

THE
Edinburgh
JOURNAL OF SCIENCE,

EXHIBITING

A VIEW OF THE PROGRESS OF DISCOVERY

NATURAL PHILOSOPHY, CHEMISTRY, MINERALOGY, GEOLOGY, BOTANY,
ZOOLOGY, COMPARATIVE ANATOMY, PRACTICAL MECHANICS, GEOGRAPHY,
NAVIGATION, STATISTICS, ANTIQUITIES, AND THE FINE AND USEFUL ARTS.

CONDUCTED BY

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VOL. VII.
APRIL—OCTOBER.

JOHN THOMSON, EDINBURGH:
AND T. CADELL, LONDON.

M.DCCC.XXVII.

agree. But it is obvious enough that his results are not quite accurate. Were we to correct them by substituting the true atomic weight of nickel they would give us,

	Nickel.	Oxygen.
Protoxide composed of -	3.25	+ 1
Peroxide of -	3.25	+ 1.7

numbers approaching pretty nearly to those given by Rothoff.

Upon the whole, I see no reason to doubt that we are in possession of the true atomic weights both of nickel and cobalt.

ART. XXXIV.—*Notice regarding the Ova of the Pontobdella muricata*, Lam. By R. E. GRANT, M. D., F. R. S. Edin., &c. Communicated by the Author.

THE ova of the *Pontobdella muricata* or Skate-leech, (Fig. 6 and 7. Pl. II.) consist of small dark coloured spheres attached by a narrow twisted neck to a spreading membranous base. Each sphere consists of a double capsule containing a thick gelatinous fluid, in the middle of which the young animal lies coiled up generally in one spiral turn. The ova have much the appearance of the seeds of the black pepper, being about two lines in diameter, and having a rough and dull external surface. On the opposite sides of the spheres there are two round prominences, which fall off when the animal is come to maturity, and leave two circular apertures to admit the sea water, or to allow the young *Pontobdella* to escape. The outer capsule, which has a dark greenish brown colour, is thicker and more porous than the inner membrane, which is smooth, thin, and very tough. The stalk which connects the sphere to the flat base is solid, of a black colour, and firm consistence internally, and is strongly marked with longitudinal prominent ridges, which have a twisted and fibrous appearance. The spreading base which adheres to stones, shells, or other hard bodies, consists of the same tough dark-coloured substance as the outer layer of the ovum and the stalk, and is marked with elevated radiating ridges like diverging roots. The ge-

latinous matter within is at first thick and of a milky colour, but becomes more colourless, transparent, and thinner, as the *Pontobdella* approaches maturity, as I have observed in the ova of many molluscous animals. The young animal is visible when only about half a line in length, in the middle of the gelatinous matter, and only one young *Pontobdella* is found in each ovum. The animal is at first quite transparent and of a whitish colour; and when ready to escape, it is nearly an inch in length and has all its external characters distinctly marked. We find these ova generally in groups of thirty or forty adhering to solid bodies in deep water where the *Pontobdella* resides. The merit of having first ascertained them to belong to that animal is due to my zealous young friend Mr Charles Darwin of Shrewsbury, who kindly presented me with specimens of the ova exhibiting the animal in different stages of maturity. They nearly resemble the ova of the *Amphitrite* described and figured by Basterus, (*Op. sub.* Pl. V. Fig. 1. A, B, C, and p. 38.) The ova of the *Pontobdella* have probably escaped notice from the animal generally frequenting the bottom of deep water, where it lives by sucking the blood from the surface of flat fishes; or they may have been mistaken for young marine plants, such as the *Fucus loreus*, from the fibrous appearance and deep-green colour of their outer capsule. The description of the ova of the lower animals forms an interesting, though much neglected part of the history of the species; and an imperfect acquaintance with this part of zoology has sometimes led distinguished naturalists to mistake the ova of marine animals for zoophytes, and zoophytes for the ova of animals.

Plate II. Fig. 6, Entire ovum of the *Pontobdella muricata*, of the natural size, showing the two round lateral prominences, the narrow fibrous stem, and thin spreading base.

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PLATE II.
LERNÆA ELONGATA GR.
twice the nat. size

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Fig. 1.

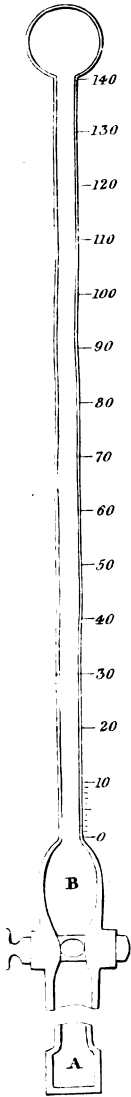


Fig. 3.

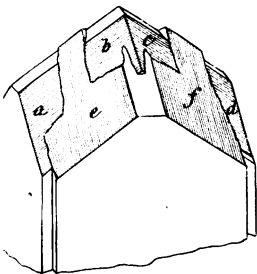


Fig. 2.

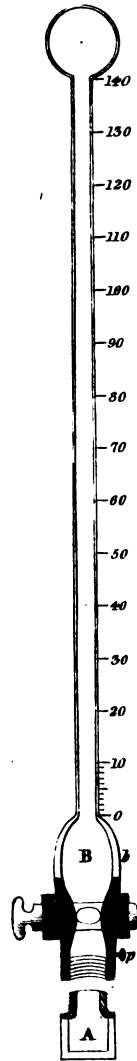


Fig. 4.

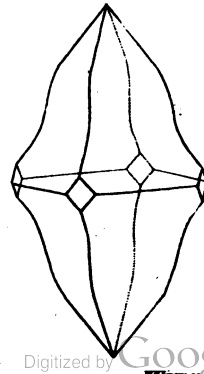


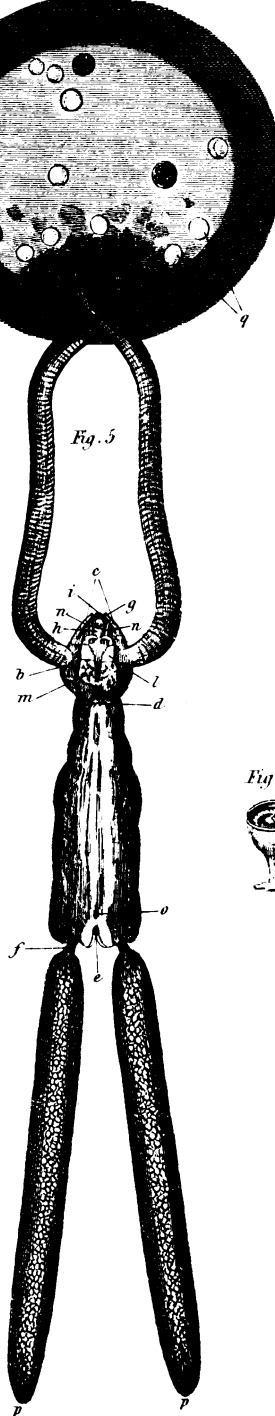
Fig. 6.



Fig. 7.



Fig. 5.



THE
EDINBURGH NEW
PHILOSOPHICAL JOURNAL,

EXHIBITING A VIEW OF THE
PROGRESSIVE DISCOVERIES AND IMPROVEMENTS
IN THE
SCIENCES AND THE ARTS.

CONDUCTED BY

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APRIL...OCTOBER 1827.

TO BE CONTINUED QUARTERLY.

EDINBURGH:

PRINTED FOR ADAM BLACK, NORTH BRIDGE, EDINBURGH;
AND LONGMAN, REES, ORME, BROWN, & GREEN,
LONDON.

1827.



that as a genus, it rests on very insufficient grounds. The tree, however, is evidently related either to *Ficus* or *Brosimum*. The juice contained in the phial sent to Mr Lambert had the appearance of sour cream, and, notwithstanding that it had suffered materially from the long voyage, the taste was by no means unpalatable.

To prevent any misconception of the method taken to increase the female Nutmeg, it may be proper to remark, that, by inarching, he means inarching the branches of the female tree on the young plants produced from seed, by which mode a certain supply of female trees is obtained; whereas from seed, several years must elapse before the trees produce flowers, and then the result must be frequently disappointing; more especially if the disproportion between the number of male and female trees from seed be so great as Mr Lockhart has observed. A very few male trees will be found sufficient for a whole plantation of females. I do not remember of any other instances on record of an absolute change of sex, than the striking ones mentioned above by Mr Lockhart, as occurring in the nutmeg tree. It is a fact well deserving the attention of physiologists. Individual plants, producing at the same time male and female flowers, are of common occurrence.

Observations on the Structure and Nature of Flustræ. By R. E. GRANT, M.D. F.R.S.E. F.L.S. M.W.S. Fellow of the Royal College of Physicians of Edinburgh, Prof. of Zoology in the University of London, &c. (Continued from p. 118.)

IN examining the anatomy of the other species of *Flustræ* above mentioned, more care is required than in the examination of the *F. carbacea*, as the two plains of cells composing the branches of the *F. foliacea* and *F. truncata* require to be carefully separated from each other, and the sessile species, *F. telacea*, *F. dentata*, and *F. pilosa*, require to be removed from the surface of the fuci, or other substances to which they adhere, in order to render them sufficiently transparent to allow their minute structure to be perceived through the reflecting microscope. The *Flustra foliacea*, Lam., like the *F. carbacea*, already described, is an inhabitant of deep water, and is very rarely met with in a fixed situation near the shore, or in places

accessible at ebb tide, though, from the immense quantities of it which I have found drifted alive on our eastern and western coasts, and constantly brought up by the dredges from oyster-beds, it appears to be the most abundant species on the British shores. It generally adheres to shells or stones, on the surface of which it first spreads like a sessile species with a single plain of cells, then rises up in the centre of the expanded base in a branched form, when its branches are always composed of a double plain of cells. It is a very large species, its branches often amounting to many hundreds, and presenting on their two surfaces some hundred square inches of cells. It has a strong and pleasant odour of violets, which it retains for some time after being taken from the sea, and it is probably the species which the inhabitants of Iceland are said to chew as a substitute for tobacco. The branches have a thick, opaque, and coarse appearance, generally a yellowish-grey colour, and a rough surface covered with minute reverted spines; they are variously subdivided, but most frequently present a broad palmate form, terminated by numerous rounded and expanded digitations. The sides of the stems and lower branches do not present the thickened, opaque, and compact margins we find in the *F. truncata* and *F. carbasea*, which are much more delicate species. The tips of the branches are thin, soft, and transparent, as in other branched species, and as in the anterior margin of sessile species, from their containing little calcareous matter, and from the polypi in that situation being young, colourless, and translucent. The boundaries of the cells on the opposite plains do not coincide, nor have they any determinate relation to each other in their position. The broad rounded extremity and the aperture of the cells are always above, the contracted and flat base always below. The cells are arranged on each surface, as in the *F. carbasea*; the opaque sides of the cells form continuous ramified lines from the base to the apex of the branches; and the first cell of a new series in the middle of the branch is always smaller than the cells which surround it, being confined to a small angular space, formed by the bifurcation of the opaque lateral wall of a perfect cell. The tips of the branches are never bounded by a smooth continuous line, as we observe them in the *F. carbasea* and *F. truncata*, but are terminated by the round bulbous ex-

tremities of the last two rows of cells; this remarkable difference is observable by the aid of a common lens.

The cells are shorter and proportionally broader than in the *F. carbacea*, being about the sixth of a line in length, and a little more than half as much in breadth. By tearing the two plains of cells asunder, we render them nearly as transparent as in the *F. carbacea*, and can distinctly perceive the structure of the parts within. The aperture of the cells is formed by a semicircular lid, convex externally and concave internally, which folds down when the polypus is about to advance from the cell. The opening of this lid in the *F. truncata*, where it is very long, appears through the microscope like the opening of a snake's jaws, and the organs by which this motion is effected are not perceptible. The lid of the cells opens and shuts in *flustræ*, without the slightest perceptible synchronous motion of the polypi. We sometimes observe parts, in other calcareous zoophytes, possessing distinct power of motion, though apparently unconnected with the body of the polypi; thus in the *Cellaria avicularia*, Lam. whose polypi have the same structure, and the same connection with the cells as in *flustræ*, I have observed in living specimens a constant motion of flexion and extension in the remarkable testaceous processes shaped like a bird's head, and attached by peduncles to the outside of all the cells. These processes or organs are likewise provided with lateral folds, like the valves of a shell, which have a distinct and regular motion corresponding with the flexion and extension of the entire process. The aperture of each cell of the *F. foliacea*, is defended by four projecting spines, which arise from the calcareous margin of the cell. There are two spines on each side of the aperture, and the upper two are more than twice the length of the lower pair, and slightly curved upwards. When we look transversely on the surface of a branch, the spines appear to be arranged in very regular transverse curved rows, and when we observe the surface longitudinally, they appear to be arranged in very regular longitudinal straight lines. The spines are calcareous, tubular, cylindrical, shut at their extremity, and appear obviously destined to protect the expanded polypi. The two pairs of spines belonging to each cell are placed only on the upper half of the cell, although, from the contiguity of the cells, the lower half of each is likewise defended by the spines of the adjacent cells,

so that they serve also to protract the polypi when in a retracted state. No projecting spines of this kind are found in the *F. carbacea*, and they form the most obvious character of the *F. foliacea*. The bundles of minute spicula pointing horizontally inwards from the margins of the cells in the *F. carbacea* are not present, nor apparently required in this species. By the aid of the microscope, we perceive the same vascular appearance of the thin membranous covering of the cells as in the *F. carbacea*, the same dark round spot in the center of those cells which have lost their polypi, the same imperfectly formed empty cells along the margins of the branches, and similar rudimentary polypi in the last two or three rows of cells at the free extremities of the branches.

The polypi of the *F. foliacea* are about twice as long as the cells, have their body coiled up in a spiral turn, and bifurcated near its lower extremity, and they have the same attachment by bundles of soft loose fibres to the aperture and base of the cells, as in the species already described. They have only fourteen tentacula, sometimes thirteen, which are very long, slender, and ciliated on their two lateral margins. The expanded tentacula form a bell-shaped cavity, into which there is a constant current of water, produced by the incessant rapid vibration of the *ciliæ*, and in the center of this cavity is the circular prominent retractile mouth of the polypus. The tentacula remain in this expanded and regular form, when the polypi are found hanging dead from their cells; and the same is observed in many other zoophytes, which enables us to observe their number and form with more ease through the microscope. The head of the polypus is small, the body comparatively strong, the continuation of the body below the bifurcation very thick, conical, and tapering to its posterior termination, the globular appendix of the body, and its tubular cervix, are smaller than in the *F. carbacea*, and the same opaque matter is found in the cavity of the globular sac. A distinct and constant revolution of particles is seen in the whole of the tube leading from the body of the polypus into the round sac, as if produced by *ciliæ* placed within; there is no pulsation or contraction of the part, nor can we perceive any fluid passing from that cavity into the vessels so extensively ramified on the coats of the cells. A similar continued vibratory motion is seen within the mouth in most polypi, which is

undoubtedly produced by ciliæ in that situation ; these minute processes appear to be the only active organs in the circulation of the fluids in zoophytes. The body of the polypus has the usual red colour, while the head and arms are nearly colourless. The long cylindrical and curved body of the polypus is tubular to its posterior termination, which is shut ; and we can sometimes perceive a small bolus of food moving to and fro in the conical part of the body below the bifurcation. The globular sac in this species does not appear to be connected with the formation of the ovum, nor with the regeneration of new polypi in the old cells.

The ova of this species of *flustra* begin to appear early in autumn, and continue to be generated in the cells during the whole winter ; those of the *F. carbacea* make their appearance later in the season ; and I have elsewhere shewn, that, in other zoophytes, different species of the same genus vary much in their season of generation, though residing together on the same rock. The ova first make their appearance at the narrow base of the cells as very small, pale-red, gelatinous spheres, and the polypi of such cells are generally removed, and only a small round dark brown spot is seen in their stead, in the center of the cells. There is but one ovum in each cell, as in other *flustræ* and calcareous *cellariæ* ; and, as it enlarges in size, it advances higher in the cell, till, in its mature state, it occupies the broad upper part of the cell. When the mature ovum is found at the summit of the cell, we observe a distinct wide helmet-shaped capsule surrounding it, and separating it from the cavity of the cell. By examining the ovum within this capsule, with the microscope, we perceive its ciliæ in rapid motion ; and I have frequently observed the ovum, in this situation, contract itself in different directions, shrink back in its capsule, and exhibit other signs of irritability before its final escape. The helmet-shaped capsule of the ovum is open at the top, and connected with the aperture of the cell, so that the ovum readily escapes, by contracting its body and moving its ciliæ. On escaping from the cell, the ovum glides to and fro by the action of its ciliæ, and, after fixing, it is converted into a single complete cell, from which new cells shoot forward. Polypi make their appearance in shut sacs, at the bottom of the new cells, when they are sufficiently formed to protect them. When the ovum has escaped from the cell, the dark round spot in the center of the cell enlarges, and a new po-

lypus shoots out from that point, so that, at this season, we observe young polypi, in every situation, on the branches, the whole of the old cells are thus never found entirely deserted, the same cells may repeatedly produce ova and polypi, and the whole zoophyte retain its energy for several seasons.

Account of an Aurora Borealis, observed at Edinburgh 16th January 1827; with some particulars of another, of a preceding year. With a Plate. By D. BLACKADER, Esq. Communicated by the Author.

ABOUT 9 o'clock, P. M., evening fine, brilliant moonshine, a beautiful white, opaque, drapery of cloud, extending from the zenith to within about 15° of the NW. horizon. The wind had for some days been boisterous and variable, and had veered, in the morning, from NW. to NE.; but the air was now calm and serene. In the course of a few minutes the cloudy tissue had entirely disappeared, and a brilliant aurora was exhibited, in rapid change of feature, and distinguished by unusual proximity. Horizontal cloudy vapours, of great tenuity, repeatedly accompanied its more brilliant evolutions, seeming to support its columns; appearing and vanishing with the more vivid coruscations. Thereafter, the aurora became extended, to right and left, forming the segment of a large circle, although not exceeding in altitude more than 15° , and, at either extremity, vanishing, like the higher strata of clouds, in the blue expanse. This arch may be conceived of by means of the sketch, Plate IV. No. 1.; whereof the landscape includes an angle of about 90° , having its centre in the magnetic meridian; near to which a principal star is seen, at that hour. The lower edge of this arch was always above that star. Subsequently, a second arch was formed in front thereof.

On the right extremity, the arch always presented a broken or interrupted line, with recurrence of separate masses of luminous spears, of a brilliant bluish-white lustre; a golden tint, and burnished lustre, distinguished the continuous arch of the central portion, which, towards the left, became coppery. The second, or front line, was uncommonly distinct, and much nearer than the one first formed. Other figures, afterwards

Darwin's Notes on Flustra

From: Barrett, P. H. ed. 1977. "On the Ova of Flustra, or, Early Notebook, Containing Observations Made by C.D. When He Was at Edinburgh, March 1827." In Barrett, P. ed., *The collected papers of Charles Darwin*. 2 vols. Chicago: University Press, 2: 285-91.

<http://darwin-online.org.uk/content/frameset?itemID=F1583a&viewtype=text&pageseq=1>

On the Ova of Flustra, or, Early Notebook, Containing Observations Made by Charles Darwin When He Was at Edinburgh, March 1827

March 16th 1827

(1) Procured from the black rocks at Leith a large Cyclopterus Lumpus (common lump fish). Length from snout to tail 23 1/2 inches, girth 19 1/2. It had evidently come to the rocks to spawn & was there left stranded by the tide; its ovaria contained a great mass of spawn of a rose colour. Dissected it with Dr. Grant. It appeared very free from disease & had no intestinal worms; its back however was covered with small crustaceous animals.—Eyes small. Hence probably does not inhabit deep seas? Stomach large. Liver without gall-bladder. Kidneys situated some way from the Vertebrae: an unusual fact in cartilaginous Fishes. Air bladder was not seen. Brain very small; the optic nerves being nearly as large as the spinal cord, neither the brain or spinal matter nearly filling its cavity. The valves in the heart were very distinct; the peduncle strong. The body was not covered with <skin> [?]² scales, but slimy & remarkably thick. The sucker on its breast was of a white colour. I believe it is generally a reddish yellow? The plebs differ whether it is edible.

(2) Procured a small green Aeolis³ & a Tritonia.⁴

(3) Examined the ova of the Purpura Lapillus⁵ & found them out of their capsules & of this shape.

March 18th

(4) Found these growing out of an Alcyonium.⁶—?

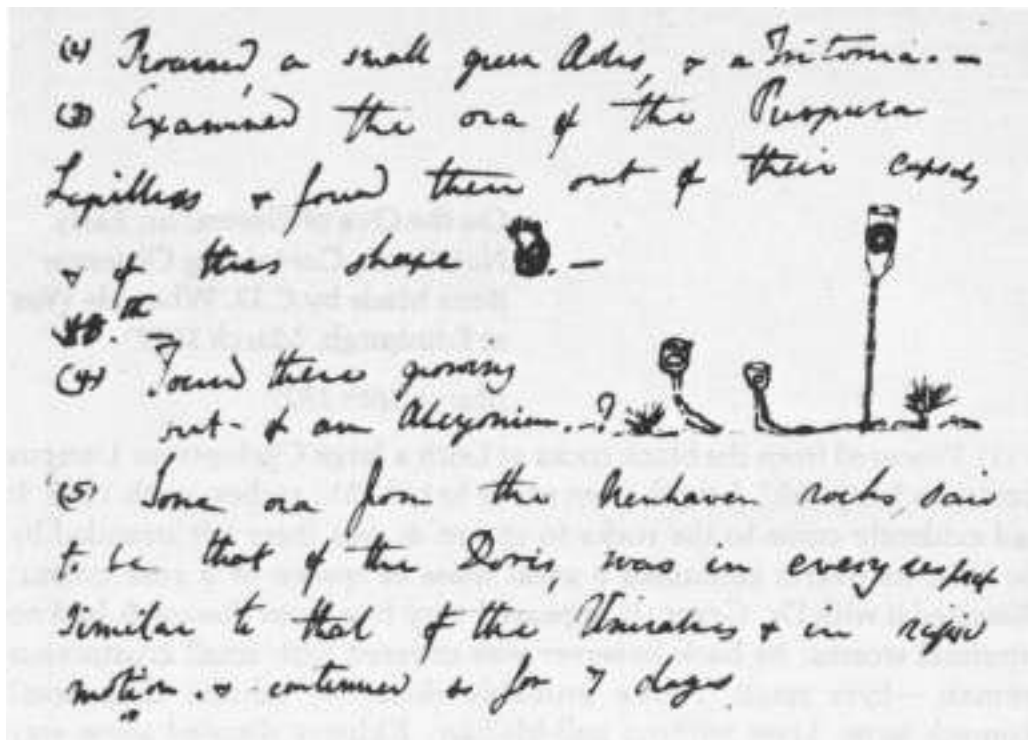
(5) Some ova from the Newhaven rocks said to be that of the Doris,⁷ was in every respect similar to that of the Univalves & in rapid motion, & continued so for 7 days.

March 19th

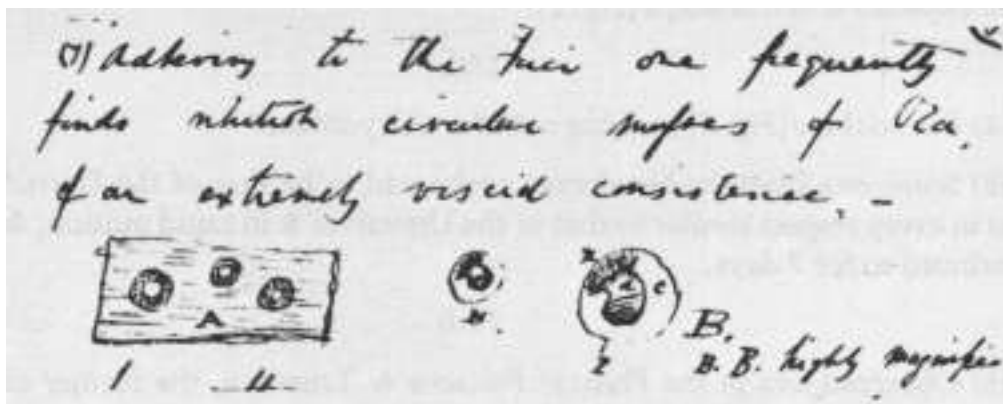
(6) Observed ova in the Flustra⁸ Foliacea & Truncata, the former of which were in motion.

March 28th

(7) Adhering to the Fuci⁹ one frequently finds whitish circular masses of Ova, of an extremely viscid consistence,—& have the appearance represented at A, when magnified however, it appears to be a mass [of] capsules P¹⁰ containing animals d united together by a transparent gelatinous matter. In this species I believe I was the first to observe both the animal d, & its ciliae, x, in most rapid movement. By the aid of these ciliae it could revolve in its capsule & when freed from it moved so quickly, as to be discernible to the naked eye at some distance. To what animal these ova belong. I am ignorant?

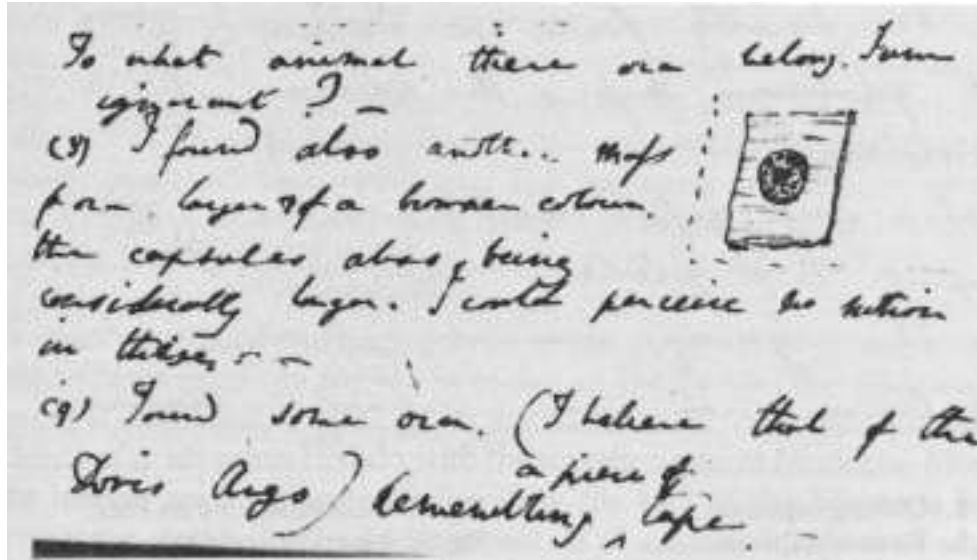


Ova of *Purpura lapillus* and Growth of *Alcyonium*.



Ova adhering to fuci.

(8) I found also another mass of ova, larger & of a browner colour, the capsules also being considerably larger. I could perceive no motion in these.

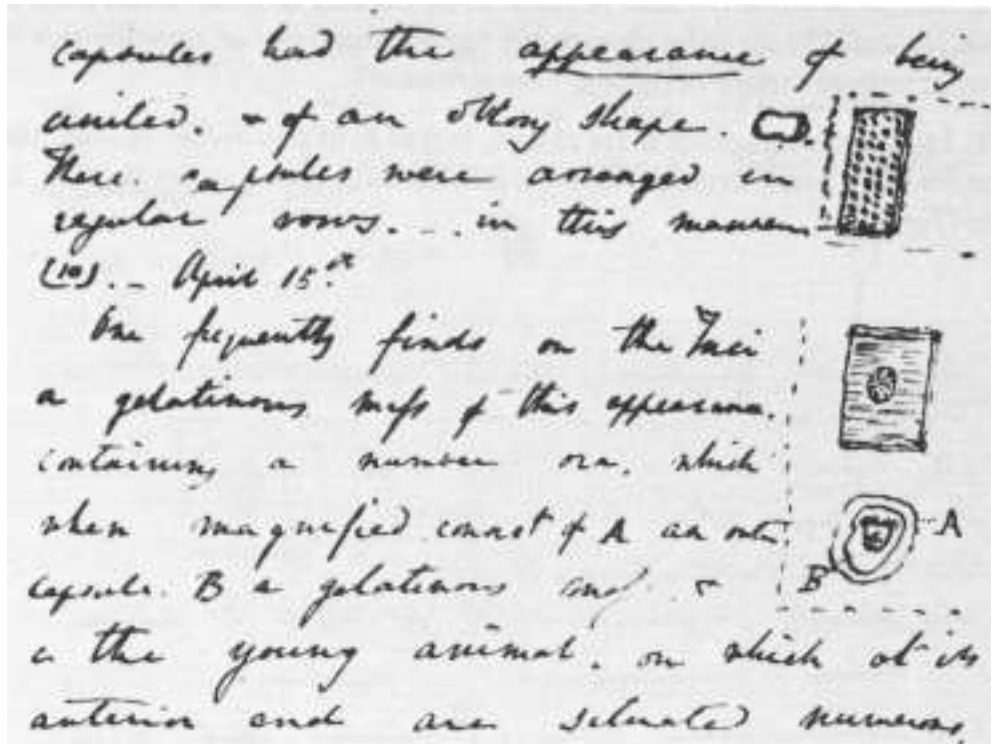


Mass of brown ova.

(9) Found some ova (I believe that of the Doris Argo) resembling a piece of tape.—the capsules were rather irregular, containing from 1 to 3 angular shaped bodies.—in which I could perceive no motion.—the capsules had the appearance of being united, & of an oblong shape. These capsules were arranged in regular rows—in this manner.

April 15th

(10) One frequently finds on the Fuci a gelatinous mass of this appearance containing a number [of] ova, which when magnified consist of A, an outer capsule B a gelatinous mass, &c the young animal on which at its anterior end are situated numerous ciliae. These by their constant motion cause the young animal to turn rapidly round within the capsule,—& when freed from its capsule to move to & fro in the water with the greatest ease. I kept some of these ova in a bottle of the same water & at the end of 30 days were yet in motion.—



Oblong capsules. Gelatinous ova on Fuci.
 Rows of capsules. Magnified ova.

April 20th

(11) Having procured some specimens of the *Flustra Carbocea* (Lam.) from the dredge boats at Newhaven, I soon perceived without the aid of a microscope small yellow bodies studded in different directions on it. They were of an oval shape & of the colour of the yolk of an egg, each occupying one cell. Whilst in their cells I could perceive no motion: but when left at rest in a watch glass, or shaken they glided to & fro with so rapid a motion, as at some distance to be distinctly visible to the naked eye. When highly magnified, the ciliae, which were chiefly distributed on the broader end, were seen in rapid motion; the central ones being the longest. I may mention that I have also observed ova of the *Flustra Foliacea* & *Truncata* in motion. That such ova had organs of motion does not appear to have been hitherto observed either by Lamarck Cuvier Lamouroux or any other author. This fact although at first it may appear of little importance, yet by adducing one more to the already numerous examples will tend to generalise the law that the ova of all Zoophytes enjoy spontaneous motion.

This & the following communication was read both before the Wernerian & Plinian Societies.

(12) One frequently finds sticking to oyster & other old shells small black globular bodies, which the fishermen call great Pepper-corns. These have hitherto been always mistaken for the young *Fucus Lorius* to which it bears a great resemblance. Having opened some of these they at first appeared only to contain an extremely viscid fluid without any traces [of] organisation; but on examining some others I found that this fluid by degrees acquiring a vermicular shape, when matured was the young *Pontobdella*¹¹ *Muricata* (Lam.) which were in every respect perfect & in motion. Each ovum consisted of two parts, the outer capsule being cori[a]ceous & of considerable thickness, whilst the inner consisted merely of a thin black membrane. This bag never contained more than one animal, in which it differs remarkably from that of other Molluscos animals such as the *Doris Buccinum Purpura* &c. &c., for in these one capsule generally contains numerous ova. At each end there is a prominent orifice, which appears to be the outlet

of the young animal, but hitherto mistaken for the branches of the Fucus. The adult animal bears a considerable analogy to the Leeches & was even placed by Linnaeus in his genus *Hirudo* with the specific name of *Muricata*. Most of the leeches are viviparous & therefore the fact of the *Muricata* being oviparous, besides on its own account, is of value as it shows to what a great extent the mode of generation differs in the lower animals.

(13) Procured on 15th of April from deep water in Frith of Forth a good many specimens of the *Pennatula* *Mirabilis*. The Polype were situated on one side of the bony axis in alternate lunate fillets in number from 70-80. Each fillet consisted of about 12 polype. Towards one end of many of the longest specimens a yellowish appearance, which upon examination turned out to be numerous ova. They were situated between the fillets towards the bare side of the stem. They were easily separated in great number from the gelatinous axis upon its being torn. But I could perceive no motion.

April 23rd

(14) Procured from the Frith of Forth numerous specimens of the *Pennatula Phosphorea*¹² differs from the *Mirabilis* in there being only 20 rows or Fillets of polype, & in these rows about 12 Polype. These fillets are opposite & decrease in size towards both end of the axis. The bony axis does not appear at either end of the Zoophite as it does in the *Mirabilis*, but gradually tapers into two filiform soft & flexible points embedded in the fleshy matter. Inclosed in & at the base of the fillets were several ova of a large size & of a yellow colour could perceive no motion. I may remark that each fillet is broadest in the middle & tapers toward both ends. The whole Zoophite has a soft <glu> slimy feel, & of a red colour. The long axis in both of the above-mentioned species effervesced rapidly with nitric acid.

(15) Observed, with Mr. Coldstream at the black rocks at Leith, an *Asterias*¹³ *rubens* doubled up as it were, so that the disk part formed pouch, in which were numerous loose ova, which the animal was in act of discharging from its mouth. The double Ovaria in each of the animals limbs contained a mass of ova of a small size & of an orange colour.

(16) Having taken a grain of pollen out of the Anther in an unopened *Geranium* flower: I placed it in spirits of wine: it was of a spherical shape & of a yellow colour: after remaining a minute in the Spirits three transparent cones were protruded from its side: these in the course of a few minutes burst, & sent, with great violence, from one of the cones numberless granules: By the next morning (the *Geranium* being kept in water) the Anthers had deshisced & the pollen was scattered about. A grain now being placed in <water> Spirits, emitted its contents with such force that the grain itself moved very rapidly in the liquid so rapidly indeed, that I could not follow with the microscope: When placed in water it exploded almost instantly but not with quite such force.

The Epidermis of the Petals in the *Geranium* is very curious; it consists of 6 (or occasionally 7) sided cells) on the sides of these cells; these [had] 12 small projections which alternate with those of the neighbouring cells: it has the same appearance, both on upper & under side: no stomata: In the Stamina, the cuticle [cells] of the Filament were Rhomboidal: in the covering of the Antherii the cells had knobbed sides: The pistil full of Tracheae. Cuticle with Rhomboidal cells. Sepals full of Tracheae. Cuticle with oblong cells. The cells in the cuticle of the Bracteae very irregular oblong: in the Pedicel rather more regular.—A Transverse section of this latter part gives a star-like appearance, this is owing to about 10 groups of ducts set within a ring of them: by dissecting a portion of the pedicel vertically these ducts were very easily seen: without this darkish ring came a circle of rather irregularly celled parenchymatous matter: then ring of green matter: then cuticle.—Examined the grain of pollen in *Orchis morio*. they are of a green colour & of a wedge shape with the sharp end truncated. They are fastened at their narrow ends one to the other by a highly elastic thread.—

Footnotes

1. Cambridge University Library Handlist (1960) no. 118. Acknowledgment is due the Cambridge University Library for microfilm copies and for permission to publish this transcription. Parts of this paper were transcribed and published by J. H. Ashworth in "Charles Darwin as a Student in Edinburgh, 1825-1827," *Proceedings of the Royal Society of Edinburgh*, 55 (1934-35): 97-113.

Accounts differ on the exact time, place, and subject of the paper's presentation. In the paper Darwin says (page 289), "This & the following communication was read both before the Wernerian & Plinian Societies." In his autobiography (written in his sixty-seventh year) he says, "I made one interesting little discovery, and read, about the beginning of the year 1826, a short paper on the subject before the Plinian Society. This was that the so-called ova of *Flustra* had the power of independent movement by means of cilia, and were in fact larvae. In another short paper I showed that the little globular bodies which had been supposed to be the young state of *Fucus loreus* were the egg-cases of the wormlike *Pontobdella muricata*." The "minute-book" records of the Plinian Natural History Society (now in the Edinburgh University Library) show that on 27 March 1827 "Mr. Darwin communicated to the Society two discoveries which he had made:

1. That the ova of the *Flustra* possess organs of motion.

2. That the small black globular body hitherto mistaken for the young *Fucus lori* is in reality the ovum of the *Pontobdella muricata*." (Ashworth, *ibid.*, p. 103).

Some of the notes in the paper are dated 15 April or later, suggesting this manuscript was not the copy used by Darwin for his presentation. Possibly it was used at a later meeting not recorded in the "minute-book." Ashworth provides a more complete discussion of historical circumstances surrounding this paper.†

2. The word *skin* seems to have been written in, then lightly crossed through. Note: angular brackets enclose words crossed through in the original manuscript.†

3. *Aeolis*: anudibranchiate mollusk.†

4. *Tritonia*: Gastropoda.†

5. *Purpura lapillus*: Grostropoda.†

6. *Alcyonium*: an Actinozoa of the Coelenterata.†

7. *Doris*: an udibranchiate mollusk.†

8. *Flustra*: a Bryozoan.†

9. *Fucus*: brown algae; Fucaceae.†

10. Probably should be "B." Darwin in haste perhaps added "P" to the drawing, after inadvertently saying "P" in the text.†

11. *Pontobdella*: Hirudinea.†

12. *Pennatula*: sea pen; Pennatulidae of the Actinozoa.†

13. Asterias: a starfish.†

Letter 16 Darwin to R. W. Darwin

[23 Oct 1825]

[Edinburgh]
Sunday morning.

My dear Father

As I suppose Erasmus has given all the particulars of the journey I will say no more about it, except that altogether it has cost me 7 pounds— We got into our lodgings yesterday evening, which are very comfortable & near the College— Our Landlady, by name Mrs. Mackay, is a nice clean old body, and exceedingly civil & attentive— She lives in “11 Lothian Street Edinburg”^{f2} & only four flights of steps from the ground floor which is very moderate to some other lodgings that we were nearly taking— The terms are 1£—6s . for two very nice & *light* bedrooms & a nice sitting room; by the way, light bedrooms are very scarce articles in Edinburg, since most of them are little holes in which there is neither air or light. We called on Dr. Hawley^{f3} the first morning, whom I think we never should have found had it not been a good natured Dr. of Divinity who took us into his Library & showed us a map, & gave us how find him: Indeed all the Scotchmen are so civil and attentive, that it is enough to make an Englishman ashamed of himself—

I should think Dr. Butler or any other fat English divine would take two utter strangers into his library and show them the way! When at last we found the Doctor & having made all the proper speeches on both sides we all three set out and walked all about the town; which we admire excessively; indeed Bridge Street is the most extraordinary thing I ever saw, and when we first looked over the sides we could hardly believe our eyes, when, instead of a fine river we saw a stream of people—

We spend all our mornings in promenading about the town, which we know pretty well, and in the Evenings we go to the play to hear Miss Stephens,^{f4} which is quite delightful. She is very popular here, being encored to such a degree that she can hardly get on with the play— On Monday we are going to Der Fr.^{f5} (I do not know how to spell the rest of the word)— Before we got into our lodgings we were staying at the Star Hotel in Princes St. where to my surprise I met with an old school fellow whom I like very much; he is just come back from a walking tour in Switzerland, and is now going to study for [his degree?].

The introductory lectures begin next Wednesday, and we were matriculated for them on Saturday: we pay 10s. & write our names in a book, & the ceremony is finished; but the Library is not free to us till we get a ticket from a Professor—^{f6}

We have just been to church and heard a sermon of only 20 minutes. I expected from Sir Walter Scott’s account, a soul-cutting discourse of 2 hours & a half—

I remain Yr. affectionate son | C. Darwin.

Footnotes

^{f1} Dated from the reference to lectures beginning ‘next Wednesday’. Lectures for the 1825–6 session at the University began on Wednesday, 26 October (Ashworth 1935, p. 97).

f2 The site is now occupied by the Lecture Theatre of the Royal Scottish Museum (information supplied by Mr Antony P. Shearman, City Librarian of Edinburgh).

f3 Probably Richard Maddock Hawley. The copy and Francis Darwin's version both read 'Hanley', but no doctor by that name has been located. In her letter of [26 October 1825], Catherine Darwin clearly wrote 'Hawley'.

f4 Catherine Stephens, a leading soprano of the time. During October 1825 she appeared at the Theatre-Royal, Edinburgh.

f5 *Der Freischütz* by Carl Maria Friedrich Ernst von Weber was first performed at the Theatre-Royal, Edinburgh on 29 December 1824 (Harvard College Library Theatre Collection).

f6 The anonymous author of two articles in the *St. James's Gazette*, 'Darwin in Edinburgh.-I.', 16 February 1888, and 'Darwin in Edinburgh.-II.', 17 February 1888, states that the University Library record books for 1825-6 (since lost) showed that CD and Erasmus borrowed more books than other students. The *St. James's Gazette* passage on CD's borrowing reads: 'They included Good's "Study" [Good 1822] (with which his list opened), Pemberton on Viscera [Pemberton 1806] (which Erasmus also took out), Young's Philosophy [Young 1807], Fleming's Zoology [Fleming 1822], Kerr [?Kerr 1792] and Foster [not identified], two volumes on entomology, Wood on Insects [Wood 1821], Brook's Conchology [Brookes 1815], and Newton's Optics [Newton 1704]... What may be called the only lay work he took out was Boswell's Johnson [Boswell 1791], which he seems to have read all through, carrying off a volume at a time.' (16 February 1888, p. 5). In the following session (1826-7), however, CD did not pay the library deposit and borrowed no books at all (17 February 1888, p. 7) He paid his fees for two classes 'Practice of Physic' and 'Midwifery' and attended Robert Jameson's lectures in Geology and Zoology, which he remembered as having been 'incredibly dull' (*Autobiography*, p. 52).

f7 The original of the letter has not been found. A copy made for Francis Darwin (by CD's sister, Caroline) has been compared with the text published in *ML* 1: 5-7. The copy has been followed rather than the printed text wherever Francis diverged from it to conform to the editorial style of *ML*. Where he differs from the copyist's transcription of words, his version has been adopted as more probable, unless clear evidence for an alternative rendering exists, as in the case of 'Edinburg' and 'altogether' (see letter from Catherine Darwin, [26 October 1825]). In *ML* 1: 7 'his [degree?]' was supplied in a space left blank in the copy. See also the Manuscript alterations and comments for this letter.

Letter 20 Darwin to C. S. Darwin

6 Jan 1826

Edinburgh.
Jan. 6th. | 1826—

My dear Caroline,

Many thanks for your very entertaining letter, which was a great relief after hearing a long stupid lecture from Duncan on Materia Medica— But as you know nothing either of the Lecture or Lecturers, I will give you a short account of them.— Dr. Duncan is so very learned that his wisdom has left no room for his sense, & he lectures, as I have already said, on the Materia Medica, which cannot be translated into any word expressive enough of its stupidity. These few last mornings, however, he has shown signs of improvement & I hope he will “go on as well as can be expected.”^{f1} His lectures begin at eight in the morning.— Dr. Hope^{f2} begins at ten o’clock, & I like both him & his lectures *very* much. (After which Erasmus goes to Mr. Lizars^{f3} on Anatomy”, who is a charming Lecturer) At 12, the Hospital, after which I attend Munro on Anatomy— I dislike him & his Lectures so much that I cannot speak with decency about them.^{f4} He is so dirty in person & actions.— Thrice a week we have what is called Clinical Lectures, which means lectures on the sick people in the Hospitals—these I like *very* much.—^{f5} I said this account should be short, but I am afraid it has been too long like the Lectures themselves.—

I will be a good *boy*, and tell something about Johnson again (not but what I am very much surprised that Papa should so forget himself as to call me, a Collegian in the University of Edinburgh, a boy.) he has changed his lodgings for the third time, he has got very cheap ones, but I am afraid it will not answer, for they must make up by cheating.— I hope you like Erasmus’ official news, he means to begin every letter so.—You mentioned in your letter that Emma was staying with you, if she is not gone ask her to tell Jos.^{f6} that I have not succeeded in getting any [titanium],^{f7} but that I will try again. Tell Katty and Susan I shall be very grateful if they will write to me, it is so pleasant receiving letters; and I hope, although our correspondence has begun late, you will send me many more nice affecting letters about dear little black nose. Erasmus thinks I shall have more pleasure in seeing it than all the rest of the families put together. You seem to hold the same opinion with regard to my dear little nephew.— I want to know how old I shall be next Birthday. I believe 17, & if so I shall be forced to go abroad for one year since it is necessary that I shall have completed my 21st. year before I take my degree. Now you have no business to be frowning & puzzling over this letter for I did not promise to write a good hand to you.

I remain your af— dear Caroline, | C. Darwin.

Love to Papa & tell him I am going to write to him in a few days—

Footnotes

^{f1} CD refers to Andrew Duncan, the younger. A more favourable estimate of him is cited in Ashworth 1935. For a summary of the sources and background of all that is known of CD’s student days at Edinburgh, see Shepperson 1961.

^{f2} Thomas Charles Hope.

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f3 The copy reads 'Lezars', which Francis Darwin changed to 'Sizars' (*ML* 1: 7). However, CD almost certainly referred to the surgeon John Lizars, later Professor of Surgery at the Royal College of Surgeons, Edinburgh, author of *Lizars* 1822.

f4 In the *Autobiography*, p. 47, CD says of Alexander Monro, the third: '[He] made his lectures on human anatomy as dull, as he was himself, and the subject disgusted me. It has proved one of the greatest evils in my life that I was not urged to practise dissection, for I should soon have got over my disgust; and the practice would have been invaluable for all my future work. This has been an irremediable evil, as well as my incapacity to draw.'

f5 Little manuscript material survives from CD's student days at Edinburgh. Some of his lecture notes of 1825–6, on medicine and chemistry, are preserved in DAR 5, which also contains an account of a zoological walk to Portobello. DAR 129 contains a diary of zoological and botanical observations made in 1826. A notebook in DAR 118 of zoological observations made in March 1827 records his observations on *Flustra* and *Pontobdella muricata* which he reported to the Plinian Natural History Society of the University of Edinburgh on 27 March 1827 (not 1826, as CD states in the *Autobiography*, p. 50). See *Collected papers* 2: 285–91 for a complete transcription by P. H. Barrett of the notebook, and Ashworth 1935, pp. 102–5, for an account of the Plinian Society meetings and CD's membership, drawn from the minutebooks of the Society.

f6 Josiah Wedgwood III.

f7 A blank space was left in the copy after the word 'any'; 'titanium' was inserted by Francis Darwin.

Letter 68 Darwin to W. D. Fox

[15 July 1829]

[Shrewsbury]
Wednesday

My dear Fox

Many thanks for your letter, it was very good of you to write so soon, the reason of my writing now is not to fulfill my promise of a long letter, for that is, I am afraid impossible, but to tell you, that, yours & Pulleins birds skins are in my room. Mr. Aiken seemed to be rather troubled with the size of the Boxes, for indeed they quite filled his little room, so I believe he has one box, & I have two, (in one of which is the ring-Owzel), but I am sorry to say the Key is locked up in one of my drawers. But if you were to write to Impey, he could send the boxes (first getting them broken open & packed up by Mr Brett) to Osmaston—I am very sorry I have given so much trouble. But I did not think it fair to leave such Leviathan-like boxes in Mr. Aikens house.— I am also sorry to hear that some of your insects got loose. I thought I had packed them pretty tight:—

It is terrible news to me to hear that you have been idle in the good cause, but I hope soon that your zeal will be renewed. You will see my name in Stephens' last number.^{fl} I am glad of it if it is merely to spite Mr. Jenyns.— I shall like very much looking over all your insects again, & I think I shall be able to name a great number of the *genus* Colymbetes: I have a great number of insects at Cambridge for you, & you shall have the duplicates of every thing I take this summer. whenever I take any thing good, you may rely upon it, that you always are uppermost in my mind: I shall not soon forget my first entomological walks with you, & poor little Way: I cannot help often wishing to hear something about him.—I have some thoughts of going for a week into Wales again this summer: would it be impossible for you to come here & then go on with me. We should do wonders amongst the Carabi.— I told Polo to collect, but I am afraid he will never do much more as an Entomologist he is grown far too idle. You had better try your hand at him, for I despair.— You shall receive before very long, the two Martens, and my Dundiver.—

Recollect what the sum of money is that I am indebted to you, as I do not keep account, but you pretend to do, so put it to the proof, and do not forget.—

I am going to Maer next week in order to Entomolog & shall stay there a week: for the rest of this summer I intend to lead a perfectly idle & wandering life, always taking care to have as little of home & as much of Woodhouse as possible. You see I am much in the same state that you are, with this difference you make good resolutions & never keep them. I never make them, so cannot keep them: It is all very well writing in this manner, but I must read for my little Go. Graham smiled & bowed so very civilly, when he told me that he was one of the six appointed to make the examination stricter, & that they were determined they would make it a very different thing from any previous examination that from all this, I am sure, it will be the very devil to pay amongst all idle men & Entomologists. Erasmus we expect home in a few weeks time; he intends passing next winter in Paris:—

Be sure you order the 2 lists of insects, published by Stephens, one printed on both sides, & the other, only on one. You will find them very useful in many points of view.

Dear old Fox, yours | C. Darwin

Postmark: Postmark: Shrewsbury JY 16 1829

Footnotes

^{f1}It is not clear to which number of Stephens 1827–46 CD refers. The 1 June 1829 number on *Haustellata*, vol. 2, has an entry (p. 200) ‘*Graphiphora plecta*“Cambridge”.— C. Darwin, Esq.’ The number dated 15 June 1829 of *Mandibulata*, vol. 2, Appendix (p. 194) lists 13 species of beetles reported by CD. The report of the moth, if it appeared early in June, would be the first time CD’s name appeared in print, but in the *Autobiography*, p. 63, where he writes of his delight at first seeing the magic words, “captured by C. Darwin, Esq.”, his memory is of beetle collecting. Unfortunately the ‘magic words’ do not help in making a clear decision about the date or the publication; they do not occur in either list, nor have they been found elsewhere in *Illustrations of British entomology*. A total of 35 species of insects, 34 of them beetles, are listed as taken by CD. (See also Freeman 1977, pp. 19–20.)

Letter 78 Darwin to W. D. Fox

[25 Mar 1830]

[Cambridge]

Thursday

My dear Fox

I am through my little Go,!!!^{f1} I am too much exalted to humble myself by apologizing for not having written before.— But, I assure you before I went in & when my nerves were in a shattered & weak condition, your injured person often rose before my eyes & taunted me with my idleness. But I am through through through. I could write the whole sheet full, with this delightful word.— I went in yesterday, & have just heard the joyful news.— I shall not know for a week, which class I am in.— The whole examination is carried on in a different system. It has one grand advantage, being over in one day. They are rather strict; & ask a wonderful number of questions:

And now I want to know something about your plans: *of course* you intend coming up here: what fun we will have together, what beetles we will catch, it will do my heart good to go once more together to some of our old haunts: I have two very promising pupils in Entomology, & we will make regular campaigns into the Fens; Heaven protect the beetles & Mr Jenyns, for we wont leave him a pair in the whole country. My new cabinet is come down & a gay little affair it is.—

And now for the time, I think I shall go for a few days to Town, to hear an Opera & see Mr. Hope; not to mention my brother also whom I should have no objection to see.— If I go pretty soon, you can come afterwards but if you will settle your plans definitely, I will arrange mine. So send me a letter by return of post:— And I charge you let it be favourable, that is to say come directly.—

Holden has been ordained, & drove the Coach out on the Monday, I do not think he is looking very well.— Chapman wants you & myself to pay him a visit, when you come up, & begs to be remembered to you. You must excuse this short letter, as I have no end more to send off by this days post.—

I long to see you again, & till then | My dear good old Fox | I am yours most sincerely

| C. Darwin

Postmark: Postmark: Cambridge MA 25 1830

Footnotes

^{f1} The results were published in two lists: those who passed with credit, and those to whom the Examiners had *only not refused* their certification of approval. CD's name appeared in the first list (Cambridge University Archives Pass Lists, Previous Examinations 1824–83, Exam. L. 9).

Letter 98 Darwin to C. S. Darwin

[28 Apr 1831]

[Cambridge]
Thursday

My Dear Caroline,

I want to hear some Shropshire politics, & I write in the hopes of having an answer.— I will give you a short hand account of myself since I left Shrewsbury.— I spent a very pleasant week in London, but found it as I always do, very fatiguing (I expect Erasmus did also for we lived together). Through Tom's^{f2} assistance I got a ticket for the Antient music which was most admirable; but what I liked most in all London is the Zoolog: Gardens: on a hot day when the beasts look happy and the people gay it is most delightful.— Cambridge, I find, is one of the few places, where if you anticipate a great deal of pleasure you do not find yourself disappointed: every day in the Term that passes I feel a loss; and the days go so quietly that I never do half what I intend to in the morning.— I am very busy and work all morning till Henslow's lecture: in the evenings I generally go out somewhere, and occasionally dinner parties, where goodeating and good-talking make a most harmonious whole (I hope you are disgusted, I will excuse anybody till they have been to a Cam: dinner, & if they are there, and if they cry out "what a disgusting thing a good dinner is" I must give them up.) The Election here is a great bore, as Henslow is Lord Palmerston's right-hand man,^{f3} and he has no time for walks.— All the while I am writing now my head is running about the Tropics: in the morning I go and gaze at Palm trees in the hot-house and come home and read Humboldt: my enthusiasm is so great that I cannot hardly sit still on my chair. Henslow & other Dons give us great credit for our plan: Henslow promises to cram me in geology.— I never will be easy till I see the peak of Teneriffe and the great Dragon tree; sandy, dazzling, plains, and gloomy silent forest are alternately uppermost in my mind.— I am working regularly at Spanish; Erasmus advised me decidedly to give up Italian. I have written myself into a Tropical glow.

goodbye | C Darwin

tell me Gossip write soon

I took my Degree the other day:^{f4} it cost me £15: there is waste of money. Love to all you do not hear from me often, so you must excuse my being as Egotistical as Hope.— I begin to think Natural Hist: makes people Egotistical.

Footnotes

^{f1} The copyist noted 'Postmark Cambridge April 28th (?)'. The query apparently indicates that the year was illegible.

^{f2} Thomas Josiah Wedgwood.

^{f3} John Stevens Henslow, originally a Tory, followed Lord Palmerston when he changed parties in 1828. In the elections of 1831 Palmerston lost his seat as M.P. for Cambridge University because of his support of Parliamentary reform. (Jenyns 1862, p. 60.)

^{f4} Tuesday, 26 April 1831 (*LL* 1: 163 n.).

Letter 1015 Darwin to J. D. Hooker

[18 Oct 1846]^{f1}

[Down]
Sunday

My dear Hooker

I shd very much enjoy a walk with you, as proposed, at Kew, but the infamous weather & more especially my utter ignorance how long it will take the artist to do Mr. Arthrobalanus, render it impossible to fix with certainty. I go to London tomorrow & I wd propose to come about 1 oclock & *lunch* with you if you will give me some at West Park,^{f2} & afterwards have a walk in the Garden.— Will you send me a line to “7 Park St Grosvenor Square”,^{f3} telling me honestly whether this will be **perfectly** convenient to you & whether you will allow me to take my **chance** of coming, so that if I do not come by 2. you will know that I have been prevented.

Ever yours | C. Darwin

Many thanks for your note about the Omnibuses.

Footnotes

^{f1} Darwin Correspondence Project » Letter 1015 — Darwin, C. R. to Hooker, J. D., [18 Oct 1846] 9/6/11 10:52 AM <http://www.darwinproject.ac.uk/entry-1015> Page 2 of 2 Dated on the basis of CD’s trip to London from 19 to 23 October 1846, recorded in his Account Book (Down House MS) on 24 October.

^{f2} The Hooker family home, at Kew.

^{f3} The address of Erasmus Alvey Darwin, with whom CD stayed.

Letter 1020 Darwin to J. D. Hooker

[12 Nov 1846]^{f1}

Down Farnborough Kent
Thursday

My dear Hooker

Would you be so kind as to send me a line to say whether you shall be up in London, on next Thursday, Friday or Saturday,, & if you are naturally coming up, will you appoint some hour & day at some place & I will be there: I am anxious to know *at once* whether you will be up, as I have appointments to make for all these days & cannot do so, till I hear from you.—

I believe Arthrobalanus has no ovisac at all!, & that the appearance of one is entirely owing to the splitting, & tucking up to the posterior penis, of the inner membrane of sack.— I have just found a Cirripede with an indisputably abortive anterior penis; so that this chief anomalous feature (viz two penes) in Arthro-balanus is in some degree brought within bounds.—

Ever yours | C. Darwin

The alteration in my microscope, in accordance with your advice, has really been beyond value: the porcupine quills better than the glass tubes; been beyond value: the porcupine quills better than the glass tubes; the Chutney Sauce capital, so that I have many daily memorials of you.

N.B. I have cleverly invented two blocks of wood to support my wrists when dissecting under microscope a splendid invention.

Adios.—

Footnotes

^{f1} Dated on the basis of CD's intention to visit London from 18 to 21 November (see letter to J. D. Hooker, [6 November 1846]).

Letter 1040 Darwin to J. C. Ross

31 Dec 1847

Down Farnborough Kent
Dec 31 /47/

My dear Sir James Ross

I am going to beg a favour of you, which your taste for Natural History, will, I hope, lead you to grant; it is to collect for me, during your ensuing expedition^{f1} & preserve in *spirits* the northern species of Cirripedia or Barnacles, noting the latitude under which found, & whether the coast-rocks are abundantly covered. Perhaps the floating timber may have some of the pedunculated division or Lepas.— I am now at work, & shall be for the next two years, on a Monograph on the Cirripedia; & the above specimens would be particularly valuable to me. I do not suppose that your expedition, considering its noble object, will afford you much opportunity for collecting, but Barnacles are so easily scraped off the rocks & put into spirits, that it would cause you but little trouble. Different species often resemble each other rather closely externally. The only care required is that some of the specimens should have their *bases* perfect & that a few *young* individuals shd. be collected.

I hope, if it be in your power, that you will thus far oblige me, & place this letter amongst your Memoranda.

I do not know, who commands the first ship;^{f2} if he has any taste for Nat. Hist, would you object to ask him to collect some specimens for me in a dry state, (marking the locality) if he object to the trouble of placing them in spirits.—

I trust to your kindness to forgive my asking this favour, & pray believe me, with every good wish for your success in your arduous voyage | Yours very faithfully | C. Darwin

To Capt. Sir J. Ross.—

Footnotes

^{f1} James Clark Ross was preparing for an Arctic voyage in search of the lost Franklin expedition.

^{f2} Francis Leopold McClintock. No specimens from the expedition are cited in *Living Cirripedia*. CD was, however, able to obtain Arctic specimens from John Richardson, Albany Hancock, and Peter Cormack Sutherland, surgeon on several Arctic voyages.

Letter 1253 Darwin to Albany Hancock

[21 Sept 1849]^{f1}

Down Farnborough Kent

Sir

I trust to your kindness to forgive a stranger taking the liberty of addressing you. I have been for the last two years (at least such portions of it, as my health allowed me to work in) employed on a monograph, anatomical & systematic, of the Cirripedia; it was consequently with the greatest possible interest that I heard your admirable paper^{f2} at Birmingham. I made a few remarks on the subject which will perhaps appear in the *Athenæum*.^{f3} In S. America I collected an allied form, parasitic in the *Concholepas* & which probably will be included in the same order with your's, but which I think must certainly form a very distinct family.^{f4}

I was very glad to hear from Mr Taylor^{f5} that your Paper will appear in the *Annals* & then I shall be able to study it.—^{f6} I have no sort of pretension to claim any favour from you, but if you could at any time spare me one or two specimens *in the shell*, preserved in Spirits, it would be the most material kindness.— I would pledge my honour not to publish anything so as to interfere with any further researches you might choose to make on the interfere with any further researches you might choose to make on the species.— No one can be aware better than yourself after your excellent labours on the Mollusca,^{f7} that when one is employed on a Monograph, trifling points are found to be of interest, which are known to be so only to those employed on the class & it is on this grounds that I shd so much like to dissect a specimen of your genus.— I have now dissected species of all the genera of the Cirripedia, & have nearly finished the systematic part of the Pedunculata, but yet from the extreme slowness of rate, at which my health allows me to work, my monograph will not appear for one or two years,^{f8} so that I could not encroach on anything which you might choose to publish further on the subject.

I trust that the great interest, which I have felt in your interesting discovery, will make you forgive my taking the liberty of asking you so great a favour as that contained in this letter.

I beg to remain. | With much respect | Yours faithfully | C. Darwin

To | A. Hancock Esqre.

Footnotes

^{f1} CD returned to Down on 21 September 1849 ('Journal'; *Correspondence* vol. 4, Appendix I).

^{f2} The paper, on Hancock's discovery of a new genus of boring Cirripedia, though read to section D (natural history, including physiology) at the meeting, was not published in the *Report of the 19th meeting of the British Association for the Advancement of Science held at Birmingham in 1849* (see addenda, p. 125). It was published under a slightly different title in *Annals and Magazine of Natural History* (A. Hancock 1849b).

^{f3} *Athenæum*, no. 1143, 22 September 1849, p. 966. The report is reprinted in *Collected papers* 1: 250–1. See also letter to J. D. Dana, 24 February [1850].

^{f4} CD refers to the specimen he originally named *Arthrobalanus* and later *Cryptophialus minutus*. Like

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Hancock's *Alcippe*, CD's barnacle was also a parasite which had the power to bore, and hence he suspected the two were allied. In his comments on Hancock's paper, CD compared *Arthrobalanus* to *Alcippe*: 'Its main affinity to the genus described by Mr. Hancock lies in the number and position of the cirri and the great development of the labrum:— the metamorphosis and organs of generation appear to be considerably different.' (*Collected papers* 1: 250).

f5 Richard Taylor, editor and publisher of *Annals and Magazine of Natural History*.

f6 A. Hancock 1849b. CD's annotated copy is in the Darwin Library–CUL.

f7 Alder and Hancock 1845–55, issued in parts by the Ray Society. CD's annotated copy is in the Darwin Library–CUL.

f8 The first volume of *Living Cirripedia* was published in 1851. It is devoted to the Lepadidae or pedunculated Cirripedia, but the genus *Alcippe* is not described therein. CD did not suspect that *Alcippe* could be included among the Lepadidae until he examined it in 1853 (see *Living Cirripedia* (1854): 526–9, and the correspondence between CD and Hancock early in 1853, *Correspondence* vol. 5).

Letter 1370 Darwin to Syms Covington

23 Nov 1850

Down Farnborough, Kent,
November 23, 1850.

Dear Covington,—

I received your letter of the 12th of March on the 25th of August, but the box of which you advised me arrived here only yesterday. The captain who brought it made no charge, and it arrived quite safely. I thank you very sincerely for the great trouble you must have taken in collecting so many specimens. I have received a vast number of collections from different places, but never one so rich from one locality. One of the kinds is most curious. It is a new species of a genus of which only one specimen is known to exist in the world, and it is in the British Museum.^{f1} I see that you are one of those very rare few who will work as hard for a friend when several thousand miles apart as when close at hand. There are at least seven different kinds in the box. The collection must have caused you much time and labour, and I again thank you very sincerely for so kindly obliging me. I have been amused by looking over two old papers you used in packing up, and in seeing the names of Captain Wickham,^{f2} Mr. Macleay,^{f3} and others mentioned. I am always much interested by your letters, and take a very sincere pleasure in hearing how you get on. You have an immense, sincere pleasure in hearing how you get on. You have an immense, incalculable advantage in living in a country in which your children are sure to get on if industrious. I assure you that, though I am a rich man, when I think of the future I very often ardently wish I was settled in one of our Colonies, for I have now four sons (seven children in all, and more coming), and what on earth to bring them up to I do not know. A young man may here slave for years in any profession and not make a penny. Many people think that Californian gold will half ruin all those who live on the interest of accumulated gold or capital, and if that does happen I will certainly emigrate.^{f4} Whenever you write again tell me how far you think a gentleman with capital would get on in New South Wales. I have heard that gentlemen generally get on badly. I am sorry to say that my health keeps indifferent, and I have given up all hopes of ever being a strong man again. I am forced to live the life of a hermit, but natural history fills up my time, and I am happy in having an excellent wife and children. Any particulars you choose to tell me about yourself always interest me much. What interest can you get for money in a safe investment? How dear is food; I suppose nearly as dear as in England? How much land have you? I was pleased to see the other day that you have a railway commenced,^{f5} and before they have one in any part of Italy or Turkey. The English certainly are a noble race, and a grand thing it is that we have got securely hold of Australia and New Zealand. Once again accept my thanks for your valuable collection of barnacles, and believe me, dear Covington, your sincere friend,

C. DARWIN.

Footnotes

^{f1} See letter to Syms Covington, 30 March 1849, in which CD asked him to send Australian cirripedes. CD referred to four of Covington's specimens in *Living Cirripedia* (1854): 210, 353, 460, 487–90, listing them as having come from Twofold Bay, New South Wales, where Covington had his home. The 'curious' specimen was probably *Catophragmus polymerus*; there was only one other species of *Catophragmus* known to CD. The two species are described in *Living Cirripedia* (1854): 487–91.

^{f2} John Clement Wickham, first lieutenant and CD's shipmate aboard H.M.S. *Beagle*.

f3 William Sharp Macleay. When Covington left for Australia, CD had written a letter of introduction and recommendation on his behalf to Macleay at Sydney (see *Correspondence* vol. 2, letter to W. S. Macleay, 29 May 1839).

f4 The California gold-rush was at its height in the summer of 1850; from the British point of view, inflated prices for gold and the withdrawal of capital from traditional investments such as land, government bonds, and stocks and shares undermined the stability of the economy. CD expressed the same fears about the effects on his investments in *Correspondence* vol. 5, letter to W. D. Fox, 7 March [1852], and on 1 February 1852 recorded in his reading notebook (DAR 128; *Correspondence* vol. 4, Appendix IV): ‘Emigrants Manual’ (Burton 1851).

f5 The first railway in Australia ran from the north bank of the Yarra River to Hobson’s Bay in Melbourne. It was completed in 1854.

f6 This letter was published by Gavin de Beer in de Beer 1959b, pp. 19–20. De Beer’s version, although apparently copied from the *Sydney Mail* text, is not identical to it (see letter to Syms Covington, 30 March 1849, n. 8).

Last ref: 6. Last footnote: 7