear it seems to me clear that here they come off from the extremities of the cerebroid commissure – where the nerves are more delicate as in Argonauta their origin seems to me to be if possible, more clearly not from the suboesophageal masses –

The commissural appearance of the brain of Nautilus is no argument against its being a cerebroid mass for in Patella Haliotis [?] - & other Gasteropods it is equally band like –

The attachment of the otolithian sacs to the pedal ganglia – is an observed fact in I believe every Gasteropod & Plecopod which has yet been examined

I can answer to a good many myself

As to the Heteropoda – in Firola & Atlanta – I have observed their attachment to the supra-oesophageal ganglia

[p4]

I was greatly puzzled by the anomaly at the time and I cannot account for it now – it is worthy of remark however that in [? & ?] the nearest allies of the Heteropods – the pedrils[?] of the otolithian sacs are very long

So far as the Acephala are concerned – it is I know stated by Owen on [? Name] authority that the otolithian sacs are attached to the labial ganglia – with what correctness the following translation will shew: -

“Both auditory capsules *lie hidden in the foot of certain Lamellibranchiata anterior to the pedal ganglia and are continually in communion with them*; being either closely applied to them or somewhat distant, and connected by two auditory nerves with these ganglia” [?? Journal name] p 361

In a note he quotes *Cyclas*, [?], Anodonta, Unio, Cardium & [?] – as genera in wh[ich] he has observed them in this position –

By the way – some of these days when we know one another better – (and I trust it may be before long) I think we shall have a laugh over your ascription to me of over-reverence of our friend the Hunterian Professor –

[p5, new sheet]

My impression is that [?Author name] *figures* the otolithian sacs of Gasteroptera in his beautiful plates of which no description has yet been published – at this moment however I cannot refer to them–

Now as to inferences – I quite agree with you that the buccal ganglia are admirable fixed points – and taking them as such I come to conclusions precisely the reverse of yours – I find that the nervous centres of all Cephalopoda Gasteropoda [?]& Heteropoda (except the position of the aud sacs in this case) may be thus represented:

[diagram][1]

all the varieties arise from the greater or less approximation or separation of their pairs of ganglia –

I can see no essential difference whatsoever between Nautilus & Aplysia or Patella – and of course not seeing any, I cannot adopt your view of the case

II. I must still maintain that anatomy justifies the comparison between the mantle of Cleodora & that of Cephalopoda – the sole difference I can see is that the muscular layer – the sleeve – is better developed in Cephalopoda than in Cleodora

[p6]

The mantle of Sepia is no less a "fold of the skin" than the mantle of [?] – the only difference that I can see is that the muscular fibres are much better developed in the former case than in the latter –

III I must altogether demur to your general proposition that 'all Oceanic Mollusks swim inverted'; [? Taxon name] does not do so, which the closely allied genus Atlanta does - ; yet the position of the buccal organ is the same in each –

I do not understand how you make out that the Cephalopoda are less able to fix themselves upon any surface than the other Mollusks - It seems to me that of all Mollusks they have the most helpful means of fixation in any position they may think fit to adopt – and I cannot therefore see any possible teleological explanation – for the position of their buccal organ - ; which if your view be correct renders them anomalies in the whole Molluscous subkingdom

I can as little agree with your proposition that the buccal organ is abnormal in character – I do not find it to be essentially different from that of Aplysia –

[p7]

IV I am still stiffnecked touching the shell – The shell – or rather egg-hatching apparatus of Argonauta is formed upon my theory by the upper surface of the foot a very proper place for the secretion of calcareous matter – as we see in the operculum of Gasteropods – But I know no instance in all the Mollusca of a shell being formed in the middle of the substance of the foot – as it must be according to your theory in Sepia etc –

V Finally, I can by no means agree with you that Embryology has not yet spoken out – I confess that I regard the memoirs of Kölliker – Vogt – Van [?] & [?] & Gegenbaur as providing as complete a history of development, as we possess of most classes of the animal kingdom – But I will take your objectives seriatim:

1. The difference between the development of Sepia & that of Acteon as regards the relations of embryo & yolk – is not greater than that, between the development of the bird and that of the frog – And, if there were any difficulty on this score, the gap is bridged over by Argonauta, in which the embryo & the yolk are of about equal size, only, at starting -

[p8]

2. It is very true that in his summary Vogt says that the mantle is not formed until after the otoliths – and yet you will find if you work on his description & figures – that this assertion is true only, of the mantle in its complete form – when the mantle cavity has become developed -; the mantle cavity however, is by no means central to the mantle – and the rudiment of the latter exists as soon as the ciliated lobes –

The very start of the development of the ciliated lobes indeed – marks off the central portion of the germinal membrane as the mantle – the outer portions as the head & foot – Whatever be the order of the complete development of the parts – it is absolutely demonstrable that in Acteon the central part of the germ [abbrev for germinal membrane?] becomes the mantle – and it is the centre of the germ of the Cephalopod which becomes the sleeve – It is the same with the Gasteropoda –

I trust I have made myself understood – I have said many things in the indicative mood which would, I am aware, have been more becoming put in the potential – but the former was more concise & on that ground pray forgive it – I hope that our friendly controversy may ripen into friendly coincidence – Pray let me see you if ever you come to town – [??]

Faithfully yours |T. H. Huxley| Many thanks for your papers –

I hope you will send me Ommastrephes when he appears

Note 1: Diagram is of the anterior end of a mollusc with nerve ganglia shown.

HP 17.261 AIC

Albany Hancock to Thomas Henry Huxley, 28 June 1852 HH8

SUMMARY

This is the letter in which Hancock finally recants some of his own views on molluscan homologies and accepts many of Huxley's. Hancock has changed his mind largely because of Huxley showing him that Richard Owen, whom Hancock had previously regarded as an authority, was not always right.

TRANSCRIPTION

[261]

St Mary's Terrace – Newcastle on Tyne

28 June 1852

My dear Sir

You have taken me completely by surprise respecting Nautilus (Argonauta); I never dreamed that Owen could have missed the buccal ganglions especially as he describes four pairs of nerves that go to the very parts that are usually supplied by these ganglions. His mistake is not a mere slip, for if true buccal ganglions exist the nerves from the commissure or brain cannot go to 'the tongue and muscles of the jaws'. The whole of these nerves have been erroneously determined. And yet the Professor does not give way. In his lectures where he mentions small pharyngeal ganglions it is still stated that these nerves go to the "muscular and other parts of the mouth". May not these pharyngeal be gastric-oesophageal ganglions?

[262 L]

I have lost however all confidence in this dissection of Nautilus; and as it appears that this most important link in my argument is broken I have thought it best to withdraw, for the present, all that portion of my paper relating to the homologies and to confine it to a mere description of the nervous system of Ommastrephes. If the pharyngeal are really buccal ganglions there can be no doubt that the funnel is situated below in Nautilus; and the relationship between it and the naked Cephalopods is obvious enough. –

I describe in Ommastrephes two pairs of buccal ganglions, the upper pair according to your view rests upon the buccal capsule – apparently the buccal retractors, and are connected by cords to the optic ganglions or brain, and to the lower buccal ganglions; they are

[262 R]

likewise united by cords to the sub-oesophageal mass, or what you call pedal ganglions. These two pairs of buccal ganglions I deemed homologous with the commissure or brain of Nautilus; but this of course cannot now be maintained. My upper buccal ganglions are most probably true cerebroids and

are equivalent to the brain of Nautilus, – the chief difference being that in the last they are placed between the optic ganglions while in Ommastrephes these latter centres are brought together on the median line and are fused into one mass – their union with the cerebroids (upper buccal) being effected by a long slender commissure. If this be really correct it is a very interesting modification of these parts.

That which is usually called the brain in the Cephalopods is assuredly only the optic ganglions, in union, perhaps, with the olfactory centres.

[263 L]

I am disposed to look upon the ganglionic modules attached to the roots of the optic nerves as olfactory ganglions. And if so it would seem probable that the ophthalmic tentacles of Nautilus are the true organs of smell. The laminated structure described by Owen is perhaps for touch or taste. And indeed if the suboesophageal mass be the pedal centre analogy contradicts Owen's opinion; and on the other hand if our friend be correct how do you explain this anomalous fact for the olfactory organs are always in connexion with the cerebroids.

The anterior suboesophageal ganglions of Ommastrephes are divided into two pairs, one being placed in advance of the other; thus these are two distinct centres which give off the brachial nerves, - sensitive and motor. The brachial nerves are composed of two filaments,

[263 R]

one from each centre; of this there is no mistake, and a beautiful proof it is of the compound nature of the ganglions of the mollusc.

The stellate ganglions of this cephalopod are united by a cord across the median line, so that they may be said to be conjoined above the alimentary tube. This is anomalous if these are to be looked upon as branchial centres; no gasteropods, so far as I know, have these ganglions united along the oesophagus. In this respect Ommastrephes would seem to differ from Nautilus.

The buccal ganglions of the gasteropods are always, as you observe, united to the cerebroids by a nervous trunk or commissure; but I cannot agree with the opinion that therefore the buccal nerves are cerebroid nerves. The pedal and branchial nerves might just as well be so considered; and indeed the centres from which

[264 L]

these latter nerves arise do ultimately become blended with the cerebroids, the buccal never; the latter are permanently distinct from the other centres.

Are you not too general in your assertion that the auditory sac "is attached to the pedal ganglions in every gasteropod and [?] which has yet been examined"? – I have examined Eolis and Doris and find it appended to the cerebroids. Souleyet, too, figures it in Eolis in exactly the same situation, and according to the same authority the auditory organ is connected to the cerebroids in Acteon and [?taxon]. There would therefore appear abundant evidence that this organ is, at least in some of the Gasteropods, connected to the cerebroids. The Heteropods too have undoubtedly the auditory capsule appended to these centres –

Souleyet neither figures nor describes the auditory sac or otoliths of Gasteroptera.

[264 R]

We possess both the plates and descriptive work of this valuable work which the author was so good as to send to us two or three months ago, - and thus for once the country is before the town. – I find, too, on his authority that almost all the oceanic Molluscs – the Heteropods without exception – swim inverted, as does likewise Gasteroptera. It is therefore fully evident that if the Cephalopods do not do so that they must be an exception to the general law –

I must now in conclusion thank you for all the trouble you have taken to explain to me your views, and to place within my reach such information as was necessary as to enable me to arrive at just conclusions respecting the homologies of the

[265 L]

Cephalopods – I shall have much pleasure in perusing your paper on this subject, as I expect to derive much information from it.

Hoping that the period may not be distant when I shall have the pleasure of shaking you by the hand

I remain | My Dear Sir |Yours sincerely |Albany Hancock

NEWHM: 2017.H64.5

Thomas Henry Huxley to Albany Hancock, 7 July 1852 HH9

SUMMARY

This is something of a miscellany letter. Huxley begins by saying that he admires Hancock's work on a squid but that he interprets squid anatomy differently to Hancock. However, he says he won't go into detail at this stage about their apparent difference of opinion until he can send Hancock a paper of his, presumably in press at the time, which contains relevant evidence. He then says a bit about sea squirts and cellulose.

TRANSCRIPTION

41 North Bank.

July 7th [1852]

My dear Sir

I am quite ashamed to see how long your last note has remained un-acknowledged – but I have been very busy and without time to look at anything – Allow me to express my admiration of the way in which you

[p2]

have set forth the nervous system of Ommastrephes in the Annals – I take it that there is no account of the nervous system of Cephalopoda to come near it in point of minute & careful analysis

Shall I confess that I have been very comfortably interpreting it all my own way? But I will have nothing more to say on that subject until I can send you my paper with all

[p3]

the evidence I have been able to scratch together –

I shall then be very anxious for your judgement upon it –

I have just been getting such a blowing up from a man to whom I was obliged to suggest certain differences of opinion that I am quite refreshed by looking over the tone of your letters – I trust our correspondence may not end with our small controversy

[p4]

By the way, Forbes tells me that you have been examining Pelonaia. Have you printed any account of it? And if not will you tell me – in what respects it differs from other Ascidians especially with regard to the termination of the anus – in or out of the branchial sac? I cannot quite make out Goodwin's description

I am working at the Ascidians and hope to get some good results out of them

I have already arrived at a result of some physiological

[p5, new sheet]

importance viz. that Cellulose is present in the larva, before it possesses any organs –

It must therefore be elaborated as in plants and is not the result of the digestion of Diatomaceae as [author?] and Köllicker supposed.

- A result of no small importance for the question of the existence or non existence of a line of demarcation between plants and animals –

If you have any separate copies of your paper

[p6]

on Ommastrephes may I beg for one?

I am | My dear Sir | Faithfully yours | T.H. Huxley | [To] Albany Hancock Esq

N.B. The country *was* before the Town but not long – London has been blessed with Souleyet's book about a week – I do not find much in the anatomical part that was not already in the Comptes Rendu – I seem to have blundered touching Gasteroptera

HP 17.265 AIC

Albany Hancock to Thomas Henry Huxley, 15 August 1852 HH10

SUMMARY

Hancock asks for Huxley's opinion on the interpretation of certain nerve ganglia in cephalopods. There are miscellaneous other points, all very briefly put.

TRANSCRIPTION

[265]

St Mary's Terrace – Newcastle on Tyne

15th Aug – 1852 –

My dear Sir,

I have much pleasure in sending for your acceptance a copy of my paper on the nervous system of Ommastrephes; and am glad to find that it meets with your approbation. Should it assist in determining the homologies of the Mollusca, and in any way prove the accuracy of your views on the subject I shall feel that my labour has not been in vain. –

When last I had the pleasure of writing to you I stated that what I called the upper buccal ganglions would probably prove to be the cerebroids, and that the so called

[266 L]

brain or optic lobes were nothing else than the optic ganglions – the same as in the Gasteropods. Sometime when you have nothing better to do I should like to hear your interpretation of these ganglions of Ommastrephes. If the above notion be correct then the buccal capsule, as I have called it, is equivalent to the channel of the mouth of the Gasteropods. I have laid this subject aside for the present, and am now more fully engaged making drawings for the 6th and last part of the Nudibranchs. I shall, however have great pleasure in receiving your paper on the homologies. And

[266 R]

by and by I hope to dissect Loligo, two specimens of which I have just procured. I should like also to try my hand with Octopus if I can fall in with it. –

I am glad to learn that you are busy with the Ascidians, and have already obtained important results. Forbes is wrong, I have not examined Pelonaia or should have much pleasure in supplying the required information. Would you like specimens to dissect? If so Mr Alder desires to say that he will gladly send you a supply. –

I am | My dear Sir | Sincerely yours | Albany Hancock | [To] Thos H. Huxley Esq.

NEWHM: 2017.H64.6

Thomas Henry Huxley to Albany Hancock, 24 August 1852 HH11

SUMMARY

This is one of the most technical letters of the whole correspondence. It covers structural details of sense organs and the nervous system in multiple molluscan taxa. Most of the taxa referred to are groups of cephalopods. The letter is 10 pages long. On page 2 is a diagram of a dissection of a mollusc. A long quote from Kölliker is included.

TRANSCRIPTION

41 North Bank, Regents Park

Aug 24th 1852

My dear Sir

Many thanks for your valuable papers upon Ommastrephes [squid] and the olfactory apparatus in the Bullidae – both I think contributions of no small importance to the anatomy of the Mollusca – With regard to the question you put – I should hold by your name of "upper buccal" for the ganglia to which you refer – Finding as I do that the [?] mass (c') Pl II fig. 2. represents the true cerebroid ganglia

I subjoin on the next page – a copy of a dissection of the nervous system of Patella with which that of Ommastrephes seems to me to be strictly comparable if you allow for the opposite direction of the elongated pedal ganglia caused by the opposite flexure

[p2]

of the axis of the body in the two cases – The only difficulty appears to be

[Diagram on LHS on this page][1]

in the cords of c and g pl II fig 2 – are the cords c commissural answering to one of the commissural cords of Patella? or are they only continuations of the cords g which if they be independent have no homologues in Patella?

I do not think it is a matter of much importance which interpretation we accept -

The hint you throw out about the olfactory organ in your paper (p. 8) makes me think that the following passage from Kölliker's [?] to which I have so often referred will be of interest to you – I translate verbatim and literatim so that you may make use of having all that K says –

[p3]

"In seeking in adult Sepia for an external ear & canals similar to those of embryos – I found close to the eye on each side, an aperture in the skin, in which I at first thought I had found the [??] although it led only into a little cutaneous pit and no further - ; Examining other Cephalopoda which came into my hands, I found in Loligo sagittata – Sepiola [sp] and rondoliti in Octopus vulgaris and Eledone marchata – similar pits, in which in the two latter a little papillary white body was contained; in Argonauta & [???] lastly this last body only, surrounded by a shallow depression or almost none at all – was present - Since I had found in embryos at an early period a small papillose elevation in the place where the pits subsequently existed – I paid attention to these parts – but could arrive at no satisfactory conclusion till, first in [? taxon] and then in all the others, I discovered an especial nerve passing to the papilla or pit – which from its peculiar course gave a determinate direction to my ideas –

[p4]

This nerve namely[?] sprang from the trunk or from the ganglion of the optic nerve – ran through the orbit – then pierced the cartilaginous capsule and so enters the organ in question – I had then found a [?] of pits with papillae or papillae alone, in the head, in the neighbourhood of the eyes; which were provided with a nerve of relatively very considerable size and were distinguished by their peculiar course and their origin from a nerve of sense; - & I naturally concluded I had discovered an organ of sense – Its position there was sufficient to determine it to be a nerve of smell and not of taste –

The *olfactory organs* exhibit the following peculiarities in different genera – In all Decapods they lie close behind the eyes, somewhat towards the abdominal side so that a line drawn from there forwards, parallel to the axis of the body – in Sepia and Sepiola [?] cuts the edge of the lower eyelid, in Loligo and Sepiola Rondoliti passes one or two lines below it

[p5, new sheet]

In Loligo, Sepiola macrosoma & Sepia the olfactory pits are shallow depressions with a rounded elongate aperture so so small & inconspicuous, that it requires considerable attention to perceive them; in Sepiola rondoliti on the other hand they are very easily visible – so that I can recommend this animal for a full investigation – Here they appear primarily surrounded by a white wall which I met with less marked in other cases, - & which is often so thick that the whole resembles the Papillae[?] of other Cephalopoda – except that in the middle of the elevation we find a circular aperture –

In the Octopoda the olfactory organ is also behind the eyes close against or upon them – yet somewhat towards the back of the head – so that it comes to lie in the angle produced by the attachment of the mantle on each side of the head – In Octopus vulgaris the olfactory pits are quite covered by a cutaneous fold and hardly to be seen – they exhibit thickening in their walls as in Sepiola rondoliti but to a less extent; Eledone marchata has [??]

[p6]

deep pits with sharply circumscribed, round external openings on whose wall a long papilliform white process exists; Argonauta & [?] lastly possess only two white elongated roundish papillae – Concerning the structure of their parts I can say nothing as I only examined spirit specimens probably an epithelium will be found in these fossae – such as mucous membranes possess & will probably with cilia; forming even what appeared to me to be papillae are pits with a very narrow aperture and a great number of folds of the mucous membrane – similar to the pits in Sep. [Sepiola] rondoliti, which often look like papillae – I do not pretend however, to say anything as to the minute structure of these olfactory organs, whose processes I believe I have made out and I leave to those who are near to the sea, to collect minute information from living animals –

As to the olfactory nerves – it has cost me much trouble to follow them out into the orbit

[p7]

since in most Cephalopoda, which have been preserved for even a short time in spirit, the optic ganglion and the fatty mass of the eye are changed into a more or less semifluid mass; the passage of the nerve through the cartilage capsule of the eye was more readily traceable and its course to the organ itself could be traced without much difficulty – In Argonauta and [?] the olfactory nerve arises from the little ganglion, which lies close to the optic ganglion (see Van Beneden[?] Exercises Anatomiques fasc. 1. pl. 1) in Sepia, out of the trunk of the optic n[erve] itself – and it is therefore during the first part of its course perhaps even in its origin out of the superior oesophl. ganglion, not an independent nerve but lies close against the optic n[erve] and runs with it through the hole which leads into the eye-capsule. In the others I did not follow the nerve so far as its origin but only as far as the orbit or in the most favourable cases close to the optic nerve or the foramina[?] optica – and thence I must leave it undetermined – whether in there it is

[p8]

isolated or connected with the optic nerve – from the bottom of the orbit or after being given off by the optic n. The olfactory n., closely applied to the inner wall of the cartilaginous orbit [?] outwards & downwards or outwards & upwards according to the position of the olfactory organ – Its course is [?] at first at first a little backwards & then a little forwards – it penetrates the cartilaginous wall of the orbit near its margin – [?] in the Decapoda under the skin in the Octopoda under the muscles which fasten the mantle to the head – first straight backwards & then again forwards, to terminate in the olfactory pit – The expansion of the olfactory nerve which gives off no branches during its course is beautifully seen in Sepia, where having reached the base of the pit it splits out suddenly into numerous ramifications, & in [?]& Argonauta where it penetrates into the middle of the papillary projection, divides, & so far as I could make out in preserved animals at last terminates at the surface with fibres perpendicularly to the surface of the papilla – or rather radiating from its centre – (loops?) which are covered with

[p9, new sheet]

[?] cells probably an epithelium – In Sepiola Rondoliti I found, on examining the nerve microscopically, small accumulations of ganglia/lobules – which I did not discover in the others – The olfactory nerve is relatively large in [taxon?] & Argonauta in the others delicate & fine - ” *Kölliker Entwickelungs geshcichte p.* 107-9.

Kölliker afterwards attends to the analogy with Nautilus & traces the development of the organ – as a *papilla with a central depression*, in Sepia

This is I believe all has been done by anybody with regard to the olfactory organs of the Cephalopoda – If you have not met with the [?] elsewhere I hope it may save you unnecessary trouble –

I am very much obliged to Mr Alder for his offer – I should be very glad indeed of some specimens – as Pelonaia appears from the descriptions to be an aberrant form – Anything of this kind if sent to me to Mr Gray's care, British Museum, will reach safely –

[p10]

I hope we shall meet at Belfast – I have not as yet heard what is to be the fate of my Mollusk paper – As soon as it is printed you shall have a copy –

I am | My dear Sir | faithfully yours | TH Huxley | [To] Albany Hancock Esq

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Note 1: Diagram is of part of the nervous system in the mollusc *Patella* (limpet).

HP 17.267 AIC

Albany Hancock to Thomas Henry Huxley, 15 November 1852 HH12

SUMMARY

Hancock thanks Huxley for his previous letter with a quote from Kölliker. He says that he thinks Kölliker's views are correct. Uncharacteristically, he speculates about the nature of high-level taxonomic groups; this is related to the distribution of cellulose. Hancock considers the possibility that high-level groups are not distinct, and poses the question of whether a particular animal might not be both a vertebrate and a mollusc. He is also sending Huxley specimens of the ascidian Pelonaia.

TRANSCRIPTION

[267]

St Mary's Terrace – Newcastle on Tyne

15th Nov 1852 –

My dear Sir

I at length send you a couple of specimens of Pelonaia which I have procured from Mr Alder for your use, and I only hope that they may still be in time to be of service to you. They should have been sent sooner, but I delayed in the hope of obtaining fresh specimens as Mr Alder was lodging at Cullercoats. He did not, however fall in with any, and those now forwarded have been in spirit for two or three years; but I hope they will, notwithstanding, answer your purpose. –

Your account respecting the

[268 L]

ascidians is very interesting. I long to see your report on the subject. Have the Bryozoa been examined for cellulose. It would be desirable to know if they contain this substance. The Brachiopoda also should be examined for it. If there should be no line of demarcation between plants and animals why should we expect to find the great Zoological groups with strictly defined limits – may not the Vertebrata and Mollusca, for instance, blend so that an individual may be as much one as the other, just as with plants and animals?

[268 R]

If not, then, is it not likely that these two such kingdoms are radically distinct?

I sent to Mr Woodward [?] a few days ago a copy of the paper on Doris; this I suppose you have received. -

I have to thank you for your last long and interesting letter containing a quotation from Kölliker's memoir relating to the olfactory organ of the Cephalopods – I was pleased to see his remarks on this subject, and have no doubt that he is correct. –

I think that there is a greater difference between the nervous systems of Patella and Ommastrephes than you are

[269 L]

inclined to suppose; but as I have not dissected the former I will not, at present, trouble you with any remarks. By and by I intend to examine this animal; for it is undoubtedly one of the best to compare with the Cephalopods. I shall then be able to form a more decided opinion, and you shall hear what it is. - At present I can get everything done for the Nudibranchs. I shall be employed the whole of this winter with the anatomy for the concluding part of our work -

I remain | My dear Sir| yours truly | Albany Hancock | [To] T. H. Huxley Esq.

NEWHM: 2017.H64.7

Thomas Henry Huxley to Albany Hancock, 18 November 1852 HH13

SUMMARY

In this letter, although there is brief mention of a few specific taxa, the theme is broad. Huxley expresses his belief that, contrary to Hancock's view (expressed in his previous letter) there are no intergradations between the forms of each great group of animals. He refers to Von Baer likening the body plan and variations on it of each great group as being like fugue and variations in music.

TRANSCRIPTION

41 North Bank, Regents Park

Nov 18th 1852

My dear Sir

Many thanks to Mr Alder & yourself [last 5 words added as an insert] for your specimens of Pelonaia which I shall be very glad to examine – Between illness & other occupations I have been unable to work at the ascidians lately – but I am about to resume the subject

[p2]

Cellulose is not found so far as I am aware any where save in the ascidians – The horny parts of the Brachiopoda contain Chitin and so I believe do the skeletons of the Polyzoa –

I do not think that any single chemical or physiological character will ever suffice to distinguish one group of animals from another, but I have great faith in the sharpness and distinctness of the great groups, nevertheless.

[p3]

Nor do I think that if they are properly and [?] defined any transition will be found from one to the other – Von Baer long ago beautifully compared the type of each great group to the theme of a fugue – a simple combination of notes worked out into infinite variations – so long as the fundamental theme however remains distinct in each group it is clear that any approximation between the

[p4]

forms can be only apparent

However, this is a wide subject and one that can only be settled when we have a scientific Morphology for each of the great groups

I have not yet received the paper you have been kind enough to send – probably in consequence of not having been at the Museum lately – I thank you for it however in advance – having already carefully studied it & knowing its value

Ever my dear Sir | Faithfully yours | T. H. Huxley | [To] Albany Hancock Esq

HP 17.269 AIC

Albany Hancock to Thomas Henry Huxley, 28 March 1853 HH14

SUMMARY

This is mainly a thank-you letter for Huxley's paper on the morphology of the cephalous Mollusca. But Hancock notes his continued reservations about some points of detail.

TRANSCRIPTION

[269 R]

St Mary's Terrace, Newcastle on Tyne

28th March 1853

My dear Sir

Allow me to thank you for the copy, which you have so kindly sent me, of your valuable paper on the morphology of the Cephalous Mollusca. As yet I have only had time to glance it over, and was anxious to have re-perused it before writing; but must not delay longer to acknowledge the receipt,

[270]

and to express to you my high appreciation of the vast importance of your memoir; it cannot fail to lead to correct views respecting the relationships of the various molluscan groups of which it treats.

In reference to our old discussion I may state that I am still rather sceptical as to *some* of the points alluded to, but perhaps on a more careful reading of the paper I may find occasion to change my opinion as to these –

I remain, my dear Sir | Yours truly | Albany Hancock | [To] T.H. Huxley Esq.

HP 17.271 AIC

Albany Hancock to Thomas Henry Huxley, 23 April 1854 HH15

SUMMARY

This seems to be the first letter in which Hancock discusses anatomical details of brachiopods. Note that these animals were then thought to be molluscs. (They are now recognized as an independent phylum.)

TRANSCRIPTION

[271]

St Mary's Terrace, Newcastle on Tyne

23rd April 1854

My dear Sir

I am very glad to learn that you have arrived at conclusions similar to those I am inclined to adopt respecting two or three disputed points in the anatomy of Terebratula. So long ago as the autumn of 1852 my attention was drawn to the subject by Mr Woodward who himself supplied me with specimens of Waldhaemia flauescens. I made at the time several dissections, and came to the conclusion that the intestine terminated on the median line of the ventral pallial lobe, directly behind the adductors. But I in vain endeavoured to find the anal orifice. I did not then venture to conclude that the termination was caecal though from what you say respecting Rhynconella I cannot

[272 L]

now hesitate. –

I am disposed to look upon the 'hearts' as oviducts. I could find nothing to warrant the belief that they are blood propelling organs. – They are not divided into auricle and ventricle, and I could find no arteries leading from them. They appeared to me to be two simple, curved, trumpet-formed organs, each having its expanded, laminated mouth opening into the visceral chamber or great blood sinus, and the other tapering extremity passing diagonally through the pallial membrane, and communicating by a small orifice with the pallial chamber. These external orifices are situated one on each side of the median line near to the oral aperture.

If seen through the pallial membrane these organs would have this appearance –

[Small diagram in two parts, both labelled a and b]

a, external orifice

b, internal orifice, or expanded mouth –

[272 R]

There is one point, however on which I was not quite satisfied, - I could not be sure that the external orifices were not accidental, though I saw them on two or three [?]; and certainly they had the appearance of natural apertures. But still if so, what I saw others ought to have seen, so I was anxious to have this important point corroborated by further observations. – In the meantime it seemed to me that these peculiar organs could not be hearts. And as the theory of the escape of the ovary by rupture of the pallial membrane is not satisfactory I sidestitched[?] another, in which I suppose the eggs to enter the visceral chamber, and to be received into the expanded mouth of this so-named 'heart', and in this way pass out externally. The inner expanded portion has a glandular character and perhaps secretes some covering to the eggs on their passage out. –

[273 L]

I have seen nothing like the bands which you describe in Rhynconella as given off from the 'ventricles' and passing into the stems of the ovary or testis. They are probably the arteries of Owen. It is, indeed, curious that there should be four of these organs in this genus. – I can scarcely think that they are urinary. Are the urinary organs of the Lamellibranchs sufficiently determined? May they not be glandular apparatuses in connexion with the female parts. – The urinary organs in the Gasteropods have nothing to do with the genitalia. –

From the above it must be obvious to you that my views in this matter are somewhat crude; and I must confess that I feel that more information is required before we can arrive at any definite conclusion; though I think sufficient is known to warrant a disbelief in the function of the so-named hearts. – I hope you will

[NO ENDING. PAGE MUST BE MISSING. BUT PROBABLY NEAR END.]

NEWHM: 2017.H64.8

Thomas Henry Huxley to Albany Hancock [date probably April/May 1854]

[No start to the letter; at least one page is missing.] HH16

TRANSCRIPTION

I cannot find a trace of true muscle fibres in these so-called hearts in either Waldheimia or Rhynconella.

My main purpose in writing to you about this matter is to beg, if it is not too much trouble, that you will favour me with an exact statement of the views which you hold on these matters – in order that I may give you due credit in a communication I am about to make on the subject to the Royal Society – I do not

[new page]

like to quote from [??] what your views are. I wish by the way, that I could persuade you to send us up a short paper for printing in the Proceedings (not the Transactions) on any subject which may have turned up in the course of your work – We are very desirous of making the Royal Society's Proceedings a vehicle for such matters of interest which investigators have not time or inclination to work out completely – and it is on this ground that I am going to send them some fragments of Brachiopod anatomy.

Ever my dear Sir | faithfully yours | T.H. Huxley | [To] Albany Hancock

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HP 17.273 AIC

Albany Hancock to Thomas Henry Huxley, 11 May 1854 HH17

SUMMARY

Hancock says he has been examining brachiopod specimens; he discusses aspects of their anatomy, including structures that may be hearts. Interestingly, he states that these structures "do not resemble the molluscan heart". He also notes a similarity with the 'Polyzoa' (now the Bryozoa, a separate phylum).

TRANSCRIPTION

[273 R]

St Mary's Terrace, Newcastle on Tyne

11th May 1854 –

My dear Sir,

Since the receipt of your last letter I have been examining a specimen or two of Lingula which I had by me for the purpose; but which lacking the stimulating effect of your communication might have remained for some time untouched. I find that the so-called hearts in this genus appear to terminate in exactly the same ways as they seem to do in Waldhaemia, that is they seem to open externally. They undoubtedly open through the inner layer of the parietes; this is certain and I am almost satisfied that they also open through the

[274 R]

external layer, but this in my specimens was so very delicate that I cannot even yet after all my care, pronounce with certainty. Another specimen or two and the matter will be settled, for I can now go at once to the very spot where the orifices are, if they really exist, and so avoid the risk of injuring the part. -

These organs do not appear to be muscular; I can trace no fibres in them, and the inner surface is covered with a stratum of red, granular gland-like matter. And though in Lingula they are certainly divided into two parts which may be looked upon as auricle and ventricle yet they do not resemble the molluscan heart. The part which would correspond to the auricle is much too strong. In the Mollusca this is

[274 R]

always exceeding delicate. –

I scarcely know what to think of your explanation respecting the ‘bands and vesicles’. I have not examined these with sufficient care to venture on an opinion; but I do not see how a heart can act immediately through a system of lacunas in the thickness of the parietes without the aid of trunk channels, and if such exist, I think, we must have seen them. I can find no such channels leading from the apices of the heart in Lingula. –

If the so-called heart proves to be oviducts, then in what condition is the circulation of these animals? Where is the propelling organ? – How does the blood reach the pallial margin, and what draws it back into the visceral chamber? – Perhaps cilia

[275 L]

may be the agents here as in the Bryozoa. But conjecture at present is idle, for in a short time the nature of these enigmatical organs will be determined and it will then be soon enough to theorise. –

I am much obliged to you for your remarks respecting the Royal Society. I was led to understand that the Council was desirous of having communications which required illustrations, or I should never have thought of offering a purely anatomical paper. – That on the Bullidae will require several plates, so I think it will scarcely do for the Proceedings. Should I draw it up I shall most likely append it to the ‘Annals’ –

I am, my dear Sir, | yours truly | Albany Hancock | [To] T.H. Huxley Esq.

NEWHM: 2017.H64.9

Thomas Henry Huxley to Albany Hancock, 17 May 1854 HH18

SUMMARY

Huxley is discussing with Hancock the interpretation of structures seen in dissections of the brachiopod *Lingula*, and saying that their findings and views match. He says that he agrees with Hancock's view that there is a similarity between brachiopods and 'Polyzoa' (Bryozoa).

TRANSCRIPTION

4 Upper York Place

St John's Wood

May 17th [1854]

My dear Sir

Your results with regard to Lingula agree very closely with my own in the dissection of one I made a little time back. Air blown in to the animal with a pipette passed out between the layers of the mantle as if there were such an aperture as you describe – However I could come to no certain conclusion and I am obliged now to give

[p2]

up all further inquiry into the subject – for some months – as I have been suddenly called upon to continue Forbes' course at the School of Mines ay Jermyn St – He, as you know, has just recently been appointed to Jamieson's chair in Edinborough –

so I shall only need a notion of what I have made out about the 'bands' & caecal sections & from hearts in Rhynconella

[p3]

for the Proceedings of the Royal [Society] – and wait with anxiety until the solution of all our difficulties comes from skilful hands.

I think however that if you examine the thick fold which unites the anus in W. flavescens you will find as I believe I have done a system of ramified irregular canals continuous with others which permeate the whole mantle between its layers –

Whether the so called hearts are connected with

[p4]

these ramified canals appears to me to be quite another question –

I quite agree with you in the extreme diminution of them again from all other Molluscan hearts – I may add that I have thoroughly convinced myself of the perfect justice of your comparison of these animals with the Polyzoa – Did the resemblance between the Terebratula shell and other [?] ever strike you?

Ever yours very faithfully | Thomas Huxley | [To] Albany Hancock Esq.

NEWHM: 2017.H64.10

Thomas Henry Huxley to Albany Hancock, 7 Sept 1854 HH19

SUMMARY

Huxley is asking Hancock's advice about the identification of a type of nudibranch mollusc that he has found on the Welsh coast. He asks if it would be worth posting specimens to Hancock. Here, he sends small sketches of it.

TRANSCRIPTION

41 Cork Houses, Tenby

South Wales

Sept. 7th 1854

My dear Sir

There is a small colony of naturalists here – Mr Buck, Dr Carpenter & myself, and among the things which have turned up is the beautiful nudibranch of which I enclose a very hasty sketch[1] – Dr Carpenter found it & he tells me that he discovered it when here ten years ago

[p2]

I can find no figure of it in your beautiful monograph but I fancy I am right in supposing it to belong to your genus Antiopa – from the inequality of the tentacles – the way in which the dorsal ones are laminated and perched up upon a sort of rostrum – and the union of the rows of branchial papillae in part of the head

However you have not yet given any description of the external character of the species of Antiopa

[p3]

which you describe & I am therefore very curious to know whether it is the same or not –

Will it be worth while to send you specimens if we get any more? I shall be very happy to do so if you wish it –

Ever yours very faithfully |Thomas H. Huxley | [To] Albany Hancock Esq

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Note 1: Four very small sketches on a piece of card 3x2 inches accompany the letter.

HP 17.275 AIC

Albany Hancock to Thomas Henry Huxley, 8 Sept 1854 HH20

SUMMARY

Hancock replies that Huxley's specimens belong to the species *Antiopa cristata*. He says that the sketch Huxley sent him is 'conclusive' in terms of coming to this definite identification.

TRANSCRIPTION

[275 R]

St Mary's Terrace, Newcastle on Tyne

8th Sept 1854 –

My dear Sir,

I have no hesitation in pronouncing your nudibranch to be Antiopa cristata, - the same whose anatomy I described some time ago in the 'Annals': your sketch is quite conclusive. There are two species, and figures of both will appear in our next part which will be

[276 L]

out before the end of this month. The other species is named hyaline, and is easily distinguished by the characters of the papillae which are tuberculated, and attenuated above, with the tips obtuse; the glands are branched. This may also occur at Tenby.

I should be very glad to receive either species alive as I am anxious to look to the [??] of the papillae which in A.

[276 R]

hyalina appear to be cast off from the surface, and not from a vesicle in the interior as in Eolis. I therefore eagerly accept your kind offer, and shall be most thankful if you will forward to me a living specimen should you be so fortunate as to [?] it again. –

I remain | My dear Sir | Yours truly | Albany Hancock | [To] Thos H. Huxley Esq.

NEWHM: 2017.H64.11

Thomas Henry Huxley to Albany Hancock, 29 December 1854 HH21

SUMMARY

There are two main things here. First, discussion of comparative molluscan anatomy, especially with regard to the presence or absence of the tongue and the shell in some groups. Second, a comment that Huxley is glad to see that Hancock has taken up work on tunicates (sea squirts), and that he (Huxley) hopes to get back to working on this animal group in a few years.

TRANSCRIPTION

Jermyn S

London

Dec. 29th 1854

My dear Sir

I have read your excellent memoir & sent it to the Linnean where it will form a worthy companion to the paper in the present volume

The absence of the tongue in [taxon?] & the other genera you mention is particularly interesting to me – as I have always [?] insisted upon the presence of that organ in the Cephalophorous Mollusks

[p2]

I mean to console myself with the hypothesis that the young [taxon?] – while they have the shell & the ciliated velum have also a tongue – and that this vanishes like the shell does in the adults!

If you are not satisfied with the artist who executed your last plates I should advise you to write to Mr Busk[?] He will certainly do everything that is practicable to meet your wishes

[p3]

I am exceedingly glad to hear that you have taken up the Tunicata – I once did a good deal of work on that subject but it is, and will remain, unpublished as I have shifted by sheer force of circumstances into totally different lines of inquiry – Some three years hence I hope to come to the Mollusca in the regular course of the subjects which I have marked out for my Hunterian lectures – and I shall then put my [??] deeply into the rich store of work which

[p4]

you will by that time have accumulated.

I think you have all that I have written about the ascidians – viz. the papers on *Salpa, Appendicularia,* [genus?] & *Pyrosoma* in the Philosophical Transactions & that on *Pyrosoma* in the Linnean. Then there are some notes in the Proceedings of the British Association & in the Quarterly Journal of Microscopical Science – and in an article called Mollusca which I wrote for the English Encyclopaedia. Many anatomical details are figured in [author's?] Atlas, a collection I contributed [to] However I will look up & send you the titles of these

Excuse my delay in replying to your letter. I ran out of London for a walk in Derbyshire as soon as my lectures for the term came to an end – with best wishes for the new year

Yours very faithfully | T H Huxley | [To] Albany Hancock

HP 17.277 AIC

Albany Hancock to Thomas Henry Huxley, 13 March 1855 HH22

SUMMARY

Hancock thanks Huxley for a copy of his recent paper on the structure of molluscs. He agrees with the main features of Huxley's work, but disagrees with some details. He applauds Huxley's statement that there is a close relationship between the Brachiopoda and the 'Polyzoa' (Bryozoa). He suggests a 2-way split of the animal kingdom – into vertebrates/arthropods and molluscs/radiates.

TRANSCRIPTION

[277]

St Mary's Terrace – Newcastle on Tyne

13th March 1855

My dear Sir,

Permit me to thank you for the copy of your valuable essay on the morphology of the mollusca which you were so kind as to send me a short time ago. I ought to have acknowledged your kindness before now; but wished to peruse your paper before writing. I have now done so, and have much pleasure in expressing to you my [?] of the general accuracy of your views. – Your hypothesis is certainly the most comprehensive that has yet been promulgated, and seems as if it would stand the

[278 L]

test of future investigation. Errors of detail may probably exist; but those who would assail the general doctrine must bring to the question the most laborious research. –

I am not quite satisfied with respect to the epipodium and mesasoma, at the same time there is much in favour of your views respecting the so-named mantle of the nudibranchs. A little anatomical examination will, I think, set this matter to rest one way or the other. – I cannot however agree that the side lobes of Gasteroptera are homologous with the dorsal lobes of Aplysia. – The lobes

[278 R]

of the former are undoubtedly members of the foot – of the true foot – the whole and entire foot; - but those of Aplysia will most probably prove to belong to the skin of the back; - I am also at a loss to understand why you should disallow the branchiae of the nudibranchs to be true gills. – In Doris they are highly specialized organs, and as far as is known subserve no other function than that of

respiration. – In the Eolididae, indeed, the gills receive the hepatic glands; but no such apparatus has been demonstrated to exist in the branchiae of either the Doridídae or the

[279 L]

[? taxon name is unclear]. – It may be questioned certainly how far they are homologous with the gills of Pectinobranchiata; since in the latter they are members of a true mantle, while in the former they are developments of the dorsal skin. –

I am glad to see your remarks on the Polyzoa and Brachiopoda. – There can be no doubt of their close relationship. Is there not, however, also a close relationship between the Polyzoa and the lower polypes. And indeed are not the radiata generally more closely connected with the Mollusca than with

[279 R]

either of the other two great divisions of the Animal Kingdom. And if so should not this kingdom be divided primarily into two sub-kingdoms, - one comprising the vertebrata and articulata, - the other the mollusca and radiata. The two former divisions being distinguished by the repetition of parts along a central axis, - or rather by the development of a series of centres along a common axis; - the two latter by the development of only one such centre. –

Should I come to town

[280 L]

I shall have much pleasure in calling on you; but I have no expectation, at present, of visiting the South –

I am, | My dear Sir; | Yours truly | Albany Hancock | [To] Thomas Henry Huxley Esq

HP 17.280 AIC

Albany Hancock to Thomas Henry Huxley, 7 April 1855 HH23

SUMMARY

A miscellany letter from Hancock. Some points about gastropod anatomy. Then a guarded answer to Huxley's suggestion that they work on a very ambitious mollusc project. Hancock compliments Huxley on getting an academic position. And he bemoans the poor work, and poor book, of an author called Clarke.

TRANSCRIPTION

[280 R]

St Mary's Terrace – Newcastle on Tyne

7th April 1855

My dear Sir,

In reply to your last communication I may remark in respect to Gasteroptera that there can be no doubt that the two lateral lobes are equivalent to the similar lobes of Alcira and the other Bullidae; - that in these the lobes represent the entire foot of the nudibranchs for instance, as is proved by the pedal ganglia sending all their three nerves to them. – In Aplysia on the contrary the lateral lobes receive branches from *only the posterior pedal nerve* – Here then the lobes would appear to be only

[281 L]

portions of the foot, or rather something appended to it which is deficient in the Bullidae; perhaps the operculiferous lobe, - or the side lappets of the Trachidae, - the epipodium, -

The gills of Doris have the nervous element arrayed exactly as in the Bullidae, and I believe as in other Gasteropods; and they seem to me in every respect true gills. They are developments of the dorsal skin, and so are the gills of all Gasteropods. – In some it is true that this skin develops a mantle; and the mantle the gills; but this does not seem to me of much importance. – The mantle of the Bullidae is supplied by the same nerves that go to the cloak of Doris, - that is, by the great

[281 R]

posterior nerves of the branchial ganglia. – But even granting that the gills of Doris do not belong to the mantle, yet as they are perfectly specialized they must, I apprehend, be looked upon as true gills though it be proper to point to their peculiar development.

I was glad to learn something of your views respecting the arrangement of the animal kingdom; but still I am dissatisfied about the Radiata. They may perhaps, but I cannot help doubting it, form a sub-kingdom of equal value to the other groups; but certainly we have still something of importance to learn respecting them. –

I rejoice at the news that you have obtained a post which will allow you to do the great things you mention; and I may add that nothing could be more in accordance

[282 L]

with my inclinations than to assist in working out the anatomy of the mollusca; but before I can fully accede to your proposal I should like to know a little more as to the extent and nature of the publication. To work out the anatomy of all the genera in the same manner as we have done in the nudibranchs would be an undertaking of immense labour; and I find that I must not, in future, devote myself so entirely to non-remunerative pursuits as I have latterly done – I would gladly throw myself, heart and soul, into the project, but must be prudent. As it is however I hope to be able to give you some assistance. –

I suppose you intend giving figures, for anatomical descriptions are very imperfect without them.

[282 R]

I have certainly seen Clarke's book, but paid very little attention to it; for I was quite satisfied of his incompetence by reading some of his papers in the 'Annals'. But he is worse than incompetent; there is a wilfulness in him which prevents him from seeing and understanding, and an extraordinary proneness to misconstrue the meaning of others. – I recollect seeing in one of his publications the flourish about the celebrated microscopist and the bit of leather. Your account of this matter is very instructive, for it shows exactly how much reliance is to be placed on our Author as a cautious investigator. His book I suppose will generally be taken at its just value. –

I have just received a copy of your paper on a new Annelid. –

Yours truly | Albany Hancock

[**Note: Sheet 283** does not exist as such. The text on '283' belonged elsewhere; it is now 287b.]

HP 17.284 AIC

Albany Hancock to Thomas Henry Huxley, 27 Sept 1855 HH24

SUMMARY

This concerns the identification of a specimen of Eolis that Huxley had sent to Hancock but had arrived in poor condition. Also, Hancock sends congratulations to Huxley on his marriage.

TRANSCRIPTION

[284]

St Mary's Terrace

Newcastle upon Tyne

27th Sept 1855

My dear Sir

Yours of the 22nd Inst[1], along with the packet containing an Eolis, did not come to hand until the evening of the 24th; and I am sorry to add that the animal was dead, and partially decomposed. The characters, however, were not entirely obliterated and I think there can be no doubt that it is, as you believe, our E. angulata. My best thanks are due for the trouble you have taken in sending it to

[285 L]

me. I should, indeed, have rejoiced had it arrived in good order, for I had seen only one individual of this apparently rare species. It has nevertheless been of service. I had not previously examined the tongue, and it was desirable that the characters of that organ should be determined, as we could most confidently make up our mind as to which group this species should be referred. Unfortunately the information has come too late, for the last part of our work is

[285 R]

printed off and almost ready for distribution. –

In conclusion allow me to compliment you on your marriage, and wishing you every happiness that that state can confer, I am,

My dear Sir, | Yours truly, | Albany Hancock | [To] T. H. Huxley Esq.

Note 1: There is no sign of this letter; it may have been lost.

NEWHM: 2017.H64.12

Thomas Henry Huxley to Albany Hancock, 14 July 1856 HH25

SUMMARY

Here Huxley writes about two taxa. Of the brachiopods he says he is glad that Hancock has taken them up and offers to send him a specimen of Rhynconella. Of the nudibranchs (sea slugs) he compliments Hancock on his major paper on these, saying that it's the best in the English language. Huxley urges Hancock to send his brachiopod paper to the Royal Society when it is ready – and says he has "more reasons than one" for this. He must already have in mind putting Hancock forward for the Royal Medal.

TRANSCRIPTION

Mus. Pract. Geology

Jermyn S

July 14th 1856

My dear Sir

I am very glad to hear from Mr Davidson that you have been occupying yourself of late with the Brachiopoda – to much good effect – and I hope you found the Waldheimias useful – I can let you have some more if you wish for them – Mr Davidson says you are in want of Rhynchonella

[p2]

so I beg to forward to you by this post my sole remaining specimen of Rh. psittacea. I had reserved it for some fine day when I should have time to go over these matters again but I would far sooner (with the little chance I have of finding leisure) place it in your hands – I hope the animal will turn out to be in good condition –

[p3]

I shall of course be very glad to hear the general nature of your results whenever you can find it convenient to let me know about them – Whatever your verdict may be I shall feel the utmost confidence in the skill and impartiality with which your inquiry has been conducted –

Let me congratulate you with completing

[p4]

the Nudibranchs –

I have so often said that I know of no other Monograph in the English language that you must excuse my repeating it to you

Is the Brachiopoda paper for the Royal? Let me beg that it may be – I have more reasons than one for making the sequel

Ever yours faithfully |T.H. Huxley | [To] Albany Hancock Esq

HP 17.286 AIC

Albany Hancock to Thomas Henry Huxley, 19 July 1856 HH26

SUMMARY

Hancock gives Huxley some preliminary results of his brachiopod work. He concludes that there is no anus and that the sexes are not separate. He also discusses the vascular system in some detail. He agrees to Huxley's suggestion that he should send his paper on the brachiopods to the Royal Society when it is ready.

TRANSCRIPTION

[286]

St Mary's Terrace – Newcastle upon Tyne

19th July 1856

My dear Sir

Accept my best thanks for the Rhynconella. I am thankful for any Brachiopod at this moment, as my stock is rapidly disappearing, many of the specimens having turned out bad. Most of Mr McAndrew's are in a soft state; three or four of his were quite useless, and all I have opened have had the mantle more or less injured. This made me anxious to get hold of Belcher's specimens. I mentioned Belcher's name to Mr Davidson, but did not state the reason, and he thought, I suppose, that Mr McAndrew's would do, and so applied to yourself[?] Moreover his specimens have the ovaries in an early state of development. It may therefore be desirable to see other

[287 L]

individuals taken at a different season.

The [taxon?] that you were so kind as to send me have been of the greatest service; and your offer to send more I scarcely know how to accept or how to refuse, for I am really ashamed to trespass so much on your kindness. But I must frankly confess that another specimen or two might enable me to complete my investigation of the vascular system. –

And now as to progress: I am quite prepared to state, as you have already stated, that there is *no* anus in Rhynconella and Waldheimia [?]; neither is there any in [??] nor in [?? probably genus and species names in both cases]. Rhynconella completely settled the matter. Had I dissected this originally I should never have hesitated. – I have seen in any instance the aperture at the apices

[287 R]

of the so-called hearts, and they always present the same appearance. It would therefore be absurd to hesitate longer on this matter. These organs cannot be hearts, and I am still inclined to the opinion that they are oviducts – Prof Owen thought that they were renal organs; but is it a fact that any such organ is really tubular, with one end opening into the visceral chamber and the other externally? –

I have paid much attention to the pyriform vesicles described by you and find that the "ridges" are *vessels* connecting them together, and that vessels run from them along the membrane that suspends the ovaries. A vessel also passes backwards into the pedicle, and another, larger than the rest, extends along the dorsal ridge of the stomach, and enters the vesicle, appended to that [?], in front.

['287b' – Diagram page (labelled 283 in ICA)]

[Layout of page: Piece of text at top is a continuation of text at bottom. In between top and bottom text, most of page is taken up with a large drawing labelled with the letters *a* to *i*. The top and bottom pieces of text are essentially a caption for the drawing.]

[Bottom text:]

a, heart; b,b,b,b, accessory pulsating vesicle; cccccc, pallial or ovarian arteries; d, artery apparently supplying alimentary tube and pedicle; e, vessel by which the blood is returned to the heart; ff, vessels situated at the base of the cirri; g, tubercle probably perforated to admit the blood from the X

[X is used here (bottom right corner of page) to connect the text with its continuation at top left corner of page (where there is also an X mark)]

[Top text:]

X visceral chamber; h, sinuses between the wall of the oesophagus and sheath; i, orifices by which the marginal vessels communicate with the visceral chamber. – j, vessels coming from beneath the sheath.

[288 L]

It can scarcely be doubted that in these vesicles and vessels we see the *true vascular system*. The central vesicle is the heart, only a little more highly developed than that of the ascidian: its walls are muscular. The vessels leading from it backwards are arteries, and the vessel coming to it along the middle line of the stomach must bring the blood from the aerating surface. By what path it reaches this channel I have not yet ascertained. But do not despair of determining this part, if my specimens

only hold out. The vesicles of which there are pairs situated close to the ovaries are undoubtedly accessory pulsating organs.

I have seen nothing yet to warrant the belief that in these animals the sexes are divided. Indeed I find that the ovaries are composed of two substances, one is oviperous, the other I think will probably prove to be

[288 R]

the male [?] organ. I have not yet found spermatozoa; but in Lingula I have seen what I take to be spermatophores in an individual that contained an ovary.

I should have much pleasure in sending my paper to the Royal Society; but I had not thought of doing so, as you informed me some time ago, that communications of a more general character were looked upon with greater approbation. I could have no objection, however, if you think a memoir on the anatomy of the Brachiopods would be acceptable. I intend in the meantime to send a short account to the Br. Ass; stating little more than results – And afterwards, I had imagined, to forward full details to the 'Annals' or some other similar publication

[289 L]

which gives illustrations. I have made a great number of drawings, a selection from which I think ought to be published along with the paper. –

Has anyone described the nervous system more fully than Owen? His account of it is very imperfect, and in many respects erroneous. –

Yours ever truly | Albany Hancock | [To] T.H. Huxley Esq

PS The muscular system also requires some correction –

NEWHM: 2017.H64.13

Thomas Henry Huxley to Albany Hancock (mid July 1856; probably between 16th and 20th) HH27

SUMMARY

This is just the second part of a letter. Sheet 1 does not seem to be the NHSN collection. The following sheet includes more discussion of molluscan and brachiopod anatomy; also some advice from Huxley to Hancock on the best way to title papers for Philosophical Transactions. Huxley then refers back to this advice in his letter dated 24th July 1856 (see below). This back-referral allows approximate dating of this orphaned sheet.

TRANSCRIPTION

it seems quite probable that they may be portions of a rudimentary lacunal vascular system – the blood being poured from the ventricles into the thickness of the [?] & then making its way through the mesentery & 'bands' to the intestinal [?] – possibly getting a kick from the pyriform vesicle as it goes along & eventually passing by the genital bands into the venous sinuses –

This view would be in agreement with [?] late investigations into the relation of the papillae which enter the canals of the shell in Waldheimia to the sinuses of the mouth. Whether it will stand further investigation has to be seen

[p2]

As you say however all depends upon the existence or non-existence of the apertures –

I think that the urinary organs of Lamellibranchs have been well made out as the 'organ of [?]', an organ whose relations are essentially similar with those of the sacculated 'venous appendages' in Cephalopods – The [?] of the [??] then is inceptional – but does occur, in [taxon?] for instance – the late discovery of Gegenbaur & Leuckart that the urinary sac in Heteropoda & Pteropoda communicates directly with the blood sinus system – a fact which I had overlooked in my

[p3]

examination of these animals – would remove any difficulty which the wide opening of the 'heart' into the visceral sinus might give rise to. However, I confess, I still cling to the old interpretation of the organs –

With regard to your communication on the existence of a new organ of special sense in the Bullidae – I think I must say that we should be very glad to have it for the Proceedings – we grant woodcuts but it is very advisable – that they should be as simple & as few as possible

Will you permit me to make a suggestion about papers for the Transactions? It is this – that it is very advisable to have their scope as *general* as possible

[p4]

Papers on special points – e.g. the anatomical details of a single genus or single family are not well looked upon unless their anatomy be considered in a general point of view – and it is always advisable to let the titles of the papers express their generality of treatment – Thus if I were going to send a paper about the points we have been discussing I would not call it ‘On the anatomy of Rhynchonella psittacea’ but on ‘The general structure of the Brachiopoda as illustrated by...’ or something of that kind – and I would make the contents answer to the title –

It is just as well to know of the existence of these prejudices though I think I may say we should be glad to have a paper from you under any title –

Ever yours | faithfully | T.H. Huxley | [To] Albany Hancock Esq

NEWHM: 2017.H64.14

Thomas Henry Huxley to Albany Hancock, 23 July 1856 HH28

TRANSCRIPTION

Jermyn S. July 23rd 1856

My dear Sir

I have but just received your letter which however may have been laying here for a day or two – I am as you may imagine exceedingly pleased to hear of your results – and I have just been digging among my "marine stack" to find you some more material

[p2]

By this post you will receive a bottle containing some of the fixed Waldheimias I could pick out and a single Rhynchonella which appears hitherto to have escaped my notice – I hope that they will all be in good preservation

[p3]

It is close upon [?] time so I reserve further remarks for another opportunity

Ever yours faithfully | T.H. Huxley | [To] Albany Hancock Esq | Please direct henceforward to my private home | 14 Waverley Place | St John's Wood

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NEWHM: 2017.H64.15

Thomas Henry Huxley to Albany Hancock, 24 July 1856 HH29

SUMMARY

Huxley continues the dialogue between the two men on the interpretation of anatomical features in molluscs, brachiopods and ascidians. Here the main focus is on structures called 'hearts'. Huxley proposes alternative hypotheses for what these are. He then goes on to urge Hancock to publish his 'memoir' in Philosophical Transactions of the Royal Society; and offers to present it for him.

TRANSCRIPTION

14 Waverley Place, St John's Wood

July 24th 1856

My dear Sir

Now for the other points contained in your letter – I cannot tell you where [???] specimens are or who has them – probably Mr Lovell Reeve would know but pray don't tell him that I suggested the inquiry or your obtaining any specimens will not be facilitated –

Where my own specimens came from I don't know but they belonged at one time to Forbes

[p2]

I still think it possible that the "hearts" may be renal organs though perhaps they may serve as oviducts as well – it is certainly an established fact that the renal organs in the Pteropoda Heteropoda & some Nudibranchs open into the perivisceral cavity or into the pericardium which communicates with it – as well as externally and furthermore in many Lamellibranchs the genitalia also open into the renal cavity

[p3]

I am inclined to think that the communication of the renal organ by an internal opening with the perivisceral cavity will be found to be universal among the Mollusca

There is however another hypothesis which long ago occurred to me as plausible – with regard to the "hearts" viz that they are the openings of a sort of cloacal cavity – analogous to that of the ascidians – and that what

[p4]

we call the visceral cavity is in fact a cloacal cavity lined by a membrane like (the atrial membrane of ascidians) – which forms the different bands which I described connecting the alimentary canal with

the [?] and encloses all the viscera – If you dissect a common *Ascidea (Phalluria) intestinalis* [probably the species now known as *Ciona intestinalis*] you will see how the intestine and the heart are included & pinned down by sacs formed by this "atrial" membrane – the heart being included in a sac of its own (just as you

[p5, new sheet]

suppose to be the case in the Brachiopoda) – and the vascular sinuses lying between the [?] of the body and the atrial membrane – However, there would be difficulties in applying this hypothesis to *Lingula*

I do not think that anyone has described the nervous system more fully than Owen and in his first papers he makes a terrible mess of it – The last description which he published was I believe merely an account of a dissection of Goadby's

[p6]

Have you examined the minute structure of the muscles? You will I believe find that some are composed of striated and some of non-striated fibres –

Let me urge upon you by all means to publish your memoir in the Philosophical Transactions – you will then have as many illustrations as you please and all well done and on any scale you may prefer–

I look upon this memoir of yours as of a general character inasmuch as it deals with a whole group – and

[p7]

has much philosophical importance – What I said or meant to say before was that I thought objection might be taken to mere anatomical details without a general bearing, unless they referred to something quite new –

I forget at this moment whether you are an FRS or not (at any rate you ought to be) but if not it would give me real pleasure to present your paper & take charge of it –

Ever My dear Sir | Faithfully yours | T.H. Huxley | [To] Albany Hancock Esq

HP 17.289 AIC

Albany Hancock to Thomas Henry Huxley, 27 July 1856 HH30

SUMMARY

Hancock thanks Huxley for the brachiopod specimens he sent. There are then some points about brachiopod anatomy and its interpretation. Hancock also thanks Huxley for offering to present his paper at the Royal Society – but he also says that there is much work still to be done and the paper will not be ready for a while.

TRANSCRIPTION

[289 R]

St Mary's Terrace – Newcastle upon Tyne

27th July 1856

My dear Sir

I am indeed greatly indebted to you for this ample supply of Brachiopods which you have so kindly sent me. I shall certainly now be able to work out all necessary details, - at least I shall do my best to arrive at so desirable a [?]. I have already dissolved the shell of one of the specimens and find it in excellent order. In this I shall endeavour to inject the vascular system, though I am not by any means confident of success, - the parts are so delicate. –

I was not aware that in any of the nudibranchs the renal organ opens either into the perivisceral

[290 L]

cavity or into the pericardium. In Doris this is certainly not the case but from the arrangement of the parts and from their delicacy it might easily be imagined to communicate with the latter. And I apprehend imagination does not infrequently take the place of fact in these [?] and difficult matters. Witness the Brachiopods, nevertheless I do not intend to dispute your opinion in regard to the renal character of the pseudo-hearts of these animals, especially as you are disposed to admit that they may also act as oviducts – Indeed I rather incline to this opinion; and have mentioned your suggestion on the subject in the short account intended for the Br. Ass: Should you, however, have any objection to my doing so please drop me a line to this effect, and

[290 R]

I will strike out the passage. –

Your hypothesis with regard to the cloacal nature of the visceral chamber is rather startling and is worthy of consideration, though I think it can scarcely be so.

I have not yet examined the [?] structure of the muscles but intend doing so. Some of the muscles are richly supplied with nerves.

Of course, after what you say, I shall be well pleased to have any paper published in the Phil. Trans. and feel greatly obliged by your kind offer to take charge of it. It will be some time before I can have it ready, as I wish to make it as complete as possible. –

Thanking you once more for your supply of Brachiopods. I am –

My dear Sir | yours truly | Albany Hancock | [To] T.H. Huxley Esq

NEWHM: 2017.H64.16

Thomas Henry Huxley to Albany Hancock, 30 July 1856 HH31

SUMMARY

This letter continues the discussion of anatomy in molluscs, brachiopods and ascidians, again with a focus on the nature of the 'hearts'. It seems that Huxley favours an interpretation of these as renal organs, but stresses that this is just a hypothesis. He also says he is glad that Hancock has decided to submit his memoir to the Royal Society.

TRANSCRIPTION

14 Waverley Place

St John's Wood

July 30th 1856

My dear Sir

I am very glad the specimens reached you safely and in good condition – and that you have made up your mind to hand your memoir to the Royal. It is on all accounts by far the best place –

About the internal anatomy of the Renal organs. You are aware that in the Heteropoda and Pteropoda the kidney is a contractile sac placed close to the heart and having an external aperture – You will find figures of it in my paper on the Cephalous Mollusca

[p2]

Now I did not observe the internal opening of the renal sac communicating with the pericardium, in my Heteropods & Pteropods – but two excellent German observers – Gegenbaur and Leuckart – have discovered the existence of this aperture, by which the cavity of the renal sac is placed in free communication with the so-called pericardium (which is as you know nothing but a blood sinus) – in a great many Plecopods and Heteropods

Leuckart further found it in Phylliroe and Gegenbaur in Polycera but I am not

[p3]

aware that it has hitherto been noticed in any other nudibranch – last year however I observed it in a minute transparent species of Eolis – whose species I have not yet determined by your book (a little fellow no more than 3/16 of an inch long with four large & two small posterior dorsal papillae, adult because the generation organs have developed) Here is my note on the subject: "Between the intestine and the pericardium there lies a pyriform contractile sac like that in Firola – the walls are colourless

and [?] with large oval cell like bodies. Its lower and anterior extremity is rounded; its upper posterior gradually narrowed to a

[p4]

neck which becomes lost close to the anus. Near the lower part of the neck a short canal lined with very large cilia whose apices were directed towards the interior of the sac connected it with the cavity of the pericardium"

[diagram[1]]

I assure you that imagination had no scope here as I took particular pains to verify this factor – and I make[?] no doubt that the observations of Gegenbaur & Leydig are quite correct

You will find them in "Siebold & Kolockers Zeitschrift fur Wiss. Zoologie 1853" and in Leuckarts ZoologischeUntersuchungen Rep 3 1854.

Pray make any use you please of any suggestion of mine

[p5, sheet 2]

always remembering however that anything with reference to the nature of the "hearts" must be rather a suggestion than an opinion at present –

It is precisely in that way that I threw out the notion of the cloacal nature of the visceral opening – What has always puzzled me about the Brachiopoda is the manner in which the alimentary canal is included within a sort of sheath and attached to the [?] instead of being free as in all of the Mollusks

And if all the bands etc[?] are vessels – then the [?] difference from ordinary Mollusks

[p6]

becomes still greater – while the resemblance to the wall of the atrium of an ascidian would become still greater. Indeed the more I compare the structure of Phalluria with that of Waldheimia the more I am struck with the resemblance of the so-called visceral cavity to the cloaca or rather atrium – I place two diagrams for comparison on the next page having altered Phalluria in no essential particular except elongating the mantle lobes at the anterior part of the branchial & posterior part of the cloacal aperture –

[p7, starts with diagram labelled with a-k]

a anterior lobe of mantle b tentacle c mouth d ganglion e cloacal apertures [?] in embryo Phalluria f posterior fold of mantle g oesophagus h stomach i intestine k [=j?] anus or end of rectum k heart

The shaded spaces = vascular tissues

The white spaces – ramifications of the atrium – under which head the so-called sinuses of the mantle in Brachiopoda would come – The pencil line indicates the section of the atrial membrane the ink line the viscera & [?]

[p8]

Pardon my troubling you at so much length with this matter – but I am sure you will see that it is well worthy of consideration – I believe nothing is so useful as an hypothesis if you make it your slave & not your master

I am My dear Sir | Ever yours faithfully | T.H. Huxley

PS. I leave England for a month on Monday or Tuesday

Note 1: Two roughly sketched drawings of molluscan anatomy are side by side here

HP 17.291 AIC

Albany Hancock to Thomas Henry Huxley, 14 Sept 1856 HH32

SUMMARY

Here, Hancock goes through various points of the anatomy of molluscs (especially nudibranchs), brachiopods, tunicates and bryozoans. Importantly, he says that the latter three groups should be placed in a category separate from the rest of the Mollusca.

TRANSCRIPTION

[291]

St Mary's Terrace – Newcastle upon Tyne

14th Sept 1856

My dear Sir

Supposing that you must have returned to England by this time I sit down to reply to your interesting communication of the 30th of July. I did not write on the receipt of it as I could not do so in time for my letter to reach you before you left for the Continent.

First, with respect to the renal organ, it appears to me that the two organs are confounded. I paid great attention to this matter when my eye [was] upon Doris. In this genus the large sinus which we have described as the kidney certainly opens externally, - at least such was our determination after a most careful examination. But this is not a pulsating organ, neither does it open into the pericardium. The pyriform vesicle which we have called a portal heart, I cannot doubt pulsates, but on the other

[292 L]

hand it has no external orifice. The blood which it receives is conveyed by a large vessel into the liver and kidney. It is this really and what we have called the renal organ that I think are confounded by anatomists who have examined the subject only by transmitted light. The renal organ and portal heart are so placed in respect to each other that had it been possible to examine Doris in this way, they would, in all probability, have been have been looked upon as one organ communicating with the pericardium and opening externally. In Polycera these two organs are exactly as in Doris, and in Tritonia and Eolis the portal heart is easily observed on laying open the dorsal skin. I have detached this organ likewise in Antiopa and [?taxon]. –

From your note on the renal organ of Doris I think you have seen both the true kidney and portal heart. I would suggest that the large sac rounded in front and tapering behind is the former and the neck or short canal lined

[292 R]

with very large cilia is probably the latter. I can easily conceive that these organs in Doris seen as transparent bodies would have very much the appearance of your representation.

Now since the countless blunders committed by [? Author] in his papers on the Nudibranchs I must confess that I put little faith in observations made entirely by transmitted light. Consequently I feel reluctant to give up our view of the matter until someone shall have proved that we are wrong by the actual dissection of such an animal, for instance, as Doris.

I am still working away at the Brachiopods and have lately been thinking over your ingenious suggestion as to the dorsal character of the visceral chamber; but I cannot exactly reconcile myself to the idea that a cavity for the mere passage of water should be turned into a blood sinus. It would seem just as likely that the excrescent chamber of the Lamellibranchs should become a reservoir for the blood.

[293 L]

Moreover the atrium of the Ascidian is a development in consequence of the peculiar character of the breathing apparatus. Therefore when this peculiar character no longer exists we should expect that the atrium would also disappear. Surely then we should not look for its greatest development in the Brachiopods. – For these and a few other reasons I cannot help doubting your notion, though I must examine further before coming to anything like an opinion; and in the meantime would suggest another explanation upon which I should like to have your opinion. But first of all what is the true nature of the test of an ascidian? This has always appeared to me to be something more than the shell of the mollusc. Does it not really represent both the shell and the mantle? I am inclined to think it does – 1st because it is *not* related to the outer tunic / the supposed mantle / as the shell and the mantle are related to each other; 2nd, because no shell receives arteries

[293 R]

as the test does; 3rd the epithelial lining indicates the presence of something more than a mere shell; 4th the test makes its appearance in the embryo before the outer tunic which should not be the case were one the shell, the other the mantle. If this view be correct with regard to the test, then the outer tunic of the ascidian is to be accounted for in the Brachiopod; and what I would suggest is that in the latter it has closed on the viscera and formed the peculiar sheath to the alimentary tube, likewise the several parietal bands; - that it is, indeed, what has been demonstrated as the peritoneum in the higher molluscs. And it is interesting to see how between this sheath and the wall of the oesophagus sinuses are formed from which the blood is returned to the heart much in the same way as it may be supposed to be returned to the heart of the ascidian from the sinuses within the outer tunic. Thus it would seem that the spaces between the walls of the viscera and the sheath can exactly

[294]

distinguish the Brachiopoda as well as the Ascidia and Bryozoa from other molluscs by the respiratory organ being in connection with the alimentary system; and when we look at the whole anatomy of these animals it would seem desirable to place them in group apart from the rest of the Mollusca.

I have also observed another interesting fact, and that is that the cirsi are arranged in a *double* series, although Owen distinctly states that there is only a *single* series. I have likewise something to say

about the muscles of the anus. With respect to the double spiral described by Owen you are quite correct when you state there is no such arrangement, and that he must have mistaken the spiral blood channels for muscles –

Pardon my troubling you with this long and tedious letter, and believe me,

Yours truly | Albany Hancock | [To] T.H. Huxley Esq.

HP 17.295 AIC

Albany Hancock to Thomas Henry Huxley, 9 Oct 1856 HH33

SUMMARY

Hancock discusses various aspects of the anatomy of molluscs, brachiopods and tunicates. He raises issues about possible correspondence between the tunicate test and the mollusc mantle and shell. He also mentions the vascular system and asks if Huxley has looked at his (previous) diagram of this system. He also notes that the use of reflected light is often better than transmitted in microscopy.

TRANSCRIPTION

[295]

St Mary's Terrace – Newcastle upon Tyne

9th Oct 1856

My dear Sir

Many thanks for your last, long and obliging letter, which I have refrained from answering until I had had an opportunity of reading your article on [?] organs in Todd's Cyclopaedia. I had previously perused the article on the Tunicata by Rupert Jones in the same work and now find that I had placed too much reliance on some rather careless expressions therein. As for instance he speaks of *arteries* going to the test, I was thus induced to infer that the blood must necessarily escape from them, and on its return to the centre would pass into the spaces between the test and outer tunic. So it is clear enough how necessary it is to look for oneself, and certainly I shall

[296 L]

examine an Ascidian or two, as I have always intended to do, before drawing up my memoir. –

From what you say it would appear, that in our present state of knowledge, the test must be looked upon as the homologue of the shell of the Mollusk. I am not, however, quite satisfied with your explanation regarding the development and the epithelial lining of the test; though I readily admit that further examination may justify your conclusions on both these points. –

From this you will perceive that I am quite prepared to throw overboard my suggestion with respect to the intestinal sheath; and I at once admit that there is nothing left me, but to adopt your proposition; which as I acquire a better insight into the structure of the Ascidians appears to me all the more likely.

But after considering the matter

[296 R]

attentively it does not seem necessary to assume that the perivisceral space is at all cloacal in character. It may be that the inner tunic might sheath the viscera and line this space and its prolongations, and that the atrium might be altogether atrophied, there being no longer any necessity for an excurrent chamber. And indeed I should not be surprised to find this tunic more extensively developed in the Ascidians than is at present believed – In the Brachiopods however is it not probable that the pseudo-hearts are the homologues of the atrium? –

I cannot think that the inner tunic is equal to the inner lining of the Brachiopods and Lamellibranchs. So far as the mantle of the [?] is concerned it is apparently equivalent only to the lining membrane of the pallial sinuses. This, I think, can be proved by the number of layers composing the

[297 L]

pallial lobe.

I find that the caeca penetrating the shell have nothing to do with the aeration of the blood, nor do they appear to belong to the blood system at all. They do not communicate with the network of blood channels in the mantle, their proximal extremities not penetrating the outer layer of that organ. – I don't know what to make of them unless they are for the purpose of maintaining a state of low vitality in the shell so that injuries sustained may be repaired. They have a very gland-like appearance. It may be that they have something to do with the growth of the shell. And yet it is difficult to conceive how this can be; for I entirely agree with you respecting the growth of shell, and have always thought that Carpenter was wrong – I satisfied myself on the matter years ago; but the intimate connection between the mantle and shell in the Brachiopod may perhaps signify some modification

[297 R]

of the law. –

Have you at all considered the diagram I sent you of the vascular system? It would seem likely that the blood will oscillate as in the Ascidians; but nothing except an examination of the animal in a living state can set this interesting question at rest. –

You seem scarcely to have understood what I meant respecting observations made with transmitted light. I would not for a moment call in question the efficacy of the microscope and observations made with it in this manner. I constantly use it in this way and indeed who does not? – What I meant was that this mode of observation is *more* liable to error than that by reflected light; and that it is dangerous, in complicated subjects, to rely entirely on observations so made. – Consequently I had more faith in the one mode than in the

[298 L]

other. –

The dull weather has greatly retarded my progress, and when I shall be ready for the Royal Society I really cannot say. I am hurrying on as quickly as I can, and should like to know when my paper should be in your hands – The more time I have, the more complete will it be –

I am, my dear Sir | yours sincerely | Albany Hancock | [To] T.H. Huxley Esq

HP 17.298 AIC

Albany Hancock to Thomas Henry Huxley, 26 Oct 1856 HH34

SUMMARY

This letter has more on the anatomy of tunicates, brachiopods and molluscs, with particular reference to the test, the vascular system, sinuses, and genitalia. Hancock here emphasises that he now agree with many of Huxley's interpretations. He says he hopes to have his brachiopod paper ready for the Royal Society before the end of the year (1856).

TRANSCRIPTION

[298 R]

St Mary's Terrace

Newcastle upon Tyne

26th Oct 1856

My dear Sir,

I now find that I have confounded the third and inner tunics together, [?] supposing that the walls of the alimentary canal could be called a tunic. This is certainly a misnomer. I have also erroneously imagined that the cloaca and atrium were coextensive, and that these terms were convertible; hence much of the misunderstanding that exists between us. My present opinion is that the equivalent of what you call the third tunic in the Ascidian, in the Brachiopod sheaths the alimentary canal and probably the muscles, and lines the walls of the body and great pallial sinuses, but I do not see the necessity for considering the space (perivisceral) thus enclosed to be homologically equal to the

[299 L]

cloaca, which I think was your original notion, and is perhaps so still. It appears to me that the cloaca of the Ascidian is either entirely atrophied in the Brachiopod or is represented by the pseudo-hearts. This is what I meant to say in my last letter, only from ignorance I used the term atrium instead of cloaca. I now restate the matter – that you may see how far our notions agree at this moment.

I perfectly agree with you that the mantle of the Brachiopod and Lamellibranch is nothing more than a process of the parietes of the body. What I said on this point was in reply to a passage in your letter to the effect "that the 3rd tunic of the Ascidian or lining of the atrium is equal to the inner layer of the mantle". I now see that I mistook what you meant by the "inner layer" of the mantle, and that in reality we both meant the same thing. –

As for your second "[?]" I can go to some length with you at once. The

[299 R]

great pallial sinuses are certainly nothing more than prolongations of the atrium; they do not communicate with the arteries nor with the minute net-work of sinuses; neither do the arteries themselves open into the marginal vessel. Yet am I of opinion that the perivisceral space and great pallial sinuses are connected with the circulation of the blood. My observations lead me to the conclusion that the blood passes from the arteries into the net-work of blood channels between the layers of the mantle, and that these channels communicate with the marginal vessel which opens into the perivisceral space. Thus this space becomes a portion of the circulatory apparatus, and it is from this arrangement that I suppose it likely that the blood current may oscillate to relieve this great blood sinus. – That it is a blood sinus is proved by the large pallial sinuses having frequently filled with coagulated blood; and I think I can demonstrate also that it communicates with the parietal blood channels as I have just

[300 L]

said. Here is a section of a portion of the mantle, by which you will be enabled to see more clearly what I mean. –

[At this point, text continues on LHS of page; **diagram** is on RHS.]

I suppose from your remarks that you are inclined to look upon the marginal vessel, as well as the great pallial sinuses, as a mere prolongation of the perivisceral space, cut off from the blood circulation. This I have stated above is not so; and moreover the great pallial sinuses do not appear to open into the vessel as is generally supposed.

[300 R]

On the contrary they seem to me to terminate in caecal extremities before they reach the vessel, and I shall have to represent them so unless I obtain further light on the subject before concluding my investigations. Now I should like to know from you if you can gainsay this or if you consider that anyone has demonstrated the connection between the sinuses and the marginal vessel. Owen says something about it; but I am not disposed to place much reliance on his evidence in this matter, -

With regard to the supposed perforated tubercles which I mentioned I have no great confidence in them myself, and unless I can ascertain anything more about them I shall lay no stress on this supposition. –

The genitalia do not appear to me to lie in the wall of the atrium as represented in your diagram. – It ought, I think, to be

[**300b L]**

represented thus. –

[two small **diagrams** here]

It is difficult to say, however, whether the genitalia are in the walls of the Atrium or not; but I think they must, for they are enveloped in an epithelium which is apparently continuous with that of the Atrium or lining membrane of the sinus. –

It is also worthy of remark that that portion of the membrane to which the ovaries are attached is decidedly muscular; so that those pallial sinuses can be greatly compressed, and the fluid therein contained forced into the perivisceral

[300b R]

cavity. Thus perhaps aiding in the circulation of the blood. –

I shall endeavour to be ready for the Royal Society before the close of the year –

I am, | My dear Sir, | very sincerely yours | Albany Hancock | [To] T.H. Huxley Esq.

HP 17.301 AIC

Albany Hancock to Thomas Henry Huxley, 25 March 1857 HH35

TRANSCRIPTION

[301]

St Mary's Terrace – Newcastle upon Tyne

25th March 1857

My dear Sir,

I doubt you will think me, by this time, a very negligent fellow. I write however to state that I am not so in reality, however appearances may be against me. I have been working very hard ever since I last wrote, and have done my best to keep my promise to you; the time has nevertheless passed by and I still find myself at work –

The dissections, I am happy to say are all finished, the

[302 L]

draft of the paper is complete and there is very little more to do than to copy it. You may therefore calculate upon receiving it in the course of a few days. I will make every exertion to forward it with as little delay as possible. –

There is much to correct in Lingula; - there are no branchial loops, such as described by Cuvier and Owen; and the nerves of the latter are blood channels –

I am, my dear Sir | yours truly | Albany Hancock | [To] T.H. Huxley Esq

NEWHM: 2017.H64.17

Thomas Henry Huxley to Albany Hancock, 29 March 1857 HH36

TRANSCRIPTION

14 Waverley Place St J. Wood N.W.

March 29th 1857

My dear Sir

I was on the eve of writing to you that the "Ides of March were past" when your note came – I shall welcome your paper [?] warmly whenever it comes and once more the sooner the better.

[p2]

Do you never come to town? I would offer you a bed if you do not mind a small room & my wife & myself would be very glad to see you

Ever yours faithfully | T.H. Huxley | [To] Albany Hancock Esq

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HP 17.302 AIC

Albany Hancock to Thomas Henry Huxley, 18 April 1857 HH37

SUMMARY

Hancock finally sends Huxley the brachiopod paper for the Royal Society's Transactions – the paper he had previously promised to send before the end of 1856. He mentions that he has made about 250 drawings and that the paper will require some 8-10 plates.

TRANSCRIPTION

[302 R]

St Mary's Terrace – Newcastle upon Tyne

18th April 1857

My dear Sir,

I forward to your address by this day's post my much delayed paper on the Brachiopods. It is a long story, and I am afraid will weary the members of the Royal Society, who may be so unfortunate as to be present at the meeting. It is full of details; but I hope only such as are necessary to the elucidation of the subject; and I think that you will find it satisfactory.

Before you let it pop out of your hands, I should be glad if you would refer to pages 2 and 3, where your paper published in the "Proceedings" is alluded to; and also

[303 L]

to page 113 where the tunics of the Ascidiae are mentioned. And if I should have in any way mis-understood you please make the necessary corrections before I commit myself. You will see that I have availed myself of the assistance you so kindly afforded me. –

I hope also that you will let me know, as soon as you can, the day fixed for the reading, [so] that I may, if possible, send up some of the illustrative figures. I think that I shall require 8 or 10 plates. I have made about 250 drawings. Of course only a few of these can be used; but my materials are so extensive, and I think so interesting, that it would be a pity

[303 R]

not to give copious illustrations. I shall set to work at once with them; and until they are finished, I am afraid that I shall not be able to attend to the Abstract of the paper, which you stated, some time ago, should be ready for the "Proceedings". –

I have just got Vogt's paper translated, and I now find that he has made a sad mess of the so-called gills and mantle. Had I been aware of this in time, I would have pointed out his errors; but all I can do now is to add a note to the end of the paper, should it be deemed necessary to make special allusion to his investigations. Perhaps you

[304]

will let me know your opinion.

And now, allow me to thank you for taking charge of my paper; and also for your very kind offer of a bed. I go, however, so rarely from home that I cannot, at this moment look forward to the time when I shall again have the pleasure of visiting the metropolis. –

I am, | My dear Sir, | yours truly, | Albany Hancock | [To] T. H. Huxley Esq

NEWHM: 2017.H64.18

Thomas Henry Huxley to Albany Hancock, 20 April 1857 HH38

SUMMARY

This letter acknowledges receipt of Hancock's memoir for publication by the Royal Society (in Philosophical Transactions). Huxley also gives Hancock some advice in relation to the paper, for example that he should include all necessary illustrations.

TRANSCRIPTION

14 Waverley Place, St John's Wood N.W.

April 20th 1857

My dear Sir

I write a hasty note to say that your memoir reached me this morning – a hasty glance over its contents has sufficed to show me that it is long since so valuable a contribution has been

[p2]

made to Malacology – but on this point I will write you more at length when I have had time to read the paper as it deserves to be read

I will immediately write to D Sharkey & find out when the paper can be read

I would certainly add

[p3]

the note of which you speak about Vogt's work. He is a clever fellow but I fear to use old Cardinal Granville's favourite expression "a friend of smoke"

Don't spare a single necessary illustration – the Royal is very good in this respect and I cannot imagine any difficulty will be made whatever you send us.

Ever yours very faithfully | T.H. Huxley | [To] Albany Hancock Esq

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NEWHM: 2017.H64.19

Thomas Henry Huxley to Albany Hancock, 8 May 1857 HH39

SUMMARY

Here Huxley informs Hancock that his paper will be read (by Huxley) at the Royal Society the following Thursday (14 May 1857). Huxley says that he will write a brief abstract of the paper to be read out, but that Hancock should either correct Huxley's version or make his own for the published version.

TRANSCRIPTION

Friday May 8th 1857

14 Waverley Place

St John's Wood

My dear Sir

It was arranged yesterday evening that your paper should be read next week (Thursday) at the Royal

Can you let me have

[p2]

any of your plates by that time – say on Wednesday?

I have been making an abstract of your paper which is nearly complete for my own use and if you have had no time to make one – this can if you like, be read

There will I fear be

[p3]

no time to send it to you beforehand but you shall at any rate have it before it is printed so as to make any amount of alteration you please (of course it would be better if you can supply one yourself)

I am more & more pleased with your memoir & I find only 3 points on which I should have a criticism or two to offer

[p4]

The first is your adopting "dorsal" & "ventral" for the [? & ?] valves when they seem to me to be in reality both dorsal.

2.) I do not think your adductors in Lingula can be the homologues of the adductors in Waldheimia from the entirely different relations of the muscle to the [?]-parietal bands in the 2nd case.

3.) I have my doubts as to whether your "testis" in Lingula is one & whether Owen's nerves are not really nerves inclosed in sinuses

In haste | Ever yours | T.H. Huxley

HP 17.305 AIC

Albany Hancock to Thomas Henry Huxley, 13 May 1857 HH40

SUMMARY

Hancock states that his paper will require 15 plates, not just the 8 to 10 he suggested previously. He thanks Huxley for producing an abstract. And he addresses Huxley's three points of criticism of his paper.

TRANSCRIPTION

[305]

St Mary's Terrace – Newcastle upon Tyne

13th May 1857

My dear Sir,

I dispatched to you by yesterday evening's post drawings for 3 plates to illustrate my paper; and I am sorry that I had not more ready to send ; but I find that they take more time than I calculated upon, and that instead of 8 or 10, the material cannot be squeezed into less than 15 plates. I am alarmed at the number and scarcely know what you gentlemen of the Royal Society may say to this enormous demand. I will prepare them nevertheless, and when you see them, if you think

[306 L]

there are more figures than necessary, you can make a selection.

With the drawings you will find explanations of the figures; they were drawn up hastily and require revision and are not in a fit state to be put into the hands of the printer. Be so kind as to return them therefore after the paper has been read. –

I am well pleased that you have made an Abstract of the paper and gladly accept your kind offer of it for the use of the meeting. I have no doubt that it is more to the purpose than any I could have made, as you are practically acquainted with what, in such cases, is required. –

I am much gratified that you are pleased with the paper, and

[306 R]

that you find so little in it to criticize. With respect to the position of the valves, it is clear enough that they may both be looked upon as dorsal, but if so those of the Lamellibranchs must also be dorsal; the only difference being that whilst in the latter they are united along the *longitudinal* centre, in the former they are joined *across* the back. –

Your objection as to the adjusters in Lingula is formidable; but perhaps when we know something of the development of these animals the difficulty may be explained away. And in the meantime it must not be forgotten that the ilio-parietal bands in this form are something more than they are in the [?taxon]: in connection with them the genitalia are developed. And the invagination

[307 L]

of the peduncle has very much disturbed the arrangement of the parts of the [?] region in the latter.

If I am wrong respecting the testis in Lingula, it may be asked what are the vesicles which I have described as spermatophores? I cannot make anything else of them. Another dissection or two will settle the matter as to Owen's nerves; they are certainly blood channels, and if they carry nerves, so does the Branchio-systemic vein which is not at all likely: - the appearances of the two are exactly the same. –

Can I be permitted to add a note to the paper as it is passing through the proofs regarding Vogt's memoir? I am not yet in possession of the *entire* translation and it is desirable to make one note suffice –

Yours truly | Albany Hancock

NEWHM: 2017.H64.20

Thomas Henry Huxley to Albany Hancock, 18 May 1857 HH41

SUMMARY

Huxley informs Hancock that his memoir was read at the Royal Society on Thursday. Huxley also notes that he considers the shell valves in brachiopods and bivalve molluscs to be different in their alignment with the rest of the body (now known to be true). And he encourages Hancock to produce memoirs on other groups of molluscs.

TRANSCRIPTION

14 Waverley Place, St John's Wood

May 18th 1857

My dear Sir

The abstract of your memoir was read on Thursday evening. Owen was present but he had not the generosity or good feeling to make a single remark either in acknowledgement of his own mistakes – or of the high value of your researches – But I expected nothing else from him –

[p2]

Your plates arrived in time & are very beautiful – I am a little appalled at the number, but nevertheless *do not spare yourself a single illustration that you think in any way desirable* – It shall go hard with me if they are not published; and at any rate if there is any real opposition (which I do not much fear) we can but make a selection after all –

I have always regarded the valve of the Lamellibranchiata as dorsal & I have been in the habit

[p3]

of pointing out the difference between the Lamellib & Brachiopod shell – though both are bivalves – based on the especial direction of the hinge with relation to the axes of the body in both –

I have taken but a hasty look at the bodies you describe as spermatophores but they are [?] like peculiar fusiform muscular bands which I have often met with in ascidians – and whose nature greatly puzzled me at first – I am strongly inclined to think your 'testis' in Lingula a renal organ & that these bodies are muscular bundles extending from wall to wall

[p4]

You can add any note you like to your memoir – it should be dated and strictly speaking I believe any addition requires the permission of the Council – but don't trouble yourself about that [???] & the printing then becomes the Secretary's responsibility.

I heartily wish you would make up your mind to work out a series of memoirs on each great division of the Mollusca in the same style as this & the Mem on Doris –

We are badly in want of a new "Memoires sur les Mollusques" and I know of no man so competent to give us one as yourself – Pray think of it. Materials might be got together & help from [?] if you would only undertake such a task

Ever yours faithfully | T.H. Huxley

NEWHM: 2017.H64.21

Thomas Henry Huxley to Albany Hancock, 25 June1857 HH42

TRANSCRIPTION

14 Waverly Place St John's Wood

June 25th

[No year given; but from the context it is1857]

My dear Sir

I send the proof of the abstract of your paper which has just reached me – It is very desirable to make as few corrections as possible as they want to get this part of the Proceedings out without delay – so I hope you will find nothing worse than verbal errors

[p2]

Please do send the proof back as soon as possible delivered to

D. Sharpey

33 Woburn Place

E.C.

London

Ever yours very faithfully | T.H. Huxley

NEWHM: 2017.H64.22

Thomas Henry Huxley to Albany Hancock, 10 July 1857 HH43

TRANSCRIPTION

Govt School of Mines, Jermyn St

July 10th 1857

My dear Sir

I have been looking out lately for the memoir on the Brachiopoda but it has not made its appearance – Let me beg you to send it as soon as possible as it is high time it should be given in to the Society

[p2]

Ever yours faithfully | T.H. Huxley | [To] Albany Hancock Esq

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NEWHM: 2017.H64.23

Thomas Henry Huxley to Albany Hancock, 18 July 1857 HH44

TRANSCRIPTION

14 Waverley Place, St John's Wood

London

July 18 1857 [March is crossed out and July written in above it]

My dear Sir

I am delighted with the [?] you give me – Pray let me have the paper as soon as possible and I will complain about the illustrations – Make the paper just as long as you think fit – the Physicists

[p2]

and Mathematicians think nothing of taking up half a part of the Transactions so why should we be modest?

It will be well to prepare an abstract embodying the chief points of your paper to be printed in the Proceedings

Ever yours faithfully | T.H. Huxley | [To] Albany Hancock Esq

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HP 17.307 AIC

Albany Hancock to Thomas Henry Huxley, 13 Sept 1857 HH45

TRANSCRIPTION

[307 R]

Rock Lodge – Sunderland

13th Sept 1857

My dear Sir,

I did not receive your note of the 9th Inst until yesterday afternoon, and the date of this, in reply to it, will not a little surprise you. When I last wrote I fully expected to visit the South; but circumstances have unfortunately kept me in the North, and I now no longer expect to see London this year; nor do I know when I shall

[308 L]

have that pleasure. Allow me however to thanks you for your kind invitation, and to express my regret at having thus [?] from accepting it. –

I have, as stated in my last, nine plates for the paper on the Brachiopods ready. Shall I send them at once; or keep them until the remaining three are finished? The whole could be forwarded by the end of October, and this I should prefer doing to sending them in two batches. –

Awaiting your reply | I am, | My dear Sir | Yours truly | Albany Hancock | [To] T.H. Huxley Esq.

[308 R]

Address as above

NEWHM: 2017.H64.24

Thomas Henry Huxley to Albany Hancock, 17 May 1858 HH46

SUMMARY

Huxley congratulates Hancock on the completion of his major paper on the brachiopods and gives him several names of people to whom he thinks it should be sent.

TRANSCRIPTION

14 Waverley Place

May 17th [no year given, but it is 1858 from the context]

My dear Sir

Let me congratulate you on having ended your long travail at last – the separate copies, for which accept my very best thanks, reached me yesterday –

[p2]

Let me recommend you to send copies to Goodsir[?] & Allman in Edinburgh, to Milne Edwards, [?] & [?] in Paris, to Lacaze-Duthiers in Lille, to Kolicker in Wurzburg, Leuckhart in Giessen, Victor [?] in Leipsic, Von Siebald in Munich, to Agassiz, [? & ?] in the United

[p3]

States –

If any other names occur to me I will let you know

I am glad you are working at the Lamellibranchia. The communication of their renal cavity with the pericardium on the one hand & the arteries on the other has been thoroughly worked out by [?]

[p4]

in a recent valuable paper on the Circulatory System of [taxon?] in the Transactions of the Vienna Academy –

It is most desirable to have it confirmed however in this & other Lamellibranch Mollusks

Two friends of mine Dr Rothestone[?] & Mr Robertson have lately endeavoured to show that the so called

[p5]

oviducts of [?] are in reality parts of a water-vascular system.

There is no doubt about their facts, as I have seen their preparations

Have you seen Lacaze Duthiers paper in [?]?I have a shrewd suspicion that what he describes as a blood

[p6]

vascular system is simply a water vascular system after the fashion of that in the Brachiopods or that I have described in Nautilus

Ever yours very faithfully | T.H. Huxley | [To] Albany Hancock Esq

NEWHM: 2017.H64.25

Thomas Henry Huxley to Albany Hancock, 5 Nov 1858 HH47

SUMMARY

Huxley reveals that the Royal Society has awarded a medal to Hancock (not yet released officially) and congratulates him.

TRANSCRIPTION

Jermyn S. Nov 5th 1858

My dear Sir

I believe I am committing a very irregular act as no one has any business to know what takes place at the Council Meetings of the Royal Society except the members of the Council but as I *do* know – I really

[p2]

cannot refrain from offering you my very hearty congratulations on the award of the Royal Medal – an honour you have so well earned –

I may explain now the reason why I urged you so strongly to complete your memoir

[p3]

last year was because the point was then under discussion – but it was thought better to wait until your beautiful memoir on the Brachiopoda was before the Society.

I trust we shall at any rate meet this year

Believe me| Very faithfully yours | T.H. Huxley | [To] Albany Hancock Esq

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HP 17.309 AIC

Albany Hancock to Thomas Henry Huxley, 7 Nov 1858 HH48

SUMMARY

Hancock thanks Huxley for his congratulations on (unofficially at this stage) being awarded the Royal Medal. He seems somewhat overwhelmed by the award. Also, he asks Huxley if he would provide a testimonial for Mr Alder to help him obtain a small pension from the government, since he lost 'everything he had' due to the failure of a Newcastle bank.

TRANSCRIPTION

[309]

St Mary's Terrace, Newcastle on Tyne

Nov 7th / [18]58

My dear Sir,

Accept my best thanks for your kind letter and congratulations, which have however not a little alarmed me. – I in no way calculated on such an honor as you announce; and indeed do not feel conscious of meriting it. It is nevertheless very gratifying to learn that the little I have done in the furtherance of knowledge has been deemed worthy of so high a mark of approbation.

I suppose the presentation

[310 L]

of the medal is a simple affair, and will require no effort on my part, for I am quite a novice in such matters. I hope also that the award of this honor can in no way be considered to affect Mr Alder's reputation, who is my senior and is the principal in the [?] of the chief works upon which I have been engaged. –

With respect to my friend I may take this opportunity of asking a favour of you, which I have intended doing for the last two or three days; - you are perhaps aware that he has

[310 R]

lost almost everything he had by the failure of a Bank in this town, in which he was unfortunately a shareholder. Now his friends are anxious to obtain for him a small pension from government. Can you give him a testimonial that will be of service to him? We wish to induce the Duke of Northumberland to use his influence with Lord Derby, - and we think we should be able to do so if we could show his

Grace three or four testimonials of undoubted authority. The testimonial might also be used as laying the

[311 L]

matter before the Premier. –

If you can comply with this request perhaps the letter had better be addressed to Mr Alder. –

Hoping to hear from you soon on this subject, I am,

My dear Sir | Yours ever truly | Albany Hancock | [To] T.H. Huxley Esq.

HP 17.311 AIC

Albany Hancock to Thomas Henry Huxley, 8 Nov 1858 HH49

TRANSCRIPTION

[311 R]

St Mary's Terrace – Newcastle on Tyne

Nov 8th / [18]58

My dear Sir,

I have received this morning a letter from Dr Sharpey announcing the award of the Royal Medal and intimating that it will be conferred on the 30th November, when it is hoped that I will be able to be present to receive the same. –

Now unfortunately I am so situated at present that I cannot leave at this time without the greatest inconvenience.

[312 L]

And I now trouble you for the purpose of asking your opinion as to the necessity of my presence in London. If my absence should have the appearance of indifference to the honour dear me I should come up however inconvenient it might be; for I would rather suffer in this way to any degree than be accused of such insensibility. Will you kindly give me your opinion at your earliest convenience, and confer a favour upon

Yours truly | Albany Hancock | [To] T.H. Huxley Esq.

NEWHM: 2017.H64.26

Thomas Henry Huxley to Albany Hancock, 10 Nov 1858 HH50

SUMMARY

Huxley advises Hancock to be present at the Royal Society for the award of his (Hancock's) medal, advice which subsequent letters show Hancock did not take, probably owing to a shy disposition.

TRANSCRIPTION

Jermyn S Nov 10th 1858

My dear Sir

I should certainly advise you, if possible, to be present when your medal is awarded and at the anniversary dinner subsequently – (i.e. the same evening) –

Of course there is no absolute necessity in the matter – but it is usually done out of respect to the Society

[p2]

[?] Edward came over from Paris to receive the Copley Medal

With respect to the matters you mention in your preceding note – the award is I fancy (though I am not altogether behind the scenes) made for your *anatomical* researches

No one would for a moment depreciate the value of Mr Alder's labours but if I mistake not they

[p3]

do not lie in this direction

I am heartily sorry to hear of Mr Alder's misfortune and I shall be glad to do anything in my power to help him – The proper form of testimonial will however require a little consideration and I think I had better [?] it to you as I have not had the pleasure of knowing Mr Alder personally

Ever yours very faithfully | T.H. Huxley | [To] Albany Hancock Esq

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NEWHM: 2017.H64.27

Thomas Henry Huxley to Albany Hancock, 17 Nov 1858 HH51

TRANSCRIPTION

Jermyn S Nov 17 1858

My dear Sir

I feel great delicacy in troubling you upon a subject on which I have already given my opinion but a note from one of the officers of the Royal Society which lies before

[p2]

me begs me to urge you to come up[1] on the 30th *if possible* –

I feel it my duty to pass on the message at the risk of your thinking me very officious

Ever yours very faithfully | T.H. Huxley | [To] Albany Hancock Esq

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Note 1: Meaning 'come up to London on 30th November 1858' (to receive his medal)

HP 17.312 AIC

Albany Hancock to Thomas Henry Huxley, 18 Nov 1858 HH52

SUMMARY

Here, Hancock states that he cannot come to London to receive his Royal Medal, despite two letters from Huxley urging him to do so. He describes the prospect of coming to London at this point in time as 'quite impracticable'. This is almost certainly a way of saying that his socially-nervous and retiring disposition will not let him. He asks if Huxley would be prepared to collect the medal on his behalf.

TRANSCRIPTION

[312 R]

St Mary's Terrace, Newcastle upon Tyne

Nov 18th / [18]58

My dear Sir,

I am greatly obliged to you for your letter of the 10th Inst: and however glad I should have been to follow your advice I find that my coming to London at this moment is quite impracticable. I must therefore give up all notion of personally receiving the medal, and can only hope that my absence will not be attributed to any want of respect to the Royal Society nor to indifference to the high honor done me by

[313 L]

that distinguished body.

And now may I ask of you a favour to add to the many I have already experienced at your hands. Will you be so kind as to receive the medal for me? Should you however have any objection do not hesitate to say so, and my friend Dr Embleton who is to be in town in the course of a few days will undertake this service. –

He will do himself the pleasure of calling upon you shortly after his arrival, and would be much gratified if

[313 R]

You could obtain for him the privilege of attending the anniversary meeting as he is very anxious to be present. He has himself offered to bring the medal to the north on his return.

I shall write immediately to Dr Sharpey informing him that either you or Dr Embleton will receive the medal; and shall be very glad to have a line from you to say if you can do me this kindness. –

I am, My dear Sir, | Yours truly | Albany Hancock | [To] T.H. Huxley Esq. (over)

[314 L]

P.S. I was just about to dispatch this letter when your last communication arrived; and it is now with increased regret that I send it off. I should have been most happy had I been able to act upon your kind advice; but I find it quite impossible to do so. It seems unnecessary to explain further, and I can only thank you for the great kindness you have evinced in this matter. –

A. H. | Nov. 21 / [18]58

NEWHM: 2017.H64.28

Thomas Henry Huxley to Albany Hancock, 2 Dec 1858 HH53

SUMMARY

After a reassurance to Hancock that his Royal Society medal is safe in Huxley's hands (which shows that Hancock did not go to London to collect it in person), Huxley advises Hancock on a possible course of future study, apparently in response to a request from Hancock made via an intermediary, namely Hancock's friend Dr Embleton. Huxley advocates a plan in which a comparative anatomy of all animal groups is built up in a hierarchical way. And he urges Hancock to take on this task for all the major groups of molluscs, saying that he is the best person for the job.

TRANSCRIPTION

Jermyn S Dec 2 1858

My dear Sir

I was so thoroughly unwell on Tuesday evening and so occupied yesterday afternoon that I omitted to inform you that your medals are safe in my hands and can be forwarded to you in any way you think best – I made my best bow in your place & expressed the regret you felt at your unavoidable absence

[p2]

I had the pleasure of seeing Dr Embleton on Monday and he told me that you would like to have my opinion as to the direction your future work should take – In such matters so much depends on every man's idiosyncracy, that it is difficult to advise; and if I frankly tell you what I think – you must bear in mind that it is with the reservation that after all you yourself are the head judge of what you should undertake –

[p3]

In my view then what we want above all things throughout the animal kingdom, is a series of thorough & exhaustive monographs – upon the structure of those animals which may be regarded as the types of their orders –

Sound morphology – whose establishment is or ought to be the aim of every scientific anatomist, will only become possible when we have such a thorough knowledge of all the leading varieties of animal form – that we can compare them together point by point

[p4]

and then determine in what respects they agree & in what they differ – The study of these relations combined with that of development is the only sound basis of homologies and unless these are speedily determined, anatomy & zoology will come to a standstill –

Any man who should attempt to dissect through the animal kingdom or any subkingdom – in this style – by going straight through and examining every animal would of course undertake a ridiculously impossible task – And it would be at the same time a very unnecessary labour for

[p5, new sheet]

his object might be just as well obtained by a far less expenditure of time and trouble – For inasmuch as the organization of any group is always sufficiently represented by that of some one or other form in that group, which may be taken as a type it is obviously sufficient to determine the structure of that type & to regard the other forms as modifications of it –

This is what I want to see done in all divisions of the animal kingdom and you of all men are the one to do it for the Mollusca

[p6]

The Cephalopoda are represented by say Ommastrephes & Nautilus

The Pulmonata by Helix

The Pteropoda by [taxon?] ?

The dioecious gasteropods by Buccinum

The monoecious gasteropods by [Doris and Eolis crossed out and replaced with ‘done’]

The Lamellibranchiata by Anodonta

The Brachiopoda by [Terebratula & Lingula crossed out and replaced with ‘done’]

The Ascidioida by Phallusia

The Polyzoa by Bugula

[p7]

Perhaps the forms I have selected may not be the best types – but they illustrate what I mean – which is that if we had monographs up to the present state of science on these dozen animals – worked out by one person in reference not only to anatomical details but to broad morphological views – we should have an imperishable basis for the scientific study of the Mollusca

The types of the orders having been worked out it would be time to begin again and work out the types of the families – These finished – the typical species of the genera might follow & so on to any extent of subdivision –

[p8]

The advantage of this plan is that it is at once comprehensive in plan & monographic in detail. The benefit to Natural History which would accrue from working it out is in my judgement incalculable –

You might well execute one monograph in a year – I entertain not the slightest doubt that the Royal Society would be glad to publish them as successive papers. So far as material is concerned there is no great difficulty in obtaining all the animals – and as an earnest – I place at your disposal a pearly Nautilus in my possession – of course you will understand that I shall only be most glad to help you in every way in my power

Ever yours very faithfully | T.H. Huxley

HP 17.314 AIC

Albany Hancock to Thomas Henry Huxley, 7 Dec 1858 HH54

SUMMARY

Hancock thanks Huxley for collecting his medal and asks if he would post it to him. Then he addresses Huxley's suggestions as to what research work he (Hancock) might do next. He applauds Huxley's scheme, says that something of the sort had crossed his mind, but also says that the endeavour seems enormous. So he will confine himself to the question of which group to do next, and says that he has decided upon the bivalve molluscs.

TRANSCRIPTION

[314 R]

St Mary's Terrace, Newcastle upon Tyne

Dec 7th / [18]58

My dear Sir,

Before making any reply to your long and interesting letter, for which I am greatly obliged, allow me to thank you for your kind services in receiving the medal for me; - And I am sorry to give you still more trouble in this matter, but I have now to ask you to be so good as to forward it to me through the post which, I think

[315 L]

is the best way. It had better be registered, though I grieve to put you to this inconvenience. And if it be necessary to have a box made to protect it I shall most gladly remit you the cost, likewise the charge for registration etc in postage stamps: -

I perfectly agree with all you say as to the best mode of following up my anatomical researches. Your plan is most comprehensive, and though it would take many years to work it through, even in its broadest features, it is the readiest and most concise manner of treating the subject.

[315 R]

A similar plan was floating in my mind, and I feel not a little strengthened and confirmed by your opinion. The task however seems so enormous that I dare scarcely contemplate it as a whole. Circumstances may arise, in the course of years, which might compel me to desist from such pursuits altogether.

I therefore do not like to commit myself to any very lengthened undertaking. Of course whatever is done, is so much done towards this very desirable consummation, and so without contemplating the whole achievement I can regulate my future doings by

[316 L]

this scheme, each paper being complete in itself. –

I think I shall take up the Lamellibranchs next. I have long wished to examine the structure of these animals, and the lower forms appear to me the best to take first.

Mya arenaria I think of taking as the type, but it would also be necessary to look to some of the Mononyaries, and one or two other forms. But before entering upon this I would like to do something with the material I have collected on the anatomy of the Tectibranchiata. I have worked out the details of

[316 R]

this group with much care; and while the subject is still fresh in my mind it would be well to conclude it. If it be allowed to rest for years many details will escape my memory, and consequently neither the illustrations nor the descriptions would be so full and exact as I can make them now. –

You once told me that you thought a paper on this subject was scarcely the right thing for the Royal Society. Do you think the Zoological Society would undertake it with good plates? But perhaps the 'Annals' would do all that was necessary. –

[317 L]

My best thanks are due to you for your kind offer of the pearly Nautilus, and when the time arrives I shall most gladly avail myself of your kindness. In the meantime it had better remain in your hands. I cannot undertake anything for a few months, and then I should prefer beginning with the Lamellibranchs. After them I might take up either the Cephalopoda or Pulmonata –

With many thanks for your kind advice I am

My dear Sir | yours ever truly | Albany Hancock | [To] T.H. Huxley Esq

NEWHM: 2017.H64.29

Thomas Henry Huxley to Albany Hancock, 15 Dec 1858 HH55

TRANSCRIPTION

Jermyn S Dec 15 1858

My dear Sir

I have but just this to say that I packed up your medals yesterday as lightly & safely as possible intending to send them by post – But as I find they weigh lb 1 & ¾ and will consequently cost you between five & six shillings

[p2]

in postage registration I thought I had better inform you of this fact before sending them and give you your option of having them this way or in some more economical manner

Please to let me know what I am to do

Ever yours faithfully | T.H. Huxley | [To] Albany Hancock Esq

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HP 17.317 AIC

Albany Hancock to Thomas Henry Huxley, 12 August 1860 HH56

SUMMARY

Hancock informs Huxley that he has made a good start on the cephalopods. But he is short of specimens and asks Huxley if he can supply some. He reports his progress to date which is largely to do with the circulatory system. And he asks Huxley if he knows of any recent publications on this group of molluscs.

TRANSCRIPTION

[317 R]

St Mary's Terrace, Newcastle on Tyne

12th August 1860

My dear Sir,

For the last three months I have been struggling with the Cephalopods and have so far overcome them as to be induced to state the progress I have made and to solicit the aid which you once kindly tendered.

The great difficulty is with regard to specimens. – I have had one Octopus, one Eledone and several of Loligo [?] – a species so small that I cannot wrest from it the requisite details, and these too, that is the specimens, are all nearly exhausted. Have you any of the Cephalopods that you can spare and don't care to have them cut to pieces in the

[318 L]

pursuit of knowledge?

I have applied to all my friends and the fishermen in this neighbourhood without success, and unless you can help me in my difficulty I shall soon be hard aground.

I boldly make this application as you once were kind enough to say that you would endeavour to assist me with specimens should I go on with my dissections of these Mollusca.

I have already accumulated considerable details, and have made out several points which appear to have hitherto escaped observation – One of these relates to what has been called the fleshy stalk of the gill. This I find to be a gland with a sort of portal circulation. A large branch of

[318 R]

the portal vein enters this organ and gives off twigs which immediately resolve themselves into a series of capillaries. The blood is then collected again into trunks which open into the branchial artery. This gland has no duct. –

The so-called water system, which has occupied much of my attention, is divided into two portions – one, the pseudo-pericardium, - the other forming the capsule of the testis or ovary. – In Loligo the latter, which contains likewise the heart, stomach, and gizzard, opens into the former. In Octopus this capsule communicates with two small chambers in which lie the fleshy appendages attached to the branchial hearts. – These appendages in Loligo also directly communicate with the great water cavity or genital capsule. –

[319 L]

Now it appears to me, at present, that *no* water is taken into these cavities except that which may find its way there through the vascular system, and that these fleshy appendages are propelling organs and are the medium of communication between the blood system and the so-called water system. – They are hollow organs communicating on the one hand with the interior of the branchial hearts, and on the other with the chamber in which they are placed. Thus it would appear that some portion of the fluids that escape from the [?] of some of these organs during the act of nutrition is again taken into circulation.

And here perhaps we have the

[319 R]

most rudimentary condition of an absorbent system. Be this however as it may, it is a very interesting fact, and well deserves a thorough investigation. – Nautilus and Sepia are stated to be deficient in the fleshy appendages; consequently something may be found in these forms to illustrate this point. – You have I believe observed some peculiarity in this respect in the former. – Where did your remarks appear? –

Have any recent papers been published on the anatomy of these animals; and which do you consider the best memoirs on the subject? Seibald's, I suppose, is as good as any. – Does Owen's last edition of his comparative

[320 L]

anatomy give a fair epitome of what is known on these matters. –

Pardon the trouble I am giving you, and believe me to be

Yours very truly | Albany Hancock | [To] Prof. T.H. Huxley

HP 17.320 AIC

Albany Hancock to Thomas Henry Huxley, 28 August 1860 HH57

SUMMARY

Hancock thanks Huxley for his paper on Nautilus. He then makes some points about the circulatory system of cephalopods, including the 'co-called' water system. He ends by asking Huxley about the latter's papers on tunicates – but this seems to be largely for the benefit of Mr Alder, who is cataloguing tunicates for the British Museum.

TRANSCRIPTION

[320 R]

St Mary's Terrace, Newcastle on Tyne

28th August 1860

My dear Sir,

Accept my best thanks for the copy of your paper on Nautilus which I had not before seen; also for the information your letter contains.

I have read with much interest your remarks on Nautilus, and suppose the fifth chamber you describe to be the same as Owen's "general abdominal cavity", which according to him communicates with the vena cava, and is consequently a blood receptacle – Is this so? If such blood receptacle

[321 L]

really exists the blood system of this animal must resemble that of Octopus, which has, according to Mr Edwards, an abdominal blood chamber; though it has much the character veritable blood sinus with proper walls, formed by the expansion of those of a branch, or branches of the vena cava; - at least the walls of the chamber are continuous with those of the veins which open into it. –

You rather misunderstand what I meant to say about the nature of the so-called water system. – In the higher Cephalopods the external openings of the "pericardial" cavity are perfectly

[321 R]

obvious – so much so that they may be observed at a hard gallop. – But still I see no reason for supposing that the surrounding element is consequently admitted. It appears to me that in the higher Mollusca this system of chambers is for the purpose of collecting the redundant fluids, and for throwing them out of the system. – I cannot see the necessity for water entering at the "pericardial" orifices; though it is very easy to imagine that soft aquatic animals like the Mollusca may require

some special apparatus for the purpose of ejecting water which may be supposed to permeate all the tissues in large quantities. –

I now find that I have still

[322 L]

something to learn about the fleshy appendages of the branchial hearts – It may be that they are secreting organs similar to those appended to the branchial arteries; but from what I have observed in Octopus they are more likely for the purpose of absorption. –

I should like to know at your leisure where your paper or papers on the Ascidians were published. – Mr Alder is at present engaged on a Catalogue of the Br. Species for the Br. Museum and he is anxious to refer to what you have done on the subject. – I have the memoir that appeared in the Phil. Trans.

Yours ever truly | Albany Hancock | [To] T.H. Huxley Esq.

HP 17.322 AIC

Albany Hancock to Thomas Henry Huxley, 7 Sept 1861 HH58

SUMMARY

This is a brief discussion of body fluids (blood/lymph/chyle) and the vessels through with they run (veins/lacteals). The taxonomic scope is unclear, but includes cuttlefish.

TRANSCRIPTION

[322 R]

St Mary's Terrace, Newcastle on Tyne

7th Sept. 1861. –

My dear Sir,

I am glad to find that you see so little to criticize in my paper, and have to thank you for your remarks.

With regard to the lymphatic nature of the cardiac appendages I meant to express myself cautiously, for certainly I did not consider the matter "proven" – I fear however from what you say that some of my expressions require modifying a little. – I will look to this when I have the proofs –

I was aware that the veins

[323 L]

as well as the lacteals are concerned in the absorption of the nutritive matters; but I believe it is usually stated that the fluids are principally taken up by the former and the chyle proper by the lacteals. – Another reason for my dwelling on the fact that the absorption is effected by the veins was that Mr Edwards states in the "[??? title unclear]" that it is no longer necessary to look for any special apparatus for the absorption of the chyle; his theory being that it will at once find its way into the circulation by the aid of the visceral lacunae. Now this cannot be the case in the Cuttlefish. And I wished to show that the idea of venous absorption was

[323 R]

sufficient without any special apparatus for the purpose. –

I am greatly obliged for your kind offer to apply to the Government Grant Committee for aid to procure specimens. – The truth is I do find the "expense troublesome" small as it is, and shall be glad if you will make the proposed application; particularly as you say it can be done with propriety - £10 I should think amply sufficient for the purpose.

I am, | My dear Sir | Yours ever truly | Albany Hancock | [To] Prof T. H. Huxley

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NEWHM: 2017.H64.30

Thomas Henry Huxley to Albany Hancock, 25 Oct 1861 HH59

TRANSCRIPTION

26 Abbey Place

St John's Wood

Oct 25 1861

My dear Sir

I am very glad to be able to inform you that the Council of the Royal Society yesterday placed £15.0.0 at your disposal for the

[p2]

purchase of specimens which you require in pursuing your researches on the Cephalopoda

I found it would be an easier & shorter process to obtain this money from the Donation Fund of the Society than from the Government Fund

[p3]

If this should not be enough, I imagine there will be no difficulty in getting more – and I shall always be glad, as you know, to act in this or any other way that may aid your investigations

On application to the Treasurer you will

[p4]

obtain a cheque for this amount

Ever my dear Sir | Faithfully yours |T.H. Huxley | [To] Albany Hancock Esq

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NEWHM: 2017.H64.31

Thomas Henry Huxley to Albany Hancock, 12 May 1864 HH60

TRANSCRIPTION

[No address or date here; at end instead]

My dear Sir

Your excellent memoir has reached me in safety & I meant to have written to you about it at length today – but I have been incessantly interrupted until now I shall only be able just to save [=catch?] the post

[p2]

If you think well I will send the paper to the Linnean – not because it is not good enough for the Royal but because I know the Linnean wants good papers & will gladly illustrate your work well –

I am greatly struck with your idea about

[p3]

the function of the different parts & not having time to write put a diagrammatic parallel

[Diagram here – 2 in fact – LH & RH – label Doris (genus) at top left.]

In haste

Yours faithfully | T.H. Huxley | Jermyn S | May 12th 1864

NEWHM: 2017.H64.32

Thomas Henry Huxley to Albany Hancock, Nov/Dec 1865 HH61

[No date or address at top, though the Geological Survey 'stamp' is there; so is end of letter. The date must be in 1865, almost certainly November or early December]

SUMMARY

This is the first letter on fossil vertebrates. Huxley mentions that he will be in Bradford in December, and says that he would be inclined to come to Newcastle if he could see the fossil specimens.

TRANSCRIPTION

My dear Sir

The [?] of Mr Howse's discoveries in the Permian which have appeared in the 'Annals' is extremely interesting to me for reasons which will be obvious to you if you will look at the enclosed abstract

[p2]

It would mean [last 3 words uncertain] a good deal to see these same reptilian remains and to get Mr Howse to send us papers about them to the Geological Society –

But I am mindful of our [last 2 words not clear] conversation after supper at Sir William Accurby's[?] – when you all declared that we Londoners were no better than we should be

[p3]

and I am alarmed at the thought of making any proposition to Mr Howse himself – least he regard it as an insidious attempt at a scientific raid –

So I appeal to you to be intercessor & bail, for me with Mr Howse – I am coming to Bradford to give a lecture in Christmas week – and I am greatly inclined

[p4]

to extend my travel to Newcastle – if Mr Howse will let me look at his specimen – But I do not want to make the request, if he is not as well assured as you would be under like circumstances, that I by no means want to meddle with the work which he is so excellently competent to do and that any information I can give him will be absolutely [?] for his own use – If I could persuade him to give us a paper at the Geological on the whole subject - & so heal the breach

[back to top of page 1]

between North & South I should [?] myself [?] happy

Pray [?] my respects to your brother & sister

Ever yours | T.H. Huxley

HP 17.324 AIC

Albany Hancock to Thomas Henry Huxley, 15 Dec 1865 HH62

SUMMARY

This letter is about fossil reptiles that Hancock and Mr Howse have, and expresses a wish that Huxley would indeed (as Huxley had suggested in his previous letter) extend a forthcoming Bradford trip as far as Newcastle to see the specimens.

TRANSCRIPTION

[324]

St Mary's Terrace – Newcastle on Tyne

15th Dec. 1865

My dear Sir,

Your letter came to hand just as I was finishing a drawing of the new Permian Reptile, to illustrate a paper which Mr Howse and I are preparing, and which we had determined to send to you for advice, and to be laid before the Geological Society if you thought proper, and this notwithstanding the disjunction of the "North and South". – It was therefore with much pleasure that I learn that there is a prospect

[325 L]

of your visiting Newcastle during Christmas week. – And I can assure you that both Mr Howse and myself will have the greatest pleasure in laying whatever we have before you, whether Reptilian or Piscine or of what nature soever the things may be that interest you. –

All the three recently acquired Reptiles are at present in my hands. – One is a fine little fellow about 7 inches long, with three of its limbs stretched out, one of the forelegs being quite perfect

[325 R]

even to the claws. – The vertebrae are not well displayed; but the ribs lie on either side in regular order. – This is similar to Protorosaurus, but requires further examination. – The second specimen is also apparently a Protorosaurus; but is much larger than the former. The vertebrae of this one are well preserved; there is however little else than vertebrae and ribs. –

The new species is curled up, the head lying along the ventral margin – the tail is absent, it is about 15 inches long just as it lies – The vertebrae are larger; but all character is

[326 L]

obliterated on account of the unfortunate crystalline condition of the specimen – There are upwards of 20 ribs disposed in regular order, one after the other. The head is large, and is seen in section; it is wide and truncated behind and narrows forward to form, apparently, a blunt snout. The bone, however, is in so bad a state that it will be difficult, if not impossible, to determine any of its characters. – The most remarkable feature is the bony scutes or scales with which it is covered from end to end; they extend diagonally across the body

[326 R]

giving to the entire surface a ridged appearance. They are 1 ¾ inches long and 5/8th inch wide, and have a long articulating process at one end; they are striated [?] lengthwise.

[Small diagram here (not labelled)]

They resemble much the scales of Platysomus. – The limbs are not preserved. –

From the characters of the scales and head this Reptile may perhaps be related to Goniopholis of the [?] beds. –

I have also at present the teeth of three of the specimens of Janassa in my possession; these are very instructive

[327 L]

and as the dealer says, well worth inspection. I can assure you also a sight of two examples of Dorypterus, and the photograph of another. –

Now I hope from what I have said that you will be induced to extend your travels from Bradford to Newcastle. – Please let me know as soon as possible your determination and on what day we may expect you. My sister and brother unite with our kind regards –

Yours ever truly | Albany Hancock | [To] T.H. Huxley Esq.

NEWHM: 2017.H64.33

Thomas Henry Huxley to Albany Hancock, 15 Dec 1865 HH63

TRANSCRIPTION

[No address or date here; at end instead]

My dear Sir

Many thanks for your very kind & most interesting letter. The work Mr Howse & you are doing just now is wonderfully interesting & I shall be most glad – if my horn-lantern can shed the least light on your path.

I lecture at Bradford

[p2]

on the 28th and I shall venture to get from there to Newcastle somehow & somewhen on the 29th – But it will probably be late & I shall therefore put up at my hotel and come to you fresh & with a great appetite for Saurians as soon after breakfast

[p3]

on the 30th as you care to have me –

I will bring [Author name's] book on the Protosauria of Germany with me & take a look at the College specimen (old [?] original discovery) again so as to have it fresh in my mind

Let me have a line from you to say when

[p4]

I may make my appearance on the morning of the 30th

& believe me | Ever yours faithfully | T.H. Huxley | Jermyn S | Dec. 15th 1865

HP 17.327 AIC

Albany Hancock to Thomas Henry Huxley, 20 Dec 1865 HH64

TRANSCRIPTION

[327 R]

St Mary's Terrace Newcastle upon Tyne

20th Dec 1865

My dear Sir,

I am very much pleased to learn that you have determined to visit Newcastle on the 30th Inst. – We shall be ready to receive you at 10 a.m. or as soon after as convenient. – In the meantime we are availing

[328 L]

ourselves of the skilful manipulation of our friend Mr Athey to have the specimens fully displayed before you arrive.

I forget whether I mentioned in my last that we think the large specimen is related to Goniopholis – The general outline of the head, so far as it can be seen, resembles that of Teleosauria –

Yours ever truly | Albany Hancock | [To] Prof T.H. Huxley –

NEWHM: 2017.H64.34

Thomas Henry Huxley to Albany Hancock, 9 April 1867 HH65

TRANSCRIPTION

Jermyn S

April 9th 1867

My dear Sir

Always consider me your London agent in scientific business –

I shall always be glad to take charge of any papers of yours & do [my] very best to have them disposed of in accordance with your wishes – and

[p2]

accordingly I shall be on the lookout for your communication to the Linnean –

I was very grieved to hear some time ago that you had been seriously indisposed – but I sincerely trust that the fine summer one may reasonably

[p3]

hope for, after all these storms, will thoroughly restore you –

Pray do not think of returning the grant – if you do the work any time these ten years you will have perfectly fulfilled the conditions under which it was made

Ever yours very faithfully |T.H. Huxley | [To] Albany Hancock Esq

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NEWHM: 2017.H64.35

Thomas Henry Huxley to Albany Hancock, 23 April 1867 HH66

TRANSCRIPTION

April 23rd 1867 [no address here or at end]

My dear Sir

I write a hurried line to announce the safe arrival of your MS & paper for which I thank you very much

I am off tomorrow morning for a week to

[p2]

Brittany – but when I return I will at once attend to your paper –

I am seriously behind hand in all Invertebrate matters just now & I shall simply have to learn from it

Ever yours faithfully | T.H. Huxley

NEWHM: 2017.H64.36

Thomas Henry Huxley to Albany Hancock, 7 June 1870 HH67

SUMMARY

This letter contains some discussion of different interpretations of the anatomy fossil vertebrates. Huxley says that he disagrees with Hancock's (and Howse's) interpretations so much that he has decided to delay the reading of their paper (at the Linnean) until the matter is resolved.

TRANSCRIPTION

[address and date are at end]

My dear Sir

Your & Mr Howse's papers are to be read tomorrow – so I sent for them on Saturday in order to go over the specimens with them as I promised you I would yesterday – Including yesterday being Whit Monday my assistant was away, and he had put the Dorypterus away so carefully that I could not find the specimens – Hence

[p2]

it is only this morning that I have had the opportunity of studying them carefully –

After going over them with [?] pains I find that I differ from you so completely as to the interpretation of the "sigmoid rods or plates" that I am going to take upon myself the responsibility of stopping the reading of your paper till I have heard from you – There is another meeting so no harm will be done if you still wish that it should go in in its present form; and then I am prepared

[p3]

for any amount of scolding if you think I have done wrong –

I have not a doubt that the real interpretation of the bony structure of the hinder half of the body is this

[Diagram labelled with a to d, and with Hancock's j and m]

j & m are your letters for the sigmoid

[p4]

ossicles & intermedials [or could be intermediates] folding [or could be patching] integument. But I think the plates I have coloured yellow to be [??] dermal plates with the edges flanged & projecting towards the eye thus

[small diagram labelled with j and m]

and j is neither more nor less than matrix – retained underneath flanged edges. The whole affair then becomes intelligible

Strike but hear! [what does this mean?] I am in an immense hurry & can add no more at present

Ever yours faithfully | T.H. Huxley | Jermyn S | June 7th 1870

NEWHM: 2017.H64.37

Thomas Henry Huxley to Albany Hancock, 18 June 1870 HH68

TRANSCRIPTION

[address and date at end]

My dear Sir

I have not been able to talk to Mr Dallas, the Acad. Secretary of the Geological Society about your papers until today – As always happens in the last evening of the Session, a considerable number of papers will have to be read on Wednesday

[p2]

and, consequently, each paper will have to be read very briefly.

So we propose to read an abstract of yours, referring only to those points about which there is no doubt; and the paper itself can be modified as you think but afterwards in those parts which are not referred to –

[p3]

This proceeding will save time as we are close upon the vacation

I think I could make the point about the sigmoidal plates & the rods clear, if we were looking at the specimens together

The bony plates which lie between the [?] spines are median companions of the latter, just as are found in the Pycnodonts

Whatever the dentition

[p4]

of Dorypterus it is to all intents & purposes a Pycnodont in its general structure –

I am very glad you approve of the course I have taken about the paper: it is rather awkward to act for any one else in such matters

Ever yours faithfully | T.H. Huxley | Jermyn S | June 18th 1870

HP 17.328 AIC

Albany Hancock to Thomas Henry Huxley, 24 June 1870 HH69

SUMMARY

Hancock highlights five problems he has in accepting Huxley's interpretations of the anatomy of Dorypterus (a fossil fish). He seems keen to accept Huxley's view but cannot as yet; so he is essentially asking Huxley for clarification.

TRANSCRIPTION

[328 R]

St Mary's Terrace, Newcastle upon Tyne

24th June 1870

My dear Sir,

We are much obliged to you for the care you have taken of our paper on Dorypterus, and think that the reading an abstract of it was the best thing that could be done under the circumstances – And now we have only to consider how to alter it. – I wish that we could fully adopt your view on the subject, but I cannot completely reconcile to my own mind the characters as I understand them with your

[329 L]

conclusions. –

In the first place the vertebral spines do not seem to be like those of the Pycnodonts though I know them only from figures. In this group they appear to be distinct, but so expansive as to fill up the interspaces – In Dorypterus on the contrary the substance between the so-called spines unites them together, so that when separated the matter is torn. –

Secondly – You draw the sigmoidal plates as overlying the rods – is there any evidence of this fact? – I do not recollect any such appearance.

[329 R]

On the contrary the minor extremity of the sigmoidal plate is attached to the outer end of the rod; and the minor end of the rod is united to the outer extremity of the vertebral spine – are these facts consistent with your views? –

Thirdly – In the shoulders of the fish the vertebral spines, the rods, the sigmoidal plates and the hourglass plates are continuous with each other, - the rods and sigmoidal plates being modified in form though graduated into those of the hinderparts. –

Fourthly – I could find

[330]

no appearance of the bilateral arrangement that must exist if the sigmoidal plates be dermal[?]. –

Fifthly – I think traces of the substance uniting the spines and composing the sigmoidal plates are found on all parts of the body.

I should be glad to have my samples reviewed on these five points, as your view simplifies the matter, and I should like much to be able to adopt it without qualification and so get rid of a vast amount of circumlocution that disfigures the paper – And it would be decidedly better that we should give an opinion than merely discuss the matter pro and con as we have done –

Yours ever truly | Albany Hancock

NEWHM: 2017.H64.38

Thomas Henry Huxley to Albany Hancock, 7 April 1871 HH70

TRANSCRIPTION

Jermyn S

April 7.

1871.

My dear Sir

I am particularly obliged to you for the [?] which have arrived in perfect safety –

I wish I could go to work at them at once

[p2]

but at present I am devoured by public duties of all sorts – and investigating goes to the wall –

I won't stand it much longer. If the Church gets much broader I shall put in for the Deancy of Durham

[p3]

as soon as Lake is made a Bishop – and spend my life in the peaceful organization of your new Science College – afar from all the racket & wear & tear of London

Ever yours very faithfully | T.H. Huxley

P.S. You promised to let

[p4]

me defray any expenses connected with the [?] Pray let me know what they run to

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NEWHM: 2017.H64.39

Thomas Henry Huxley to Albany Hancock, 30 December 1872 HH71

SUMMARY

Here Huxley is acting as a go-between to try to secure some specimens of solitary ascidians (sea squirts) from Hancock for a French biologist, M. Lacaze-Duthiers. Huxley thinks that Hancock may not have responded to the Frenchman due to illness.

TRANSCRIPTION

[No date or address at top; but 30 Dec 1872 at end of letter]

My dear Sir

A short time ago I received a letter from M. Lacaze-Duthiers who mentions having written to you and, as I gather, asked you to supply him with [?] specimens of the species of simple Ascidians you have named. He is going to work at the Ascidians

[p2]

on the coast of France and wants to be able to identify your species – He says that as he has received no answer he fears the letter may have been lost or that you may have thought his request indiscreet and asks me to tell him my views on the subject –

I have heard rumours that you have been very unwell and I know to my

[p3]

cost, what it is to be bothered with letters when in that condition – shall I say as much to Lacaze-Duthiers?

In any case I sincerely hope you are better now & wish best wishes for the new year

Believe me | I am | Yours very truly | T.H. Huxley

4 Marlborough Place | Abbey Road | London NW[?] | Dec 30th 1872

NEWHM: 2017.H64.40

Thomas Henry Huxley to Albany Hancock, 2 July 1873 HH72

TRANSCRIPTION

4, Marlborough Place,

Abbey Rd, N. W. [address is printed]

July 2 1873

My dear Sir

I am quite sorry that I bothered you about Lacaze-Duthiers & his letter – nothing worries me so much as having to write letters when I am ill (I am a bad correspondent at the best of times) and I can fully sympathise

[p2]

with any amount of procrastination in correspondence

I am grieved to hear that you are such a sufferer from dyspepsia. It is another point of sympathy between us as it knocked me up at the beginning of last year & makes my life a burden to me at times – the only comfort is that it does not kill –

This is the fourth or fifth bad

[p3]

attack I have had since I was a boy & after a term of greater or less suffering I always come out on the other side & get hale & hearty again – The only thing is that the process of "coming out" is slower at 47 than at 17 –

Pray remember me very kindly to your brother

&with best wishes | believe me | Yours very faithfully | T.H. Huxley | [To] Albany Hancock Esq

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END OF CORRESPONDENCE (Hancock died 3 months later.)

Genera of molluscs and of other animals that were once considered as molluscs

Acteon (Gastropoda, Heterobranchia, Acteonidae) barrel bubble snails

Alcira (Gastropoda, Caenogastropoda, Buccinoidea) dove snails

Anodonta (Bivalvia, Unionoida, Unionidae) freshwater mussels

Antiopa (Gastropoda, Heterobranchia, Nudibranchia) Now: *Janolus* sea slugs

Aplysia (Gastropoda, Heterobranchia, Aplysiidae) sea hares/slugs (*not* nudibranchs)

Ascidia (Tunicata, Ascidiacea, Ascidiidae) sea squirts

Atlanta (Gastropoda, Littorinimorpha, Atlantidae) marine snails (heteropods)

Bugula (Bryozoa, Cheilostomata, Bugulidae) bryozoans

Buccinum (Gastropoda, Buccinoidea, Buccinidae) whelks

Cardium (Bivalvia, Heterodonta, Cardiidae) cockles

Cleodora (Gastropoda, Heterobranchia, Thecosomata) sea butterflies

Cyclas (Bivalvia, Heterodonta, Sphaeriidae) Now: *Sphaerium* fingernail clams

Doris (Gastropoda, Heterobranchia, Nudibranchia) sea slugs

Eledone (Cephalopoda, Octopodiformes, Octopodida) octopus

Eolis (Gastropoda, Heterobranchia, Nudibranchia) sea slugs Now: *Aeolidia*

Firola (Gastropoda, Littorinimorpha, Pterotrachaeidae) heteropods, sea elephants

Haliotis (Gastropoda, Vetigastropoda, Haliotidae) abalones, ormers

Lingula (Brachiopoda, Lingulata, Lingulidae) lamp shells

Loligo (Cephalopoda, Teuthida, Loliginidae) squid

Mya (Bivalvia, Heterodonta, Myidae) mussels

Nautilus (Cephalopoda, Nautiloidea, Nautilidae) nautilus

Octopus (Cephalopoda, Octopodiformes, Octopodidae) octopus

Ommastrephes (Cephalopoda, Decapodiformes, Ommastrephidae) squid

Patella (Gastropoda, Patellagastropoda, Patellidae) limpets

Pelonaia (Tunicata, Ascidiacea, Styelidae) sea squirts

Phallusia (Tunicata, Ascidiacea, Ascidiidae) sea squirts

Phylliroe (Gastropoda, Heterobranchia, Nudibranchia) sea slugs

Polycera (Gastropoda, Heterobranchia, Nudibranchia) sea slugs

Pyrosoma (Tunicata, Thaliacea, Pyrosomatidae) pyrosomes

Rhynconella (Brachiopoda, Rhynconellata, Rhynconellidae) lamp shells

Salpa (Tunicata, Thaliacea, Salpidae) salps

Sepia (Cephalopoda, Decapodiformes, Sepiidae) cuttlefish

Sepiola (Cephalopoda, Decapodiformes, Sepiolidae) bobtail squid

Terebratula (Brachiopoda, Rhynconellata, Terebratulidae) lamp shells

Tritonia (Gastropoda, Heterobranchia, Nudibranchia) sea slugs

Unio (Bivalvia, Unionida, Unionidae) mussels

Waldheimia (Brachiopoda, Rhynconellata, Terebratellidae) Now: *Magellania*

Genera of fossil vertebrates referred to in the late stages of the correspondence

Dorypterus Extinct genus of ray-finned bony fish (Actinopterygii)

Goniopholis Extinct genus of crocodyliform reptiles (Goniopholididae)

Janassa Extinct genus of cartilaginous fish (Chondricthyes)

Platysomus Extinct genus of ray-finned bony fish (Actinopterygii)

Higher taxa (families up to phyla)

Molluscs et al:

Acephala	Cuvier's old name for the molluscan class Bivalvia
Appendicularia	Another name for Larvacea (class of tunicates)
Argonautidae	Family of argonauts (Cephalopods) with one extant genus (*Argonauta*)
Ascidiidae	Family within class Ascidiacea (paraphyletic) within Tunicata
Brachiopoda	Phylum within Lophotrochozoa (Spiralia) Previously within Mollusca
Bryozoa	Phylum within Lophotrochozoa (Spiralia) Previouly called Polyzoa
Bullidae	Family of sea snails within class Gastropoda (division Heterobranchia)
Cephalous	Cephalous Mollusca: broader than Cephalopoda. Includes also Gastropoda
Decapoda	Now Decapodiformes, within class Cephalopoda Squid and cuttlefish
Gasteroptera	Now family Gasteropteridae, within gastropod superfamily Pilinoidea
Heteropoda	An old name for genus *Atlanta, Firola*, and related genera (heteropods)
Lamellibranchiata	An old name for molluscan class Bivalvia
Nudibranchia	Recognized clade, within division Heterobranchia of class Gastropoda
Pectinobranchiata	Now included in the modern group (sub-class) Caenogastropoda
Polyzoa	An old name for phylum Bryozoa
Pteropoda	Group within Heterobranchia, within Gastropoda Pelagic sea snails/slugs

Vertebrates:

Protorosauria	Extinct order of mostly aquatic reptiles (protosaurs)
Pycnodont	Order of extinct ray-finned bony fish (Actinopterygii, Pycnodontiformes)
Sauria	Large group of diapsid reptiles, including dinosaurs, birds and lepidosaurs
Teleosauridae	Family of extinct crocodyliform reptiles