Bull. Br. Mus. Nat. Hist. (hist. Ser.) **18**(2): 203–228 Issued 29 November 1990

Charles Darwin's St Helena Model Notebook

Edited by GORDON RUSSELL CHANCELLOR

City Museum and Art Gallery, Priestgate, Peterborough PE1 1LF

CONTENTS

INTRODUCTION

Charles Darwin (1809–1882) is beyond question one of the most important figures in the history of science, and as each year passes our appreciation of his importance seems only to increase. At the present time students of Darwin's life and work are being treated to a definitive edition of his *Correspondence* (Burkhardt & Smith, 1985–) and there recently appeared a similarly definitive edition of his theoretical notebooks (hereinafter referred to as *Notebooks* (Barrett, Gautrey, Herbert, Kohn & Smith, 1987)).

It will take historians a long time fully to assimilate all this new material into their understanding of Darwin and the milieu in which he worked. Nevertheless, there is now a clear consensus that he became an evolutionist ('transmutationist' being the word he would have used) in the spring of 1837, within six months of his return from the voyage of the *Beagle*. It is also established that he constructed his theory of natural selection in the autumn of 1838, elaborating it and working out most of its radical implications during the winter and spring of 1839 (see *Notebooks*). Twenty years were to elapse, however, before Darwin published *On the Origin of Species* (1859), and in the intervening period few people were allowed to know the conclusion to which his work had led him. With the full publication of Darwin's *Correspondence* and *Notebooks* we can now, for the first time, trace his path to natural selection—and beyond—in as much detail as the documentary record will ever allow.

There is one small Darwin notebook, omitted for practical reasons from the *Notebooks*, which Darwin seems to have kept about his person for 'on the spot' jottings throughout the important last few months of 1838. This notebook has become known as the 'St Helena Model' notebook, because these words are written on its cover, and because it contains notes concerning a model of the island of St Helena. This notebook

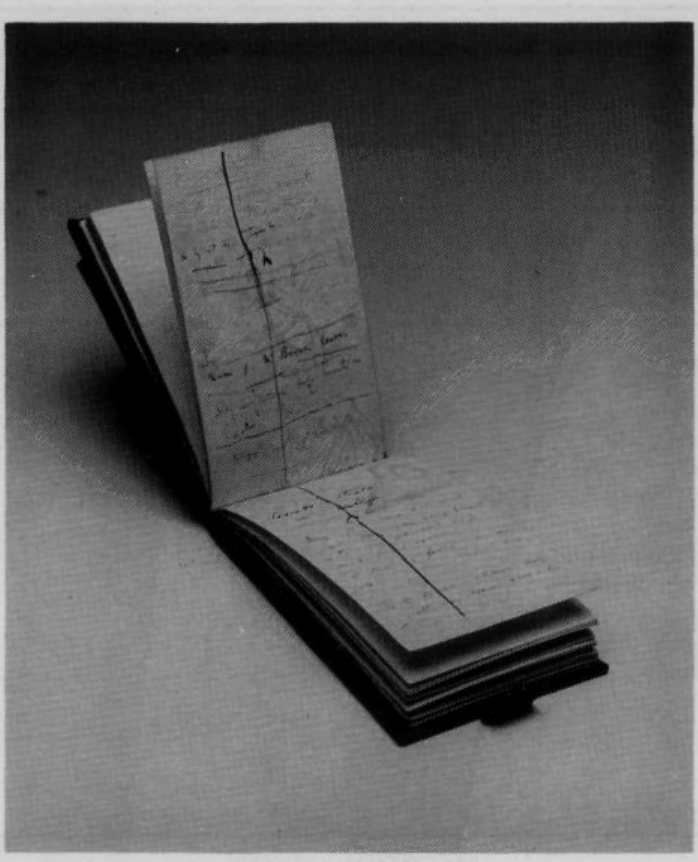

Fig 1 The 'St Helena Model' notebook of Charles Darwin, open at pp. 26–7. Courtesy of the Royal College of Surgeons.

must, however, have had a greater meaning to Darwin, as it records many of his thoughts relating to variation, breeding and so on, albeit in telegraphic style. Most of these thoughts are much more fully expressed in the *Notebooks*, so that the St Helena Model notebook assumes an importance as the first medium available to a thinker who was eager not to forget the details of some observation or to lose the thread of a conversation before he could get home to his private study. Unfortunately twenty-one of the original fifty pages of the St Helena Model notebook have been excised—presumably by Darwin—and none of these excised pages has yet been found. This is all the more regretable because it was probably the theoretically most interesting pages which were excised.

In spite of its fragmentary nature the St Helena Model notebook is worthy of publication. Much remains in the notebook of interest to those studying Darwin's work as a geologist at the time when he was entering the élite of London scientists (Rudwick' 1982), but perhaps its greatest charm lies in the glimpse it gives us of the daily thoughts and activities of a young genius at the most creative period of his life. In the weeks leading up to his marriage and election to Fellowship of the Royal Society, even Charles Darwin had to think about laundry and the problems of moving into a new address: 'Two easy chairs—Blinds in Red Rooms washed—Muslin all to be washed' (p.31x).

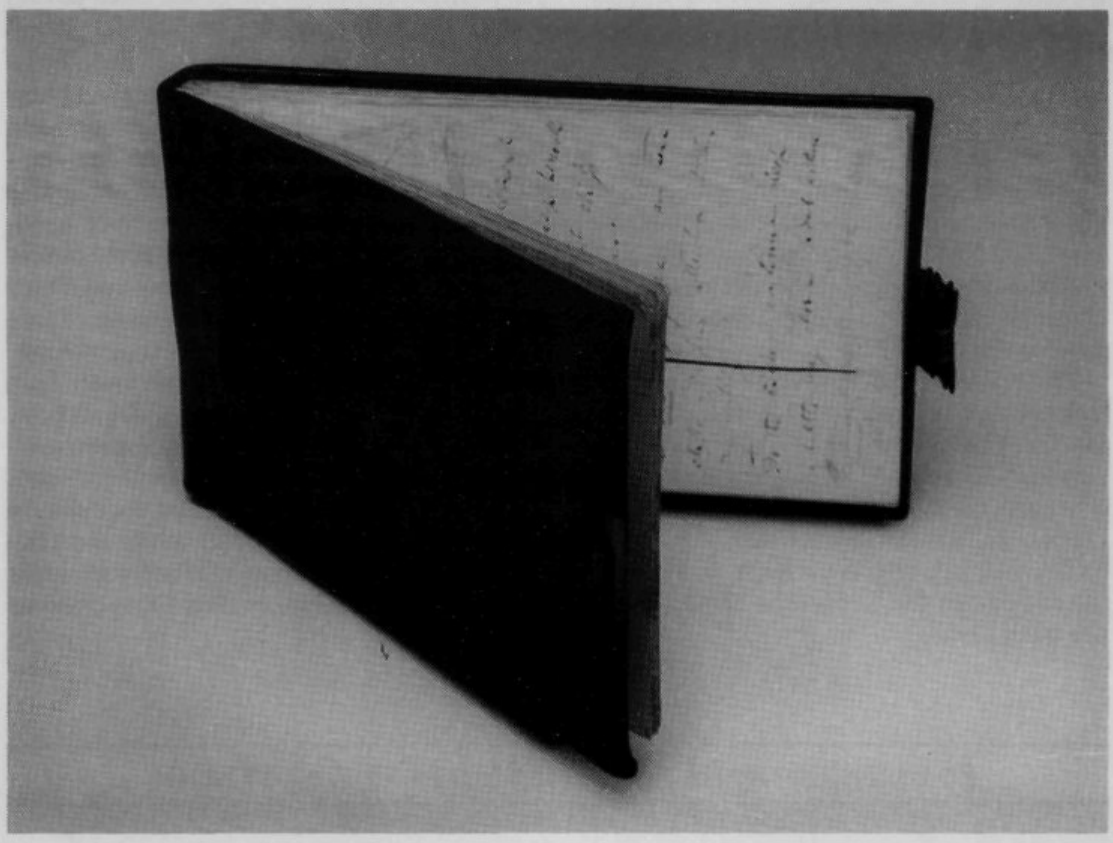

Fig 2 The 'St Helena Model' notebook of Charles Darwin. Note the writing on the front and the orientation of the brass clasp. Courtesy of the Royal College of Surgeons.

THE NOTEBOOK

The St Helena Model notebook was briefly described and partially transcribed by Nora Barlow (Darwin's grand-daughter) in her *Charles Darwin and the Voyage of the Beagle* (1945: 255). Lady Barlow noted that Darwin had written 'Nothing' and 'St Helena Model' in bold, thick ink on the red leather cover of the notebook (see Figs 1–2), which measures approximately 7cm × 11cm and is very similar to the smallest of the pocket notebooks (referred to as 'field notebooks' in *Correspondence* 1: 545) used by Darwin during the *Beagle* voyage, with which it is now kept on display at Down House.

The surviving pages of the notebook were written almost entirely in pencil, except in a few cases where I have indicated that ink was used. So far as I can tell, none of the ink used is of the grey variety which is to be found in some of Darwin's other notebooks from this period (*Notebooks*: 14). Darwin seems almost always to have written 'down' the page, that is to say holding it with the hinge (which is 7cm long) oriented horizontally. We may imagine therefore, that the notebook was carried at all times by Darwin, ready to be jotted in whenever occasion arose; in this sense the notebook is equivalent to one of the pocket notebooks used during the *Beagle* voyage, and differs from the *Notebooks* which are essentially of post-voyage date. Evidence for dating of passages in the notebook is discussed further below; the bulk of the entries date from September to

December 1838, although there is one reference (written in ink on the inside back cover) dated 1839.

The front end paper of the notebook has the number 1.5 written in the top right hand corner, in heavy pencil, in an unknown hand; this is the notebook's Down House catalogue number (see *Correspondence* 1: 545). The front end paper is also inscribed in the bottom left hand corner, in pencil, with a number 15 in which the 5 is written over a 6. This number 15 is uniform with a series to be found in each of the other Down House notebooks which reflect the approximate chronological order in which they were used. The 'Red Notebook' (*Notebooks*: 17–81) is numbered 16 in this series, but in fact entirely predates the St Helena Model notebook. I am informed by Sandra Herbert and Peter Gautrey that this second series of numbers is in Nora Barlow's handwriting. Since neither the 1.5 nor the 15 are in Darwin's hand they are omitted from the present edition.

The pages of the notebook were not numbered by Darwin and because he wrote in it from both ends inwards, I have numbered the pages in two sequences, pp. 1–64 and pp. 1x–32x. I refer to these two sequences as the front and back of the notebook respectively, although there is no real evidence that one was started before the other. As can be seen, however, from Figures 1–2, the notebook has a hinged brass clasp similar to ones on Darwin's other surviving notebooks, in almost all of which the hinge of the clasp is on the back cover (clearly the easiest arrangement for a right-handed person). I therefore refer to that end of the St Helena Model notebook which bears the hinge of its brass clasp as the back end.

EVIDENCE FOR DATING ENTRIES IN THE NOTEBOOK

There is only one reference in the notebook as it survives today which is actually dated, and this is the 1839 reference mentioned above. All other entries in the notebook must, therefore, be dated from internal evidence and by comparison with other Darwin manuscripts which can be dated. Broadly there are three more or less distinct sections of the notebook, each of which can be dated in this way.

Firstly, the text from p. 1 to p. 15 forms a discrete essay on the geology of the island of St Helena, based on examination of a large model of the island. The evidence for dating this essay is given in more detail below, but suffice it here to say that it seems to have been written at one sitting, on or about 15 September 1838 (which was a Saturday). Just possibly this essay was written a few months before this date, following a conjectural earlier examination of the model. Darwin himself seems to have treated these first fifteen pages of the notebook as a separate entity, to judge from the pinhole through them.

Secondly, the texts from p. 16 to p. 48 and from p. 5x to p. 29x are almost entirely concerned with the many geological and biological problems that Darwin was examining in the latter months of 1838. There are numerous entries on these pages which have close parallels in the *Notebooks*, the dating of entries in which can often be stated with certainty, not least because Darwin dated many of them himself. Whilst all such parallel references to the *Notebooks* which I have found are given in the notes which follow the text, I give here the most closely datable pages against the corresponding *Notebooks* pages (in parentheses) and dates:

p. 22 (D40) between 19 and 22 August 1838
p. 41 (M142) between 13 and 15 September 1838
p. 46 (D105) 13 September 1838

p. 47 (D100) 13 September 1838
p. 48 (D108, 112) 14 to 16 September 1838
p. 29x (D163) 25 September 1838.

Clearly, most of the references support a dating for these pages to September 1838.

Thirdly, the texts from p. 59 to p. 64 and from p. 30x to p. 32x (i.e. the last entries in the notebook) are concerned with house hunting in London. In Darwin's pocket 'Journal' which (as Sandra Herbert first pointed out in 1977: 208) seems to have been first used in August 1838, there is the following entry for 1838 (see *Correspondence* 2: 432): 'To the end of year House hunting'. Darwin took possession of the keys to 12 Upper Gower Street on 29 December 1838, so that one can say with reasonable confidence that these entries date from late November to December 1838.

THE ST HELENA MODEL AND DARWIN'S CRATER OF ELEVATION THEORY

As noted above, the first fifteen pages of the notebook form an essay on the geology of St Helena, and the words 'St Helena Model' are written on the notebook's cover (see

Fig 3 Map of *The Island & Forts of St Helena* (c.1815), scale of 2 miles = 1.75 inches, 25cm × 19cm. Courtesy of the Syndics of Cambridge University Library. (CUL Maps 546.81.1).

Fig. 3). In order to date this essay and to establish its significance, it is necessary to review Darwin's manuscript record concerning St Helena.

When H.M.S. *Beagle* visited St Helena in July 1836, Darwin took the opportunity to make a detailed examination of its geology, recording his observations in Down House notebooks 1.3 and 1.6. Aboard ship Darwin wrote up his personal diary, which is also today preserved at Down House, and sorted out his geological specimens, which are listed as numbers 3700–28 in the third of four catalogue notebooks which are now on deposit at Cambridge University Library. He also wrote up his detailed geological notes on paper watermarked Wilmot 1834; these notes are now at Cambridge University Library, DAR 38ii, ff. 920–35. At some point before the *Beagle* reached England, Darwin made some notes on St Helena in his Red Notebook, the most extensive being those on pp. 38–40, which he subsequently excised and are now in DAR 42, f. 84 (see *Notebooks*: 31).

While Darwin's servant and amanuensis Syms Covington was making a fair copy of his master's personal diary, probably in the early months of 1837, for eventual publication as *Journal of Researches* (hereinafter referred to as *JR*), Darwin prepared an additional section on the geology and natural history of St Helena. This section appears on pp. 581–3 of *JR*, but as Nora Barlow pointed out in her edition of the personal diary (Barlow, 1933: 439n58) the manuscript of this section appears to be lost, and cannot therefore be precisely dated.

In July 1837 Darwin opened the first two of his post-voyage *Notebooks*. Notebook A was devoted to geology, notebook B to species. Notebook A contains a reference to St Helena on p. 41: 'The fact of Galapagos Isld. steep side to windward in allusion to St. Helena discussion.' (*Notebooks*: 96). This note is on an excised fragment now in DAR 42, f. 25, which can be dated approximately to November–December 1837 (*Notebooks*: 83).

The next datable manuscript dealing with the geology of St Helena is a single sheet of Eyehorn 1837-watermarked paper, bound near the back of DAR 44. The recto of this document is dated 15 September 1838, and headed 'St Helena Model'; it is written in pencil with a few ink annotations and concerns the topography of the north-west and north-east coasts of St Helena. It is written in a similar style to, and clearly overlaps in subject matter with the first fifteen pages of the St Helena Model notebook. Both documents seem to have been written during or immediately after examination of the 'gigantic model' of St Helena, which we know Darwin saw at the East India Company's Military College at Addiscombe, which is now part of Croydon in Surrey (see Darwin 1844, hereinafter referred to as *VI*: 75 footnote; 1846, hereinafter referred to as *GSA*: 25). This dating for Darwin's work on the model is substantiated by a letter he wrote to an unknown recipient dated 12 September {1838}, in which he asks permission to examine the model, having apparently seen it 'some months since' (*Correspondence* 2: 103).

The model itself, which I have not been able to locate and which probably no longer exists, was constructed by Robert Seale, author of *The Geognosy of the Island of St Helena* (Seale, 1834).

The verso of the DAR 44 manuscript, reproduced here as Figure 4, is an inked-over pencil diagram showing cliff formation on the north-west coast of St Helena. It is clearly developed from the diagram on p. 38 of the Red Notebook, and via various intermediate states preserved in DAR 39ii was published in the section on cliff formation in *GSA*: 25–6; (see also *Notebooks*: 31n38–4).

The remaining manuscripts which deal with the geology of St Helena are a series of pencilled notes written, like the DAR 44 sheet discussed above, on Eyehorn 1837 paper and preserved as DAR 42, ff. 94–7. These too are mainly concerned with the subject of coastal erosion and they may well have been written at the same time as the DAR 44

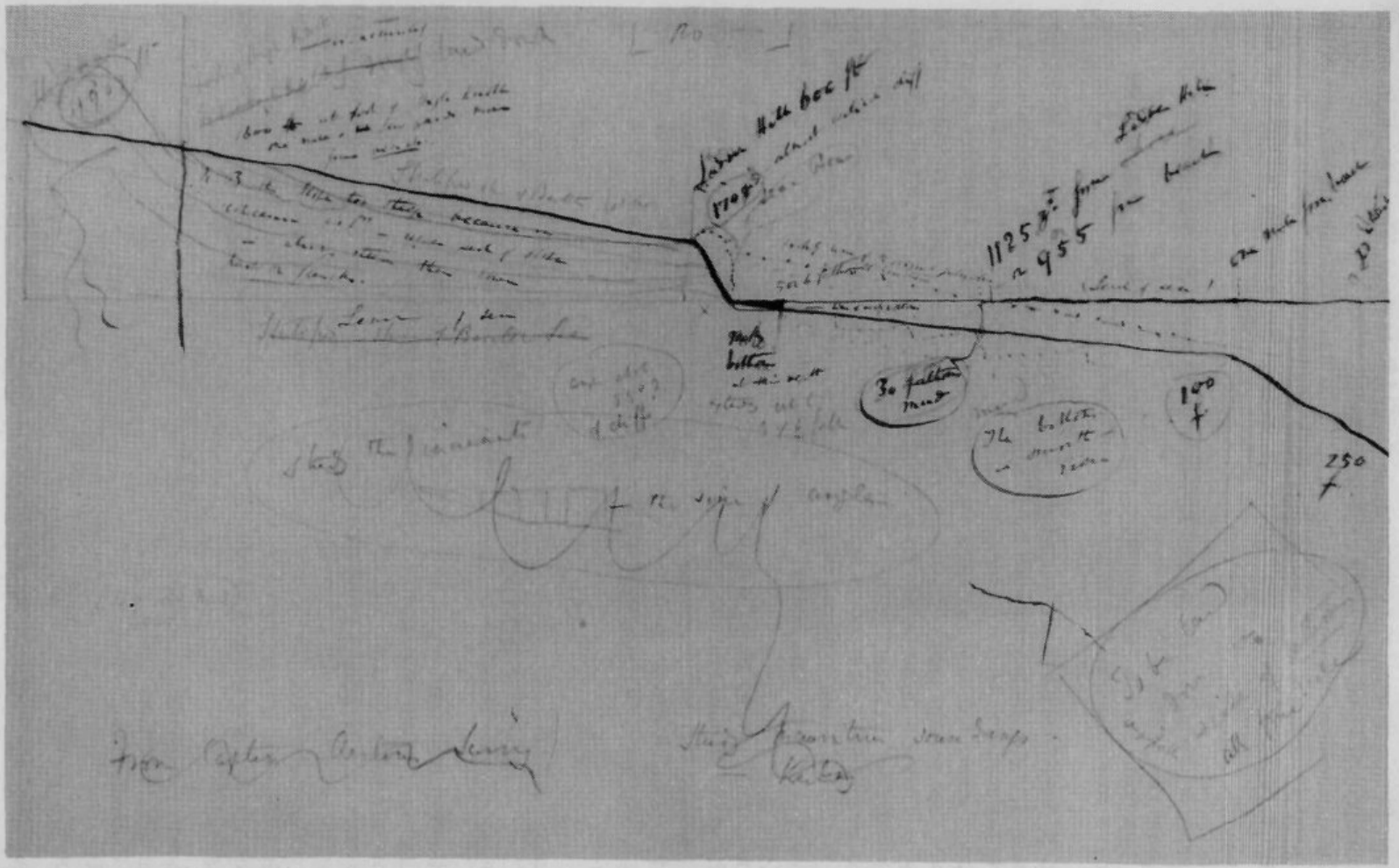

Fig 4 The verso of an unnumbered folio in DAR 44, dated 15 September 1838, which shows a section through the coastline of St Helena. The diagram appears on p. 25 in *GSA*. Courtesy of the Syndics of Cambridge University Library.

note. The geological notes in DAR 38ii are in places heavily annotated in pencil which may also have been written at the same time as the DAR 44 sheet. There is a light pencil note in the margin of DAR 38ii, f. 93l to 'V[*ide*] Model'.

There is one other line of evidence to support the dating of the first fifteen pages of the St Helena Model notebook to 15 September 1838 or thereabouts. This is the evidence from Darwin's pocket 'Journal' (see above, p. 207) of his scientific activities at that time:

> September 6th Finished paper on Glen Roy—one of the most difficult & instructive tasks I was ever employed on
> Sept. 14th Frittered these {foregoing days *added*} away in working on Transmutation theories & correcting Glen Roy Began craters of Elevation Theory

Burkhardt & Smith (1987, *Correspondence* 2: 436n24) were not able to locate any manuscript by Darwin dealing with his novel explanation for the form of islands such as St Jago, Mauritius and St Helena. Darwin published his 'Crater of Elevation theory' in a special section appended to the chapter on St Helena in *VI*: 93–6. Darwin's theory, in essence, was that certain types of volcanic islands which consisted of an outer ring of mountains, enclosing a more or less level inner plateau, were the result of differential uplift, with the inner area less elevated than the outer ring of mountains. Such islands—referred to by previous authors as craters of elevation—would otherwise have been explained as resulting from collapse of the inner area following blister-like elevation, or by postulating that the central part of the island had been destroyed by volcanic explosion.

In my opinion, knowing that Darwin began work on the theory on almost the same date that he made his notes on the model of St Helena, we may identify all the Eyehorn 1837-watermarked manuscripts itemized above, and possibly also the annotations to the *Beagle* notes on St Helena, together with the essay at the start of the St Helena Model notebook, as Darwin's surviving manuscripts on 'Craters of Elevation'.

EDITORIAL CONVENTIONS

In the following transcription of Darwin's 'St Helena Model' notebook the original spelling and punctuation have been retained, together with the horizontal lines Darwin drew across the page to mark off pieces of text. All other markings, such as vertical cancelling lines and marginal scoring have been ignored. Notes to the text are indicated by superscript numbers. All editorial matter is included in square brackets and is italicized. Page stubs have not been transcribed. It should be noted that there are no obvious annotations in this notebook, in the sense of text added much later than the main body of the text. This is in marked contrast to some of Darwin's other notebooks (see *Notebooks*: 12).

‹ › Darwin's deletion
‹‹ ›› Darwin's insertion
bold type written in ink
illeg illegible
/– –/ doubtful reading

Page numbers are given in square brackets. Excised pages are signified by the notation 'e'.

ACKNOWLEDGEMENTS

My thanks are due especially to the Royal College of Surgeons, for allowing me to publish the 'St Helena Model' notebook, and for agreeing most generously to depositing the notebook temporarily at Cambridge University Library so that I could work on it there. It is a pleasure also to acknowledge the help I received at Cambridge from Mr Peter Gautrey, whose ability to read Darwin's handwriting has aided my task a great deal, but who is in no way responsible for the accuracy of the present edition. I am grateful also to Dr Sandra Herbert of the University of Maryland, who has greatly improved my work at several stages and encouraged me to complete the project, as has my partner Allison Butt. Finally I thank the Syndics of Cambridge University Library for permission to quote from manuscripts in their care, and for providing the illustrations for this paper.

[FRONT END PAPER[1]]

[1] An Elevation inter=
=mediate between
Longwood[2] &
Alarm house[3]
will give
mean inclination
of stream before
elevation at
Flagstaff[4]

---

[2] /–Bluimans–/[5] probably
modern lava.

Horse pasture[6]
island slopes
impossible to guess
what it is

High Hill[7]. I
should think external
‹‹a ‹little› more elevated then rest
of ring››
/–Vide–/ basalt & V[*ide*] specimens

[3] *Hollow* ‹‹on coast›› near Man
& Horse[8] I should ‹‹certainly››
think end of ‹‹?capped with
/–Lava–/ & elevated ?››
external ring: to

The S. [*illeg*] Is
like inside of
Crater.

/–Evidently–/ great
/–remnant–/ near
Flat Rocks.[9]

[4] ?‹‹very doubtful›› Whether any
old rocks near
Flat rocks?

Asses ears[10] so very
near coast

South Barn[11]
I should think
Basaltic, as well
as Long Range
point[12] × × ×

[5] Cuckolds point[13]
2672

Hally's Mount[14]
2400

According to
colouring, base of
Man & Horse[15]
‹external› basaltic

× × × × & I can
scarcely doubt great

[6] Stone top[16] ‹‹is likewise basaltic››

High Hill[17] most

anomalous

Part of Barn[18]
nearest to Flagstaff[19]
higher than seaward
point from
elevation –

The form of South

[7] Barn[20] would lead
to supposition that
it dipped to SE by
S. –

If we complete the
crater‹s› /–by–/ Green Hill[21]
/–to–/ Nest [Lodge *written over*
'Loge'][22], the
longer axis will be
parallel to S. Coast
as /–rise–/ of Green

[8] Hill is nearly obliterated
We need not be surprised
at SW part of
circle being entirely
obliterated

The /–state–/ of outer
/–ring at–/ (/–true–/ SW)
point, is quite
doubtful.·. cause
of dip of S Barn[23]
doubtful. –

---

[9] Excepting from
disturbance at the
/–?–/ Barn[24] axis of
Crater parallel to
island. –

New crater placed
rather at one
end of ring of
Rocks

Lot. Lots Wife[25] &
& Flagstaff[26] in line

[10] connection true
or false?

The tops of
basaltic masses
stick up
above the modern=
strewn all round
a little higher

---

[11] The lava of Flagstaff[27]
did not proceed
‹over› from so
low a place as
‹Consons› Casons Gate[28]

When I talk of
dip from High
/–Peak[29] *have–/ I said*
SW for NW!!!??

[12] The irregular
position of the
external /–knobs–/,
/–would certainly–/
appear more
probably due to
elevation, than
‹‹to›› crater of subsidence

Appears to have

[13] less regularity,
than true crater
tho' having
crateriform
dip

Prosperous Bay[30]
Flagstaff ought[31]
to have dipped
due E.

[14] Barn[32] NE
ought to have
dipped

South ‹‹Barn››[33] ought to
have dipped
S by E

From black angular

[15] projecting ‹‹mass›› at base
of Man & Horse[34]
no doubt external
basaltic, but
top too smooth
I must suspect
structure like
Flagstaff[35]

---

[16] Dr Lind/–stay–/[36] Curator

Ask Gould[37] about
East Indian & Australian
Birds. with respect
to /–islets–/[38]

Eyton[39]—Waterhouse[40]
think/–s grey–/ with black
bars cat differ species
from small tortoise=
shell cat[41]—skeletons
Do get shepherds tail

[17e–20e]

[21] Sulivan[42] get head of
ox called "Nata"[43]

History of cross breeds

Gould drawing of
ostrich[44]

D'Orbigny[45] is giving
figure shells from
Cordillera[46]

Ear Doctor[47]

---

[22] Tell Lyell[48] of Desnoyers
Paper[49]

Tell Mr Owen[50]
of Caout chouk[51]
to stop bottle

There are some
admirable tables
of distribution of
reptiles of ‹S. America›
/–bound–/ in Suites
de Buffon[52], of

[23e–24e]

[25] /–Wrappers–/ ??
about sending to Subscribers[53]

Stewart[54] about payment
of the 100 guineas
for Gould[55]

Curtis[56] my bill

Dr Smith[57] sharks
teeth Navedad
Chile

/–will examine them
hereafter–/

[26] Major Mitchell[58]

Height of Escarpment
of Blue Mountains
‹‹do hybrid dogs ‹foxes› /–Austral–/
dogs. breed.–[59]››
Depth of rivers near
mouths[60]

Any Fossils /–in the–/ Sandstone[61]
/–Pecten Terebratula–/

Name of Mr Brown[62] leaves[63]

Do Australian dogs hunt in
packs[64] /–Watuaya–/

Woodcut of Bomb[65]

[27] Pay Lonsdale[66] Geolog
Transactions
Pseudo-strata.
-craters.

? May I quote your statement

about steep shore deep beneath water.[67] **find out about cliffs on banks of rivers.**

At *Head* of /–Grose–/ are there cliffs & confine attention to this *one* valley yes
Do the rivers continue deep a little way above tidal action ‹‹no cliffs›› /–Look out for shells with bones not always cliffs–/

[28] [*two illeg words*]
Henrietta /–St–/ Bath[68]
would probably answer letter
& give information
about tailless breed of
cats[69] (origin?) near
Walmesbury breed??

Wiltshire sheep. with
teeth pushing each
other out
Plants from Henslow[70]

Sulivan[71] about
English Weeds
Fennel, Sow Thistle
/–Reach—/

[29e–34e]

[35] Council of
Geolog Soc
for map of
Scotland

Dunford field
/–Church–/ St

/–Last–/ number of Lancet, account of Owen & Magnetism[72] [73]

[36] Vol. VII Ed. T.
p.157[74] Sir J Hall
states that "a ‹‹large›› block
of ‹rock› ‹‹stone›› 4 or 5 ft
in diam, lying within
high water mark, &
well known as ‹‹having›› serving
to denote the boundary
of two estates was
/–during–/ a stormy night
in water transported
90 yards, & the person
on the /–spot was confused–/

[37e–40e]

[41] all preserving their
NE dip

Miss Martineau p. 213[75]
Charity everywhere
‹‹I doubted it at first›› Byron & the
Fuegian women Have any

---

other associated animals
charity—cows not
wild cattle & [*illeg*]

[42] Wouett on Cattle[76]
Waterhouse, has it[77]

Ask [**Fox**[78] *ink over pencil*] to
experimentise[79]
on Frogs spawn & to
procure eggs of
Land Snail, for me—

Owen's Edition
of ‹‹**Hunters's**›› Animal
Economy[80]

[43e–44e]

[45] n.b.

Pintail & Common
Duck to get
some half /–breed–/[81]

Bring Picture
for /–M–/

Cross between Black
Grouse Ptarmigan[82]

Pheasant & Grouse in[83]
wild—when species decreasing

[46] Capercailzie[84]

Black Grouse &
subalpina[85]

Anthus S. American
species.– furthest
south—Anthus
going further ‹South› ‹‹North››
than S. American
species[86]

---

[47] Mr Yarrell[87] 3″6d

---

for number of
Physiology[88]

Mr Yarrell [1765 *written over '1780'*],
has book history of
Pidgeon.[89]

Treatise on Domestic
Pidgeons—very
curious, in comparison
for time,—Mr Yarrell
has /–recent–/ comparison

---

[48] Has rock Pidgeon
‹pouter's› specks on
shoulder, Pouters
have specks[90]

Have any new
varieties of Pidgeons
been established?[91]

There must be laws of
variation chance would never
produce feathers or make
breed—[92] ?cat without legs?[93]

[49e–58e]

[59] /–modesty [‹‹*two illeg words*››] &
shame–/
Mr Fuller 8 Albany
Place — /–11–/ Regent
Park — 200£[94]

Albany St. 70£.
per annum
no 161 — 100£ per annum

Another further up
this street 80£
no 27

---

[60] Clarges St.–

Montague Place
House. Parker
Keppel St Agent
Furnished

Kemp & Son
37 Judd St.
House in Woburn
Place—no 20

---

[61] Pearsall & Jorden
1. Bernard St
Russell Square
House in do

---

12 Upper Gower[95]
St. Furnished or
unfurnished. ‹‹must be latter››
Furniture
at Valuation? Pearsall
& Jordan: 100 year
with *stables:* 4 years–

[Will hear on Tuesday from France
written up left margin]

[62] Mr Stokes[96] 4
North Place
Gray Inn Lane

Gordon Square
40
Built /–two–/ years

‹Upper› ‹‹20›› Woburn Place
bare, (with fixtures
some) want some
painting ‹‹Landlord probably will
do no more›› rather
nice house –

[63] offices rather bad.
look out /–believing–/
moderately good
140 Kemp &
Son [37 *'3' written over '2'*] Judd St
with stables

---

17. Woburn Place
to Purchase Furniture
rent 110 Lease 7 or
14

[64] Tavistock Square[97]
2 houses from–
near Mr /–Crompton's–/
145£: New
House belonging to Cubitt[98]

Regent Square.

[INSIDE BACK COVER]
2/6
Lyell[99]
Geograph Journal
1839 p. 288
Subsidence
at Tyre[100]

[Back end paper excised]

[1xe–4xe]

[5x] by seeds or not? & what
will it go back to?

Give Miller[101] a
hint, about specimens

[378 yellow *encircled*][102]

Von Hoff translated??[103]

Take the passage
& see about my mistake

[6x] Lonsdale: S. American
Fossils?[104]

Correction for Lyell
in little Book[105]

Lyell Vol.II Poggendorf
Annalen about Albite
ask /–Lyell–/ to look[106]

‹[*illeg*]›

Earle[107] Tristan D'Acunha[108]

Mr Whewell[109] depths at
which sea breaks[110]

[7x] Cone of Tree from Chile[111]

Mr Brown/–e–/
Bomb[112] [‹‹cannot find it››
+ Mark of Tree *boxed*] –
Is Australian wood coniferous[113]
[‹‹**yes all I brought**›› *ink over pencil*]
‹‹nearly all filled with agate /–Red
Jasper–/ does not››
+Norfolk Isld
Macquarie Is??

---

where can I get account?

Australia & S. America
at all allied Flora.

Wild dogs on West Coast
See 1/–st–/ Vol of Geograph
Journal[114]

Bog Iron ore
infusoria[115]

Fern ‹‹of Australia›› being found in
India.

Ask directions about good
lens in Paris.–

[8x] Lyell flint in Potteries[116]

Owen tooth in Sir Woodbine's[117] possession[118]

[9xe–10xe]

[11x] Vol III p. 30 Lyell[119] wrong about P. vulpina Waterhouse

---

?Type? size for Zoological

Ask Baillière[120]

Roget, Bridgewater[121] Treatise

Translation of Muller[122]

[12x] Ice transport of storm in Frith of Forth p. 157 VII Vol ‹‹& 8th›› Edinburgh Transact[123]

Have they ‹‹a›› Leucopterus from Falkland Isd at Brit Museum for comparison with those from T del Fuego brought by King[124]

[13xe–18xe]

[19x] Ask Dr Smith thickness of sandstone at C. of Good Hope[125]

How high is the capping of sandstone on Lions Head 2100ft above sea

---

Corvus do Mar for Henslow[126]

[Whether litters of true hybrids are heterogenous or homogenous *written upside down*][127]

[20x] Dr Smith[128] /–Quartz–/ Rock. no formation of ?? with respect to origin of sandstone[129]

Granite large Formation????

Ask Lonsdale[130] about ‹‹stalagtite layer on›› Chalk & look at [*three illeg words*]

(with the exception of some quartz Hills on ‹near› the West Coast near the mouth of Orange River) Dr Smith.–[131]

[21xe–22xe]

[23x] Tooth of Mastodon[132] for Merchant

Sonnerat[133] has given account of Seychelles Voyage aux Indes Orientales 1774 1781 Gould[134] has seen Parrot

---

[24x] /–Cheiroptamus–/[135]

Exact Locality

Cast

Sir P Egerton[136] says that Kaup[137] considers M. augusti= dens[138] as only found in India– European species ‹come from› are M. longirostris

---

[25x] Jaw of Elephant in Geolog Soc

Edin Transacts Vol. VI p 165[139] considers Somma is fragment of large volcano Sir J Hall

---

do p. 173[140] Has seen clay stiff enough for potters use with /–great–/ crystals of ice /–found–/ in them, & fragments of rock, with angles ‹stay› sharp, yet with [character completely altered & *two illeg words* superinduced *written up right margin*]

[26x] Edentate Head. one plate[141]

Mastodont one plate

---

4 Plates
2 Plates for little bones

---

1 Tessalated covering
6 Scelidotherium
1—Lower jaw
1 Megatherium
1 && [18 *boxed*] 2″18

[27x] Theory of Volcanos ‹‹/–Count–/›› Byelandt Palstercamp[142]

Rat from Australia??[143]
Owen– fossil –[144]

Shall I give Institute /–d'–/France Mammalia[145]

Lyell Volcanic Dust[146]

[28x] /–Macaio–/
Is there any relation between boss of Indian cattle & structure Bison &c[147]

Analyse this in all cases whether *variation* /–assumes–/ character allied to specific ones same genus —

[29x] **Write to Sulivan[148] to enquire about wild ‹‹Have they long ears & what colour??›› dogs on the Pampas**

Do male animals lose passion from breeding in & in.–[149]

How many generations was this effected in case of Bantam & Polish Cochin[150] in Pidgeons how many generations old on an average[151]

[Vertebra of Indian Cattle *ink over pencil*]**[152]**
Eyton. dissect.–[153]

Skeletons of Pidgeons
1/2 one. 3. oclock
1/4 . 1 . 1/2 past one

[30x] Pay Lyell[154]for Pritchard[155]Chemical Co/–ncre–/ tions
Volcanic Dust[156]_____
Remnants of Carpets[157] Mat for Hall
Windows cleaned
Staircase cover washed
Walls cleaned
white curtains washed

[31x] Two easy chairs

Blinds in red
Rooms washed

Muslin all to be washed

[Lyell[158]

T. Carlyle[159] – Public Library

Flint in Pottery
——*written upside down*][160]

[32x] Common table &
2nd Washing stand

Lyell[161]–Maclarens[162] has written on Salisbury Craigs

NOTES

Biographical notes are adaptations of those given in the *Correspondence*.

1. There are five lines of illegible very feint words written on the inside front end paper.
2. Longwood (elevation 1760′) was Napoleon's residence on St Helena; it is located in the east-central part of the island (see Cross, 1980).
3. Alarm House (elevation 1960′?) is approximately 1 mile west of Longwood.
4. Flagstaff Hill (elevation 2275′) is on the north-east coast, overlooking Flagstaff Bay.
5. Not identified.
6. Horse Pasture is a large sloping area about three miles south-west of Jamestown.
7. High Hill (elevation 2314′) is about two miles south of Horse Pasture.
8. Man and Horse is a high cliff area at the south-west corner of St Helena.
9. The Flat Rocks are two of the islets off the southern tip of St Helena.
10. The Asses Ears (elevation about 1660′) are two peaks at the the southern tip of the island.
11. South Barn is presumably Sandy Bay Barn (elevation 1413′) which is in the centre of the south coast, on the eastern side of Sandy Bay.
12. Long Range (elevation 1936′) and Long Range Point are on the south-eastern edge of Sandy Bay.
13. Cuckholds Point (elevation 2672′) is in the centre of the island, on the northern rim of Sandy Bay.
14. Halley's Mount (elevation 2200′) is halfway between Cuckhold's Point and Alarm House. It was from this point that Edmund Halley observed the transits of Mercury and Venus in 1676.
15. See note 8.
16. Great Stone Top (elevation 1620′) is near the south-east corner of the island.
17. See note 7.
18. The Barn (elevation 2019′) is at the north-west tip of the island.
19. See note 4.
20. See note 11.
21. Green Hill (elevation 1650′) is about 1 mile south of Cuckhold's Point.

22. West Lodge (elevation 2200′) is about 1 mile east-south-east of High Hill. Darwin both here and in *VI* refers to it as Nest Lodge.

23. See note 11.

24. See note 18.

25. Lot (elevation 1489′) and Lot's Wife (elevation 1516′) are peaks in the interior of Sandy Bay.

26. See note 4.

27. See note 4.

28. Casons Gate has not been located.

29. High Peak (elevation 2616′) is about 2 miles east of High Hill. Darwin's question to himself here almost certainly relates to his *Beagle* notes (DAR 38ii, f. 929).

30. Prosperous Bay is on the north-east coast of St Helena.

31. See note 4.

32. See note 18.

33. See note 11.

34. See note 8.

35. See note 4.

36. Not identified.

37. Gould, John (1804–81). Self-taught ornithologist and artist. Taxidermist to the Zoological Society of London, 1826–81. Described the birds collected on the *Beagle* expedition (Gould, 1838–41). FRS 1834.

38. Related matter appears in B249.

39. Eyton, Thomas Campbell (1809–80). Shropshire naturalist and collector of bird skins and skeletons. Friend and Cambridge contemporary of Darwin.

40. Waterhouse, George Robert (1810–88). Naturalist. A founder of the Entomological Society, 1833. Curator, Zoological Society of London, 1836–43. On staff of the British Museum 1843–80. Described some of Darwin's entomological specimens from the *Beagle* voyage (see Smith, 1987) as well as the *Beagle* mammals (Waterhouse, 1838–9).

41. 'Waterhouse thinks two main divisions of cats. Tortoise shell & grey-banded. ?species?' B250.

42. Sulivan, Bartholomew James (1810–90). Naval officer and hydrographer. Lieutenant in the *Beagle*, 1831–6. Surveyed the Falkland Islands, 1836–46 (Moore & Scannell, 1986). Admiral 1877.

43. Nata cattle are described in *Variation* 1: 89–91. They may also be the subject of a manuscript Darwin sent to George Robert Gray in December 1838 (see *Correspondence* 2: 136).

44. Almost certainly a reference to Gould's illustration of Darwin's Rhea, *Pterocnemia pennata* d'Orbigny, which was published in Gould (1841).

45. D'Orbigny, Alcide Charles Victor Dessalines (1802–57). French palaeontologist who travelled widely in South America, 1826–34.

46. Probably a reference to the figures of South American fossils which appeared in the 'Atlas de la partie historique' of d'Orbigny (1846).

47. Colp (1977) does not seem to have found any evidence that Darwin had any ear complaint.

48. Lyell, Charles (1797–1875). Uniformitarian geologist. Professor of Geology, King's College, London, 1831–3. President of the Geological Society, 1834–6 and 1849–50. Scientific mentor and friend of Darwin. FRS 1826. Lyell was in Scotland from late August until mid-November 1838 (Wilson, 1972).

49. Possibly Desnoyers (1831–2), although Lyell already knew of this paper (*Notebooks*: 405n35–1).

50. Owen, Richard (1804–92). Comparative anatomist. Assistant conservator at the Hunterian Museum, Royal College of Surgeons, 1827; Hunterian Professor, 1836–56. Superintendent of the Natural History Department of the British Museum, 1856–84. Described the *Beagle* fossil mammal specimens (Owen, 1838–40). FRS 1834.

51. Caoutchouc, or India-rubber, could be used to seal a bottle.

52. An almost identical reference occurs on D40 and the 'Suites' are also referred to on D179 and on the inside back cover of C (*Notebooks*: $327n_{IBC}$–4). The D40 note was made between the 19th and 22nd of August 1838.

53. Presumably a reference to subscribers to the *Zoology* (Freeman, 1977; *Correspondence* 2).

54. Mr Stewart of Stewart and Murray, printers of the *Zoology*.

55. See note 37.

56. C. M. Curtis, artist for the *Zoology* mammalia volume (Waterhouse, 1838–9), no.2 of which appeared in September 1838.

57. Smith, Andrew (1797–1872). Army surgeon stationed in South Africa, 1821–37. Principal Medical Officer at Fort Pitt, Chatham, 1837; Deputy Inspector-General, 1845. Director-General, Army Medical Department, 1853–8. FRS 1857. Darwin collected sharks' teeth at Navedad in 1834 (see *GSA*), but I can trace no connection between Andrew Smith and South America or sharks' teeth.

58. Mitchell, Thomas Livingstone (1792–1855). Surveyor-General, New South Wales, 1825–55.

59. See C159,189 and D180 on the subject of breeding between native and european dogs.

60. See *VI*: 135 for Mitchell's information on Australian river valleys, published in Mitchell (1838). Darwin records a communication with Mitchell, probably datable to April 1838, on the same subject (see *Notebooks*: 113n92–1).

61. Probably a reference to fossils from Tasmania, judging from the proximity to the following reference (note 62). See Banks (1971) and DAR 40, ff. 45–9.

62. Brown, Robert (1773–1858). Botanist. Librarian to Joseph Banks, 1810–58. Keeper of the Botanical collections, British Museum, 1827–58. FRS 1811. Mabberley (1985).

63. The text on pp.26–7 is drawn over heavily with doodles and sketches of plants. These may be fossil plants from Tasmania given to Robert Brown for description. See fig. 1, and *VI*: 140.

64. 'Major Mitchell is not aware that Australian dogs ever hunt in company–' C213. Entry made in the early summer of 1838.

65. May refer to the woodcuts of volcanic bombs in *VI*: 36, 38.

66. Lonsdale, William (1794–1871). Geologist. Served the Geological Society from 1829 to 1842, first as curator and librarian, and after 1838 as assistant secretary and librarian. Lonsdale was a frequent source of information for Darwin.

67. This question may be directed at Major Mitchell. See note 60.

68. Henrietta Street is near the centre of Bath.

69. 'There is a breed of tailless cats, near Bath. Lonsdale' C175. William Lonsdale (see note 66) provided Darwin with other examples of varieties of domesticated animals (*Notebooks*: 293–4).

70. Henslow, John Stevens (1796–1861). Clergyman, botanist, and mineralogist, Cambridge University, 1822–7; Professor of Botany, 1825–61. Darwin's teacher and friend. The background to Henslow's involvement with plants collected by Darwin is given in Porter (1985).

71. See note 42.

72. The last two lines are written horizontally as was the previous page of text, judging from words on the stub of 34e. The other lines on p.35 were written vertically in the remaining blank space.

73. See note 50. The reference has not been traced, although there was correspondence on 'animal magnetism' in *The Lancet* at this time (e.g. issue of September 22, p. 34).

74. Hall (1815) is also referred to in A36. See also note 123.

75. 'Miss Martineau (How to Observe p. 213) says charity is found everywhere (is it not present with all associated animals?) I doubted it in Fuegians, till I remembered Bynoes story of the women.–' M142. This entry was made between 13 and 15 September 1838. Note that the name in the St Helena Model notebook is clearly Byron. The reference is to Martineau (1838). See also *Correspondence* 1: 520.

76. Youatt (1834).

77. See note 40. 'Wowett on Cattle– (Waterhouse has it)' C_{IBC}.

78. Fox, William Darwin (1805–80). Darwin's second cousin. A close friend at Cambridge who shared Darwin's enthusiasm for entomology.

79. 'Experimentise on land shells in salt water & lizards do.–' B248.

80. Hunter (1837), listed on C270. See note 50.

81. Hybrid pintail and common ducks are referred to on D25,26,33,89,IBC. See also *Natural Selection*: 433n1, and *Variation* 2: 45.

82. Crossing between black grouse and ptarmigan is referred to on D72, dated 8 September 1838 and on D105–6, datable to 13 September 1838. The subject is dealt with in some detail in *Natural Selection*: 434–6, and Darwin's interest in it seems likely to have originated during his fieldwork at Glen Roy in late June 1838. See *Notebooks*: 345n43–1.

83. Grouse-pheasant hybrids are mentioned on B189,D33,105–6 and E106. See note 82.

84. The capercailzie is mentioned on D73 and 105.

85. See note 82.

86. Probably a reference to *Anthus correnderr* Viellot, mentioned in Gould (1839: 85) as having 'probably a further range southward than any other land-bird in the southern hemisphere.'

87. Yarrell, William (1784–1856). Zoologist. Engaged in business as newspaper agent and bookseller in London. Wrote standard works on British birds and fishes.

88. Possibly Hunter (1786) or (1792), listed on C267.

89. Moore (1765). An almost identical entry occurs on D100. See *Notebooks*: 362n100–1. This cross-reference almost certainly dates to 13 September 1838.

90. This is discussed on D100–1. See *Notebooks:* 362n100–2, and note 89.

91. 'as in pidgeons no new races.–' D104.

92. I agree with the reading of this page given in *Notebooks*: 362n100–2, although the phrase may be 'produce feathers and make bones'. Very similar wording occurs on D112.

93. 'Yarrell told me of a cat & a dog, born without front legs–' D108. 'if armless cat can propogate' D112. These pages are datable to between 14 and 16 September 1838.

94. Darwin started househunting on or about 25 November 1838 (See *Correspondence* 2: 120).

95. Freeman (1982) gives an excellent account of the events leading up to the establishment of the newlywed Darwin household at 12 Upper Gower Street ('Macaw Cottage') in January 1839.

96. This may be Charles Stokes (1783–1853). See Wilson (1972, chapter 10).

97. A prospective house in Tavistock Square is mentioned in a letter from Darwin to Emma Wedgwood dated 27 November 1838 (*Correspondence* 2: 129).

98. Thomas Cubitt (1788–1855) is mentioned as the developer of Tavistock Square in Freeman (1982).

99. '2/6' is written in the top left hand corner. It is presumably the price of the notebook (two shillings and six pence).

100. This reference of 1839 is the latest date in the notebook. The reference is to De Berthou (1839). The only other reference to the 1839 volume of the *Journal of the Royal Geographical Society of London* in Darwin's handwriting of which I am aware is the annotation on the letter from J. G. Malcolmson of 7 October 1839 (*Correspondence* 2: 225).

101. Miller, William Hallowes (1801–80). Mineralogist and crystallographer. Professor of Mineralogy, Cambridge University, 1832–80. FRS 1838.

102. Geological specimen 3378, from Tahiti. There is a note in Darwin's specimen catalogue (on deposit at CUL) to 'V. app[*endix*] p. 19', which is a reference to DAR 39.1,f.88. The specimen is mentioned in a note from J. S. Henslow dated 5 November 1837–March 1838 (*Correspondence* 2: 55n2), in Darwin's letter to Henslow of 26 March 1838 (*Correspondence* 2: 79n4), and in Darwin's letter to W. H. Miller of 16 October–27 November 1842 (*Correspondence* 2: 339n2).

103. Presumably Hoff (1822–24).

104. See note 66. One explanation of this entry is that Darwin was entertaining the possibility of William Lonsdale describing at least some of his invertebrate fossils from South America. In the event Lonsdale described Darwin's fossils from Tasmania (Lonsdale 1844) while George Brettingham Sowerby (1788–1854) and Edward Forbes (1815–54) described Darwin's Cenozoic and Mesozoic fossils respectively (Sowerby 1846, Forbes 1846). Darwin enquired concerning Sowerby's credentials for the task in a letter to J. S. Henslow of October 1836 (*Correspondence* 1: 512n4). Sowerby also described Darwin's shells from the Cape Verdes and from St Helena and Tasmania (Sowerby 1844).

105. Possibly a reference to Lyell (1840). Darwin was reading this work in manuscript in September 1838 (see *Correspondence* 2: 107n8).

106. Lyell (1837,2: 175) 'According to Von Buch, the American volcanic rocks contain generally less albite instead of common felspar as a principal ingredient (Poggendorf's Annalen, 1836, p. 190).'

107. Earle, Augustus (1793–1838). Artist and traveller. Artist in the *Beagle*, 1831–2. Hackforth-Jones (1980).

108. Augustus Earle spent nine months on Tristan da Cunha in 1824 (see note 107). Darwin may have been interested in the action of waves on the island (see note 110).

109. Whewell, William (1794–1866). Mathematician and historian and philosopher of science. Tutor at Trinity College, Cambridge, 1823–38; Master 1841–66. Professor of Mineralogy, Cambridge University, 1828–32. FRS 1820.

110. In a letter to Robert Mallet (1810–81) of 26 August 1846 Darwin says he consulted William Whewell (see note 109) on the subject of waves while preparing *JR*. See *Correspondence* 3: 335. In A59 the subject of breaking waves is mentioned with respect to Tristan da Cunha (see note 108).

111. See note 62.

112. See note 65.

113. There is a general connection between these entries and those on B187 and C238–9.

114. The wild dogs of King George's Sound are discussed by Nind (1832: 29).

115. See Ehrenberg (1837), mentioned on A93 (*Notebooks*: 114n93–1).

116. See notes 140 and 160.

117. Parish, Woodbine (1796–1882). Diplomat. Chargé d'affaires in Buenos Aires, 1825–32. FRS 1824.

118. Possibly a reference to the 'single detached tooth' of a *Megatherium*, mentioned as having been in Parish's collection by Owen (1840: 102).

119. 'Thus the Phalangista vulpina inhabits both Sumatra and New Holland' Lyell (1837, 3: 30). Lyell took his reference from Temminck (1827: 16, 19). Waterhouse told Darwin that he did not believe Temminck's statement to be true, in a letter sent to 12 Upper Gower Street (and therefore dating from the last few days of 1838 at the earliest; see *Correspondence* 2: 154). There is a very similar entry in B249e (*Notebooks*: 232–3).

120. Baillière, Hippolyte (d.1867). Bookseller and publisher in London who specialised in French medical and scientific texts.

121. Roget (1834).

122. Müller (1838–42).

123. Hall (1815: 157). This entry cross-refers to p. 36 (see note 74). It is not clear why Darwin has added a reference to the eighth volume of the *Transactions of the Royal Society of Edinburgh*.

124. See King (1828: 423–6).

125. See note 57. The sandstone, which is 2000 feet thick, is described in *VI*: 150–152.

126. See note 70. A mistake for Cocos do mer, mentioned on E164 in relation to discussions with Henslow on 27 May 1839.

127. 'Are the hybrids of those species. which cross & are fertile heterogenous' D_{IBC}. See *Notebooks*: 345n43–1.

128. See note 56.

129. These two entries relate to information given by Smith on the geology of South Africa (see notes 125 and 131).

130. See note 66.

131. This is presumably Smith's reply to Darwin's enquiry at the top of the page.

132. Darwin found *Mastodon* teeth at Gorodona (*GSA*: 87–8; Owen, 1840: 108). See notes 137–8.

133. Sonnerat (1782).

134. See note 37.

135. *Cheroptamus* Cuvier is an Eocene mammal related to pigs (Buckland, 1836 **1**: 80).

136. Egerton, Philip de Malpas Grey (1806–81). Of Oulton Park, Cheshire. Tory MP for South Cheshire, 1835–68. FRS 1831. Egerton was a vertebrate palaeontologist, specializing in fossil fish and footprints.

137. Kaup (1832–5).

138. *Mastodon augustidens* Cuvier is referred to on C46 and E32, the latter reference dated 26 October 1838. See note 132.

139. Hall (1812).

140. Hall (1812). An almost verbatim reference to the same observation occurs on A111, datable to before 11 August 1838. This may cross-refer to the subject touched on in notes 116 and 160.

141. This is a list of the plates thought necessary to illustrate the fossil mammalia of the *Beagle* (Owen, 1838–40). The following are the most probable identifications of the plates listed:

'Edentate Head'	*Glossotherium* in Owen (1839: pl. 16)
'Mastodont'	not illustrated
'Tessalated covering'	*Hoplophorus* Owen (1840: pl. 32, figs. 4–5)
'Scelidotherium'	*Scelidotherium* Owen (1839–40: pls. 20–8)
'Lower jaw'	*Megalonyx* in Owen (1840: pl. 29)
'Megatherium'	*Megatherium* Owen (1840: pl. 30)

142. Not identified.

143. Probably refers to a supposed fossil rat listed by Clift (1831), mentioned on C131 (see *Notebooks*: 278n131–1). See note 144.

144. See note 50. Possibly Darwin was seeking Owen's opinion as to whether the rat (see note 143) was correctly identified.

145. Darwin seems to be asking if he should donate a copy of Waterhouse (1838–9) to the Institute de France.

146. See notes 48 and 156. Lyell gave Darwin a letter written to him in March 1838 which reported volcanic dust falling on a ship at sea (*Correspondence* 2: 77–8).

147. A very similar passage occurs on D65, dated 7 September 1838. See also note 152.

148. See note 42. There are several entries concerning wild dogs of the world in the *Notebooks* (e.g. D7–8).

149. 'Breeding in & in Infertility & loss of passion ?? in Male?' occurs in draft 'Questions for Mr Wynne', datable to February–July 1838 (*Correspondence* 2: 71).

150. Closely related discussion occurs on D163, dated 25 September 1838.

151. '(. . & not effect of breeding in & in like our pidgeons)' D88.

152. See note 147.

153. See notes 39 and 151.

154. See note 48.

155. Prichard (1836).

156. See note 146.

157. See note 94.

158. See note 48.

159. Carlyle, Thomas (1795–1881). Essayist and historian. Darwin met Carlyle for the first time in November 1838 (*Correspondence* 2:128).

160. See notes 116 and 140.

161. See note 48. Lyell mentioned Salisbury Craigs in his letter to Darwin dated 6 and 8 September 1838 (*Correspondence* 2:99).

162. Maclaren, Charles (1782–1866). Established *The Scotsman*, 1817; editor, 1820–45. Wrote on geological subjects. Presumably Darwin knew of Maclaren (1839).

BIBLIOGRAPHY

Short Titles of Darwin Works and Editions

Correspondence
The Correspondence of Charles Darwin. **Vol. 1.** Eds. Frederick Burkhardt, Sydney Smith; David

Kohn, William Montgomery and Stephen V. Pocock. Cambridge 1985; **Vol. 2**: Eds. Frederick Burkhardt, Sydney Smith; Janet Browne, David Kohn, William Montgomery, Stephen V. Pocock, Charlotte Bowman, Anne Secord. Cambridge 1986. **Vol. 3.** *idem* 1987.

GSA

Geological observations on South America. Being the third part of the geology of the voyage of the 'Beagle', under the command of Capt. FitzRoy, R.N. during the years 1832 to 1836. London 1846.

JR

Journal of researches into the geology and natural history of the various countries visited by H.M.S. 'Beagle', under the command of Captain FitzRoy, R.N. from 1832 to 1836. London 1839.

Natural Selection

Charles Darwin's Natural Selection, being the second part of his big species book written from 1856 to 1858. Ed. Robert C. Stauffer. Cambridge 1975.

Notebooks

Charles Darwin's Notebooks, 1836–1844. Eds Paul H. Barrett, Peter J. Gautrey, Sandra Herbert, David Kohn & Sydney Smith. London and Cambridge 1987.

Variation

The variation of animals and plants under domestication. 2 vols. London 1868.

VI

Geological observations on the volcanic islands, visited during the voyage of H.M.S. 'Beagle', together with some brief notices on the geology of Australia and the Cape of Good Hope. Being the second part of the geology of the voyage of the 'Beagle', under the command of Capt. FitzRoy, R.N. during the years 1832 to 1836. London 1844.

Zoology

The zoology of the voyage of H.M.S. 'Beagle' under the command of Captain FitzRoy, R.N., during the years 1832 to 1836. Published with the approval of the Lords Commissioners of Her Majesty's Treasury. Ed. Charles Darwin. London 1839–43.

REFERENCES

Banks, M. R. 1971. A Darwin manuscript on Hobart Town. *Papers and Proceedings of the Royal Society of Tasmania* **105**: 5–19.

Barlow, N. 1933 (Ed.). *Charles Darwin's diary of the voyage of H.M.S. Beagle.* Cambridge.

Barlow, N. 1945. *Charles Darwin and the voyage of the 'Beagle'.* London.

Buckland, W. 1836. *Geology and mineralogy considered with reference to natural theology.* 2 vols. London.

Clift, W. 1831. Report by Mr Clift, of the College of Surgeons, London, in regard to the fossil bones found in the caves and bone-breccias of New Holland. *Edinburgh New Philosophical Journal* **10**: 394–5.

Colp, R. 1977. *To be an invalid: the illness of Charles Darwin.* 285pp. Chicago.

Cross, T. 1980. *St Helena, including Ascension Island and Tristan da Cunha.* Newton Abbott & London.

De Berthou, J. 1939. Extract from a notice on the site of ancient Tyre. *Journal of the Royal Geographical Society* **9**: 286–94.

Desnoyers, J. P. F. S. 1830–2. Sur les ossements humains des cavernes. *Bulletin de la Societé Géologique de France* **2**: 126–33.

Ehrenberg, C. G. 1837. Remarks on the real occurrence of fossil infusoria, and their extensive diffusion. *Scientific Memoirs* **1**: 400–7.

Forbes, E. 1846. Descriptions of Secondary fossil shells from South America. In *Geological observations on South America* ... (see *GSA*): 265–8.

Freeman, R. B. 1977. *The works of Charles Darwin. An annotated bibliographical handlist.* 2nd ed. 235pp. Folkestone.

Freeman, R. B. 1982. *Darwin and Gower Street.* London.

Gould, J. 1838–41. *The zoology of the voyage of H.M.S. 'Beagle' under the command of Captain FitzRoy, R.N., during the years 1832 to 1836 . . . Part 3: Birds.* London.

Hackforth-Jones, J. 1980. *Augustus Earle, Travel Artist.* London.

Hall, J. 1812. Account of a series of experiments, shewing the effects of compression in modifying the action of heat. *Transactions of the Royal Society of Edinburgh* **6**: 71–186.

Hall, J. 1815. On the revolutions of the Earth's surface. *Transactions of the Royal Society of Edinburgh* **7**:139–67 (part 1), 169–211 (part 2).

Herbert, S. 1977. The place of man in the development of Darwin's theory of transmutation. Part II. *Journal of the History of Biology* **10**: 155–227.

Hoff, K. E. A. von 1822–24. *Geschichte der durch Ueberlieferung nachgewiesenen natürlichen Veränderungen der Erdoberfläche.* 3 vols. Gotha.

Hunter, J. 1786. *Observations on certain parts of the animal oeconomy.* London.

Hunter, J. 1792. *Observations on certain parts of the animal oeconomy.* 2nd ed. 273pp. London.

Hunter, J. 1837. *Observations on certain parts of the animal oeconomy . . . with notes by Richard Owen.* 506pp. London.

Kaup, J. J. 1832–5. *Description d'ossements fossiles de mammifères inconnus jusqu'à présent qui se trouvent au Muséum grand ducal de Darmstadt; avec figures lithographiées.* 4 vols. Darmstadt.

King, P. P. 1828. Extracts from a letter addressed by Capt. Philip Parker King, R.N., F.R.S. and L.S., to N.A. Vigors, Esq., on the animals of the Straits of Magellan. *Zoological Journal London* **3**:422–32.

Lonsdale, W. 1844. Description of six species of corals, from the Palaeozoic formation of Van Diemen's Land. In *Geological observations on the volcanic islands . . . (see VI)*: 161–9.

Lyell, C. 1837. *Principles of geology: being an enquiry how far the former changes of the earth's surface are referable to causes now in operation. 5th edition.* 4 vols. London.

Lyell, C. 1840. *Principles of geology: or, the modern changes of the earth and its inhabitants, considered as illustrative of geology.* 6th ed. 3 vols. London.

Mabberley, D. J. 1985 *Jupiter Botanicus. Robert Brown of the British Museum.* 500pp. Braunschweig & London.

Maclaren, C. 1839. *A sketch of the geology of Fife and the Lothians, including detailed descriptions of Arthur's Seat and Pentland Hills.* 235pp. Edinburgh.

Martineau, H. 1838. *How to observe. Morals and Manners.* London.

Mitchell, T. L. 1838. *Three expeditions into the interior of eastern Australia.* 2 vols. London.

Moore, J. 1765. *A treatise on domestic pigeons.* London.

Moore, D. M. and **Scannell, M. J. P.** 1986. Bartholomew Sulivan and early watercolors of the Falkland Islands vegetation in the National Botanic Gardens, Dublin. *Archives of Natural History* **13**: 155–163.

Muller, J. 1838–42. *Elements of physiology.* 2nd ed. 2 vols. London.

Nind, S. 1832. Description of the Natives of King George's Sound (Swan River Colony) and adjoining Country. *Journal of the Royal Geographical Society* **1**: 21–51.

Orbigny, A. C. V. D. d' 1835–47 *Voyage dans l'Amérique Méridionale . . ., exécuté pendant les années 1826 . . . 1833.* 9 vols. Paris & Strasbourg.

Owen, R. 1838–40. *The zoology of the voyage of H.M.S. 'Beagle' under the command of Captain FitzRoy, R.N., during the years 1832 to 1836 . . . Part 1: Fossil Mammalia.* London.

Porter, D. M. 1985. The *Beagle* collector and his collections. In **Kohn, D.** (Ed.) *The Darwinian Heritage*: 973–1019. Princeton.

Prichard, J. C. 1836–47. *Researches into the physical history of mankind.* 2nd ed. 2 vols. London.

Roget, P. M. 1834. *Animal and vegetable physiology considered with reference to natural theology.* 2 vols. London.

Rudwick, M. J. S. 1982. Charles Darwin in London: the integration of public and private science. *Isis* **73**: 186–206.

Seale, R. F. 1834. *The geognosy of the island of St Helena, illustrated in a series of views, plans and sections; accompanied with explanatory remarks and observations.* 25pp. London.

Smith, K. G. V. 1987. Darwin's insects. *Bulletin British Museum (Natural History) Historical Series* **14**: 1–143.

Sonnerat, P. 1782. *Voyage aux Indes Orientales et à la Chine, fait par ordre du Roi, depuis 1774 jusqu'eu 1781.* 2 vols. Paris.

Sowerby, G. B. 1844. Description of fossil shells. In *Geological observations on the volcanic islands* ... (see *VI*): 153–60.

Sowerby, G. B. 1846. Descriptions of Tertiary fossil shells from South America. In *Geological observations on South America* ... (see *GSA*): 294–64.

Temminck, C. J. 1827–41. *Monographies de mammalogie, ou description de quelques genres de mammifères, dont les espèces ont été observées dans les différents musées de l'Europe.* 2 vols. Paris & Leiden.

Waterhouse, G. R. 1838–9. *The zoology of the voyage of H.M.S. 'Beagle' under the command of Captain FitzRoy, R.N., during the years 1832 to 1836 ... Part 2: Mammalia.* London.

Wilson, L. G. 1972. *Charles Lyell: The years to 1841. The revolution in geology.* 553pp. New Haven & London.

Youatt, W. 1834. *Cattle: their breeds. Library of Useful Knowledge.* 600pp. London.