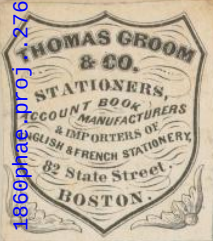


KG
11365
276

M.29

Printing-
1860 to

Sold by T. Groom & Co., Stationers, India Building, 82 State St., Boston.



X B-11365. 276

m 29

1860 Dec 20 Go have plate of Curvature Oct 5
as frontispiece add stars if possible.

Mr Watts 228 Wash St-

NG 11365-276



Engraving - Comet of Donati

1860 April 14 Mr Watts took naked eye views
of Sept. 16th and Sept 17th 1858.

For memoranda of prices de see papers
on file of this date.

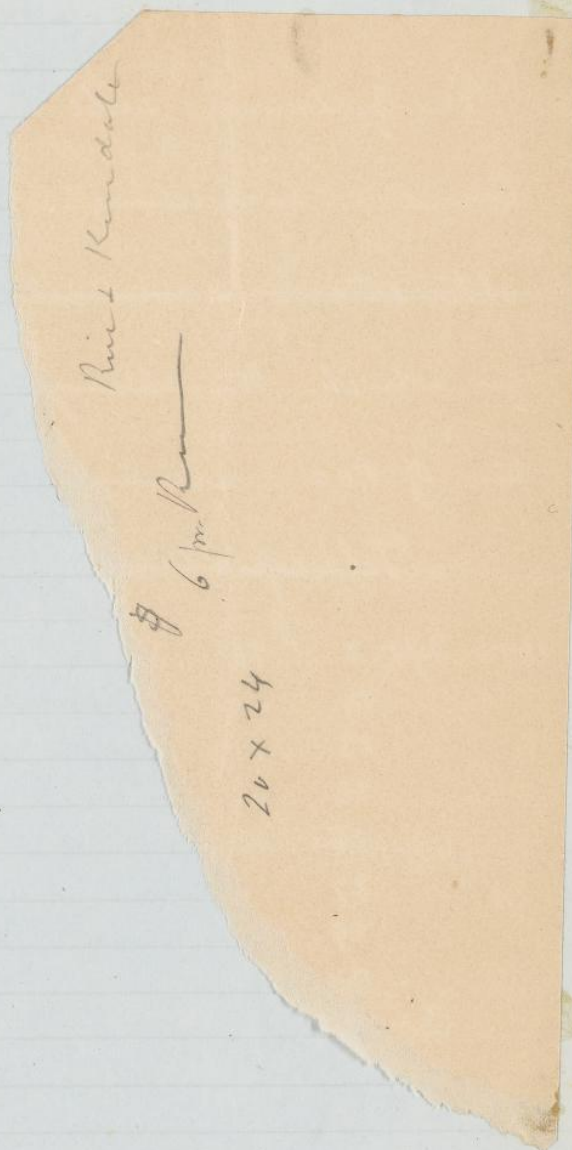
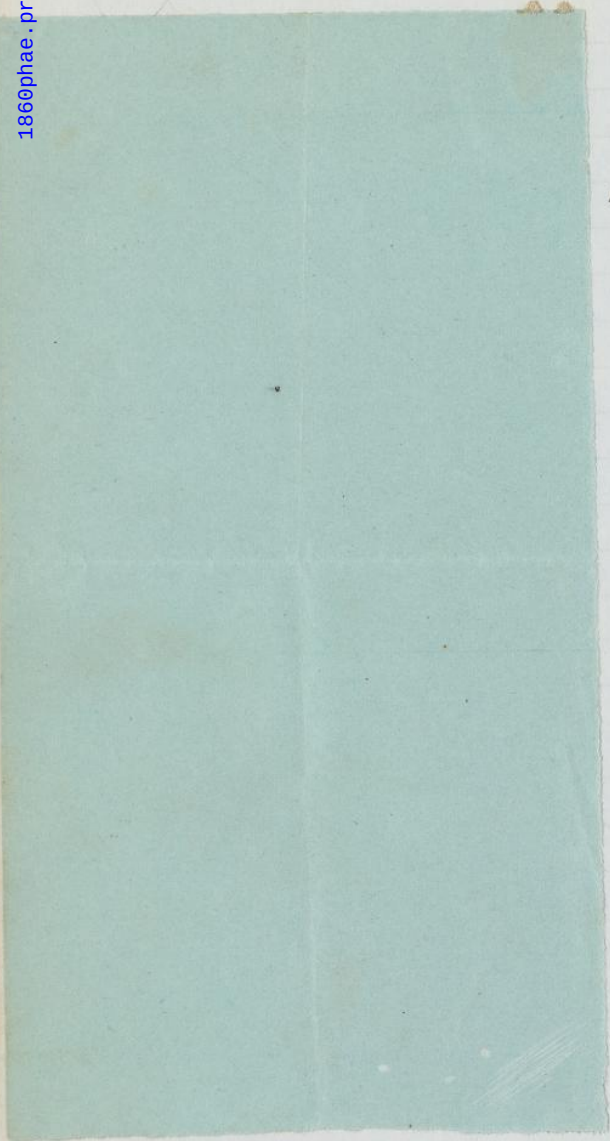
French paper 40 lbs to Ream with cost 75 cts
for 100 impressions
English paper .. with cost 3X 0.75
= 2.25

May 15 Found at Groom's English paper 22 x 28
weight 63 lbs a Ream of 480 sheets 22 x 28 \$45

He says the specimen given by Mr Watts of French
plate paper is excellent. but it is only 19 x 24
barely large enough. 50 lbs to Ream
at 20 cts per lb.

Prices range from 12 to 20 cts per lb.

19 x 24 French
50.50 lbs to Ream
at 20 cts per lb. Also
40 lbs to Ream at 20 cts.



1860 May 17 Mr. Walter took the naked eye view from
 Sept 29th and 30th 1858. To be engraved on sep-
 arate plates

By agreement with Mr Watts April 14

The following will be the prices of engraving plates of Comet - including steel. Lettering & all reasonable alterations & corrections but not paper & striking off for which the charge will be \$3 per 100 copies for an edition of 500 using 20 ct paper - as by sample 2 pages back

Numbering adopted April 1861

Telescopic Views

April 1861

Naked Eye Views

Telescopic Views		Naked Eye Views	
1858 Sept. 8	\$ 50	Sept. 16	\$ 50
20	"	17	"
23	"	24	"
24	"	26	"
25	"	27	"
27	"	28	"
29	Frontispiece to Part 55	29	30
30	"	30	"
Oct 2	"	Oct 1	"
4	"	2	"
5	"	3	"
6	"	4	"
8	"	5	"
9	"	6	"
10	"	7	"
11	"	8	"
15	"	9	"
18	"	10	"
19	"	11	"
20	"	12	"
		15	"
		13	"
		14	"
		15	"
		16	"
		17	"
		18	"
		19	"
		20	"
		21	"
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		26	"
		27	"
		28	"
		29	"
		30	"
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		34	"
		35	"
		36	"
		37	"
		38	"
		39	"
		40	"
		41	"
		42	"
		43	"
		44	"
		45	"
		46	"
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		88	"
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		90	"
		91	"
		92	"
		93	"
		94	"
		95	"
		96	"
		97	"
		98	"
		99	"
		100	"

Estimates for Engraving Comet of Donati

The French paper as by sample will
cost 20 cts per lb. and 0.75 for 100 impressions
For 500 impressions 38 plates 38×3.25 \$123.50
Striking off. \$3 per 100 at highest 38×15.00 570.00
Total French paper & striking off 38 plates 500 copies 693.50

English paper @ 75 cts per lb. 463.12
Striking off 570.00
Total 1033.12

(450 pages) Printing text & binding paper & 1500.
Engraving as on price page 1630
4163

May 21 Prof. Loomis pays \$4.50 per ream for Academy
paper. 8 pages to a sheet

May 21 Wrote to Mr De la Rue for samples as in margin
of paper. vide copy of letter



1860

May 22 Saw Mr Bigelow (Welch & Bigelow)

A 4to Am. Acad. Memoirs size - of 500 pages 500 copies
will take 64 Reams & pages to a sheet.

19/20 only of Ream is good.

The paper used for Am Ac. at \$3.75 per Ream
was not good enough & should be \$4.50 to \$5.00.

If a black ground wood cut occurs in a form
of 8 pages the cost of printing is \$2.00 per token in place of
0.40 for plain work. but a diagram black on white
will cost only as plain work.

70 Reams paper at \$5	Edition of 500	\$350.00
Composition & Printing \$13 per page	500 pages	1500.00
Binding & Extra paper for Covers &c		70.00
Corrections &c		50.00
		1970.00

An Edition of 500 of 500 pages $\frac{2}{3}$ tables vide the Estimates
for Vol. of Annals in Book "Printing of Lane Os"

As this new Vol. will comprise a less proportion of tabular
matter & less than 500 of letter press. The cost of letter press
being only $\frac{2}{3}$ of tabular matter for 450 pages we may
estimate \$1500.00

1861 March 26 Foreign languages cost 20 per cent more for composition

1860 June 2

Mr Watts brought proof of plate naked eye view of Sept. 30th

Took naked eye view of Oct. 2nd & the drawing showing curvature of Oct. 5.

June 4 Recd from Mr. Watts 2nd Proof of full length for Sept 30th It is very satisfactory.

June 27th Recd from Mr Watts Proof of large plate showing curvature Oct. 5. and of Sept 16 & 17 on one plate the latter to be made fainter The first very good

Mr Watts took the naked eye views for Sept 27 & 28 To go on one plate

June 28 Mr W. presented bills for plates as follows:

Copy

Boston June 29 1860

The Observatory of Harvard College

To James W. Watts

Dr

To Engraving Plates of Comet of Donati

June 7 Plate of Sept 30 1858

\$ 30

27 Double Plate Sept 16-17

50

" Plate showing Curvature

30

Preliminary Experiments with small plate, trials &c.

20

130

Paid as by Receipt on file. July 6

By Order on J. I. Bowditch

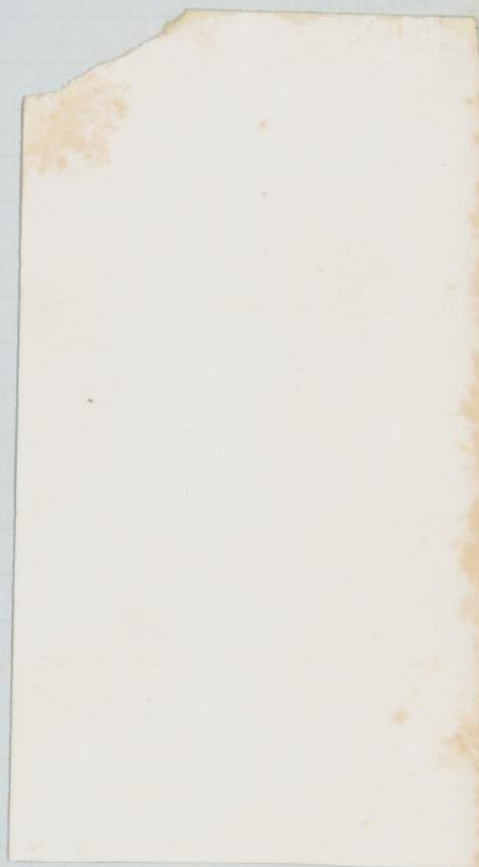
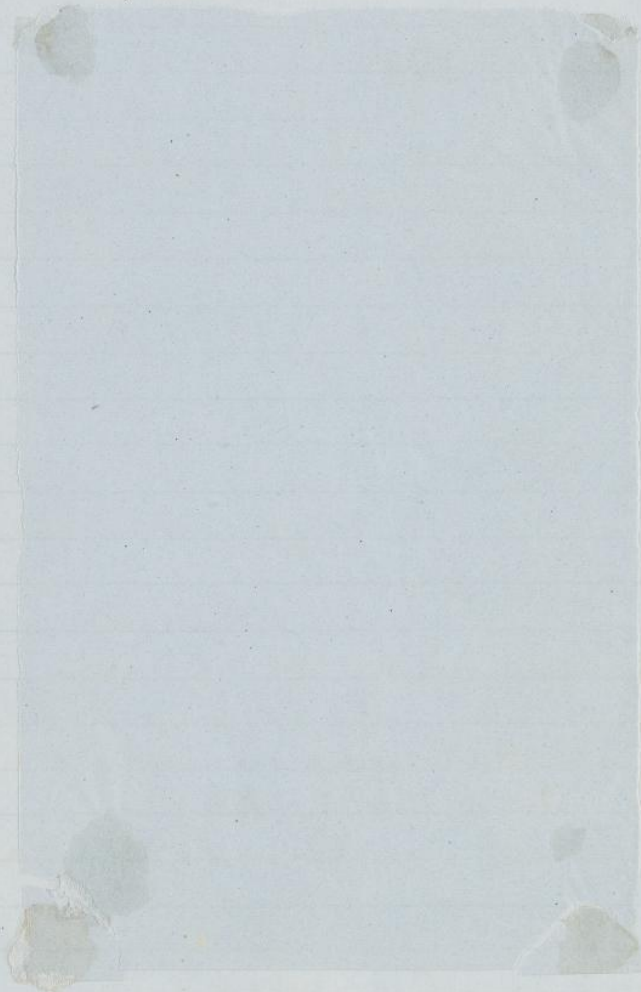
1860 June 29th

Received from
110 Bunhill Row London E.C.

7
Thos De la Rue & Co

Specimen sheet of best
white plate paper $25\frac{3}{8} \times 20\frac{1}{4}$ inches weight 50 lbs per Ream
price $1\frac{1}{2}$ net for lb.

Mr Watts saw the specimen. (a part of which is
here annexed.) & approved of it highly - recom-
mended the 50 lb paper & tint as shown below



1860 July 19 Sent to Thos. DeLaRue order for 12 Reams Plate
Paper tinted is in specimen annexed

In copy of Order on file -

1860 Aug 9 Mr Walter brought proofs of Sept 29 & Oct 2 naked eye

" Took Plates naked eye Sept 24 & 26 to go on our
plate - and Plates Oct 1 and 3 naked eye.

1860 Aug 10 Received of Thos Green & Co. Sample of English paper suitable for manufacturing Size $20 \times 25\frac{1}{2}$ weight 750 lbs per Ream & 64 lbs. That for

50 lbs " will cost \$118 delivered.

Price left for larger quantity.

Specimen annexed is probably 50 lbs per Ream.



1860 Aug 22 Mr Walter brought proof of Engravings for Sept 30th (new plate) very good and for Sept 27 & 28 on one plate to have some slight alterations. The following plates are to be delivered by Mr. Walter bettered & ready for press on payment of bill - viz: - Sept (16 & 17), (27 & 28), (29), (30) (Oct. 2) and (Oct. 5 showing curvature) Mr Walter has re-engraved the plate for Sept. 30th.

1860 Aug. 24 Wrote to Mr Walter in by draft on file proposing arrangement respecting prices of engravings.

An edition of 480 copies of 38+2 plates will take 10 Reams
 of Paper. 50 lbs per Ream @ 1.24 = \$14.50 + duties 20 per cent + freight
 0.75 + incidental expenses 0.85 = \$19.00 per Ream

10 Reams @ \$19.00 = 190.00 — — — — 190.00

Striking off @ \$3 per 100 \$15 X 40 600.00

Engraving 38 Plates as on previous page 1630.00
 2 100.00

2520.00

Printing text and binding 1500.00
 Expenses of distribution &c. 200.00

40 Wood cuts at \$5 200.00

Touching with water color. &c. 100.00

11
Copy of Mr. Watts's Bill rendered Aug. 1860.

Boston August 28th 1860

Observatory of Harvard College To James W. Watts Dr.

To Engraving Views of Comet of Donati on steel

Plates 12 & 11 Sept. 28 & 27 - - Double - - - \$ 50.00

--- --- 29 Single 30.00

--- Oct. 2 --- 30.00

--- Eighteen Proofs \$ 3 Half day at Printers 2.50 5.50

Received Payment \$ 115.50

(Receipt on file)

Cambridge Aug. 28th 1860.

Please pay to the order of James W. Watts One
Hundred and Fifteen Dollars ⁵⁰/₁₀₀ \$ 115.50

On account of bill for engravings for
Annals of Observatory of Harvard College

To J. I. Bowditch Esq.

(Signed) | G. P. Bond.

Mem. To have secondary tint added to engraving for showing curvature Oct. 5th (Gave directions to Mr. Watts)

1860 Aug. 31st Mr. Watts took naked eye views of Oct 4. 5. 6. 7 and Oct. 13th and 15th

Copy of Invoice rec'd from Dr. La Rue & Co Sept. 13th/1860

Sent to R^y Bond

110 Bunhill Row London

The Observatory of Harvard College Aug 29 1860

Bot of Thos Dr. La Rue & Co.

Shipped for Str. Via Liverpool for Boston
Marked & numbered as in margin

Observatory of

Harvard College

No of Case

\$ 1/2 Two Cases

Quantity

Price

1

6 Reel

Best tinted Plate paper to pattern

62/6 18 15

24 x 20 in 50 lbs

2

6 "

" "

" 18 15

37 10

Cr by Drawback

3 19 10

33 10 2

(Copy of Letter to Hon Amos Lawrence)

13

Cambridge, Mass. Sept. 26th '60
 Hon. Amos A. Lawrence.
 Treasurer of Harvard College.
 Dear Sir:

By the steamer of the
 21st inst. from Liverpool, two cases marked: -
 Observatory of Harvard College # 1

2
 were received, and are now lying at the Custom House
 Boston. They contain "Plate Paper" imported
 solely for the use of the Institution, and are, as I suppose,
 entitled to pass free. Will you have the goodness to
 give to Messrs. Bond & Son, to whom the goods are
 consigned, such certificate of their contents as the
 Custom House may require?

Respectfully Yours.
 (Signed) G. P. Bond.

Impress Plates delivered

1861 Sept 20	Plate 38 39	509
	40 41	506
	42 43	516
	44 45 & 46	505

Impress of Plate 29-30 not delivered -

1860 Oct. 5th

Mr Watts brought finished proofs of Naked Eye views
for Oct. 7th 3rd Sept. 24-26 Double plate

Copy of Mr. Watts Bill.

Boston, Oct. 5th 1860

The Observatory of Harvard College to

James W. Watts Dr.

To Engraving Views of "Comet of Sonati" on steel
Plate 17 Single, Oct. 1st " \$ 30.00

" 20 " " 3rd " 30.00

" 7+8 Double Sept. 24 + 26 " 50.00

110.00

Received Payment

(signed) James W. Watts.

The above bill was paid by an order of which the following is a copy.

Cambridge Oct. 5th 1860

Please pay to the order of James W. Watts, one
hundred and ten dollars \$110.00

On account of bill for Engravings for
Annals of Observatory of Harvard College

To J. I. Bowditch, Esq.

(signed) G. P. Bond.

1860 Oct 15

Sent letter to Sec. of Treasury - on subject of duties on paper - 12 Reams per Envelope Sept. 21st

Oct. 16th Mr Watts brought proof of engravings for Oct 4 & 5 1858 - naked eye. He also showed specimen of "columnar" structure of extremity of tail Oct 15. His assistant has been taken sick

Oct 17 Sent protest against sleeping duties on paper to Collector Port of Boston.

" 19 Mr Watts exhibited proof of naked eye views for Oct 12 & 15 (double plate) some alterations were suggested and on the following day he brought a corrected proof which was perfectly satisfactory.

1860 Oct 24th Mr Watts brought finished proofs of Naked eye views for Oct 4. 5 & 12 & 15 on a double plate.

Copy of Bill

Boston, Oct 24th 1860

The Observatory of Harvard College

To James W. Watts. Dr.

To Engraving Views of "Comet of Sonati" on steel, \$ 30.

Oct. 4th - - - Plate 22 Single - - - 30.

Oct. 5th - - - " 24 " 30.

Oct. 12th & 15th " 37 & 38 Double 50.

Eighteen Proofs - - - - - \$ 2

\$ 112.

Rec^d payment

(signed)

James W. Watts.

The above bill was paid by an order of which the following is a copy.

Cambridge, Oct. 24. 1860.

Please pay to the order of James W. Watts, One Hundred and Twelve Dollars \$ 112.00

On account of Bill for Engravings for Annals of Observatory of Harvard College.

J. J. Bowditch. Esq.

(signed)

G. P. Bond.

Mr Watts took remainder of naked eye views viz. Oct. 8. 9. 10. 11 and 13. The latter had been overlooked in numbering the plates so that Plate for Oct 13 will come after that for Oct 15.

We are going to try laying a white ground for the nucleus. Did not succeed as varnish from lithography prevented paper from taking the ink.

Copy of Letter to Messrs Thos. De La Rue & Co.
enclosing first of exchange 37² 8⁵ on file. Nov. 2nd 1860.

Observatory of Harvard College
Cambridge Mass. Nov. 2nd 1860.

Messrs. Thos. De La Rue & Co.
Gentlemen.

Enclosed please find first Bill of exchange on George Peabody & Co. of London for 37² 8⁵ dated Nov. 1 - 1860 - which amount please credit on our accounts of Aug. 29th for 12 Reams Plate Paper to Harvard College.

The duties we have paid under protest - & the consequent delay has prevented an earlier acknowledgment of its arrival. The quality of the paper appears perfectly satisfactory. The tint is good. A few specs are noticed where the coloring matter has not been perfectly dissolved & this may occasionally injure an impression.

Please accept our thanks for your promptness in filling the order.

Respectfully
Your Obedt. Servant
(Signed) G. P. Bond
Director of Observatory of Harvard College.

Nov 3 Mr Watts sent proofs of experiment of laying on white ground on tinted paper by lithography.

For binding it is considered best to turn in the plate
 $\frac{1}{4}$ inch.

Nov 5th 1860 The Bill of Exchange on prev. page was brought
for us by Wm Bond & Son a price for by the
following order
(Copy)

Cambridge Nov. 5 1860

Please pay to the order of Wm Bond & Son
one Hundred & eighty two $82/100$ Dollars \$ 182.85
On account of Bill of Thos. Dr. de Rue & Co for
Plate paper imported from London for Annals
of Observatory of Harvard College
J. I. Bowditch Esq (Signed) W. P. Bond

1860 Dec 5th Mr Watts took the following Telescopic views

Sept 8 20th 23rd & 29th

1860 Dec 20th Mr Watts took Telescopic View for Sept. 24th

He presented Bill for work done on Plate X 101 Sept 29 Telescopic.

\$40 paid by order copied on next page. Plate not yet finished.

See next page for change in ~~style~~ of arrangement
of engravings of Telescopic views.

Balance on this plate
was paid Jan 14. 1861.

Copy of Order given Dec 20th 1860

Cambridge Dec 20th 1860

Please pay to the order of James W. Watts
Forty Dollars

\$40.00

On account of Bill for Engravings for
Annals of Observatory of Harvard College

To J. J. Woodward Esq.

(Signed) G. P. Bond.

1860 Dec. 20th Mr Watts brought proof of Telescopic views Sept 29th
Plate X III, & it was concluded that the rest of the plates would
give as good an effect if two plates were included on each
as below.

He will engrave the two on one Plate
for \$75^{*} instead of $50 \times 2 = 100$ as in the orig-
inal agreement for separate plates.



The amount thus saved I propose to lay out on
the Comet of June 1860.

* See Dec. 26

Estimates

1860 Dec. 20th

Naked eye Views - for Steel - Engraving - 3 proofs struck off
 & corrections

Sept 16 - 17	\$ 50		
30	30	Preliminary Experiments	\$ 20
Oct 5 (Curvature)	30		
27-28	50		
29	30		
Oct 2	30	Eighteen Proofs	3
1	30	Time at Printers	2 50
3	30	" "	2 00
Sept. 24-26	50		
Oct 4	30		
5	30		
12-15	50		
	440		27 50
	27.50		
Total	<u>467.50</u>	finished to date	12 Steels.

Oct. 6-7-8-9-10-11-13	= 7 x 30 = 210	Estimated	
7 x 3 = 21 Proofs	3	"	
Total	213	" 7 Steels	
	467.50	Finished 12 "	
Total	680 50	Naked Eye Views	
		19 Steels	

Cost of 12 Reams Paper of Orla Rue
 Duties & Expenses

182.85
40 00
 222 85

Net cost < \$19 a Ream

Dundries 2 89
 225.74

Estimates

$$3 \overline{) 28 \times 50} \\ 9 \frac{1}{3} \quad 16 \frac{2}{3}$$

$$16 \frac{2}{3}$$

$$\begin{array}{r} 10 \\ - 1 \\ \hline 9 \\ 9 \frac{1}{2} \\ 9 \frac{1}{2} \end{array}$$

9 67

$$\begin{array}{r} 27.5 \\ 11.0 \\ \hline 0.6 \\ \hline 29.1 \end{array}$$

$$\begin{array}{r} 7.25 \\ 475 \\ \hline 19.00 \\ 27.50 \\ \hline 8.50 \end{array}$$

$$\begin{array}{r} 9.75 \\ 3 \\ \hline 29.25 \end{array}$$

$$\begin{array}{r} 10.8 \\ 6 \\ \hline 0 \end{array}$$

8

$$\begin{array}{r} 1.00 \\ 9.25 \\ \hline 0.6 \end{array}$$

27.5

Spec 0.25 stick



$$\begin{array}{r} 9.80 \\ 9.80 \end{array}$$

$$\begin{array}{r} 0.25 \\ 0.75 \\ 9.25 \\ 9.75 \\ 9.75 \\ \hline 29.75 \end{array}$$

The great disintegrating

or nearly so of On the earth

The absence of any

from being absent or perhaps entirely absent

Water & of an atmosphere - the disintegration of rock its surface

$$\sin x = 2 \sin \frac{1}{2} x \cos \frac{1}{2} x$$

$$\sin \frac{1}{2} x = \frac{1}{2} \frac{\sin x}{\cos \frac{1}{2} x}$$

$$\sin^2 \frac{1}{2} x = \frac{1}{4} \frac{\sin^2 x}{\cos^2 \frac{1}{2} x}$$

$$\begin{array}{r} 4.068 \\ 0.602 \\ \hline 468 \end{array}$$

Cambridge Feb. 15th 1861.

Please pay to the order of James W. Watts
One Hundred Dollars

+	p 6	Jan 29	130	
+	11	Aug 28	115.50	18 Proofs
+	14	Oct 5	110.00	
+	16	" 24	112.00	18 Proofs
	18	Nov 5	182.85	~~28~~
+	19	Dec 20	40.00	
+	22	Jan 14	100.00	
+	23	" 25	52.50	
+	24	" 31	42.89	Paper 182.85
+	24	Feb 4	67.50	<u>42.89</u>
+	25	" 15	105.40	Paper 225.74
			<u>1058.64</u>	Sept 29 <u>50.00</u>
				3 Proofs <u>0.30</u>
			<u>276.04</u>	= 276.04

Total cost Feb. vms finished

~~Paper Duties etc~~

10 sticks as on p. 21

2 30 Proofs

Paper etc

500 copies striking off @ 3

682.60

~~225.74~~

808.00

1490.60

225.74

435.00

2151.34

Plates

8.10-23.20

100.00

376.04

Estimate

1860 Dec 20²

Mr Watts Dec 26

Sept 8 - 20	\$ 75 + 5	
" 23 - 24	75 5	10 Steels
" 25 - 27	75 5	10 x 3 = 30 proofs = \$6
" 29	50 0	
" 30 Oct. 2	75 5	
Oct. 4 - 5	75 5	
" 6 - 8	75 5	
" 9 - 10	75 5	
" 11 - 15	75 5	
" 18 - 19 - 20	100 + 12	On one plate Sep. 22.
	750 + 52	
30 Proofs	6	
Total	756 + 52	10 Steels Telescopic Viewer
	680.50	19 " Naked Eye
Add	1436.50	29 " in all
	52	
	1488.50	
Total Expense of Engraving	29 Steels as above	\$ 1436.50 + 52

500 Copies Striking off @ 3 per 100 copies
 \$15 x 29 Steels 435.00

500 x 29 Steels = 14500 quarter sheets of paper
 $\frac{1}{4}(14500) = 3625$ sheets = 7 Reams and 265 sheets
 Or, Allowing 215 Sheets waste & 8 Reams
 8 x \$19 152.00

Total Expense of Engraving Paper & Striking off 29 Steels 2023.50 + 52
 Or at the rate of \$71¹/₂ for each Steel.

Estimate as on p 10
 Balance at disposal 2520.00
 Final Balance 496.50 - 52
 444.50

As Mr Watts by agreement was to have \$1630 (Sep 10)
 for 38 Plates he is to have ~~the~~ (1630 - 1436.50) = say \$200⁵² of
 additional work given him to make up the original
 amount or say 2¹/₂ more Steels.

1860 Dec. 26 Mr. Watts will engrave plates as on the preceding page at \$80 for double plates and \$112 for the tripple plate. To include all items as by previous agreement.

1861 Jan 14 Mr Watts brought proof of Telescopic view Sept. 29th finished - Also first proofs of Naked eye views Oct 6-7-8-9- Corrected Oct. 8 & gave it back - rest to be corrected today or tomorrow.

Paid Mr. Watts on account for work executed on above

For finishing Tel. view Sept. 29th

\$ 10.00

For work on plates Naked eye view Oct 6-7-8-9

90.00

100.00

By order of J. J. Bowditch Esq.

Coppy

Please pay to the order of James W. Watts

One Hundred Dollars

100.00

On account of Bills for engravings for Annals of Observatory of Harvard College

Signed

G. P. Bond

J. J. Bowditch Esq.

Cambridge Jan 14 1860-

Telescopie Views of Oct 18-19 and 20 to be disposed on one sheet as

Comet of Donati 1858
 October 18th 7th M.S.T. Observatory of Harvard College
 Plate XL

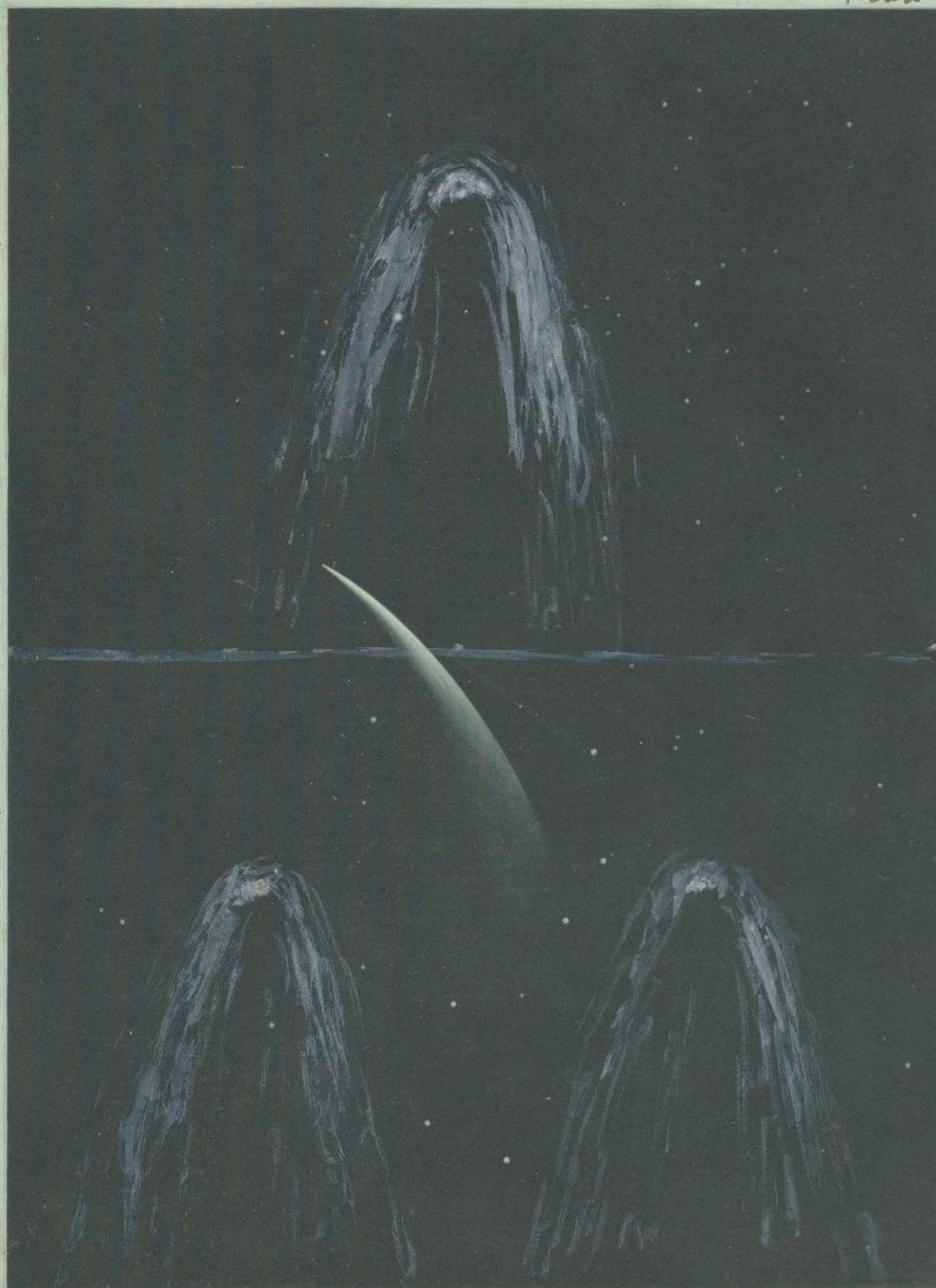


Plate XLII Comet of Donati 1858

Plate XLIII.

October 19th and 20th 7th M.S.T. Observatory of Harvard

1861 Mr Watts showed last proof of Naked eye view
for ~~for~~ Oct 8th

1861 Jan 25th Mr. Watts showed ^{second} last proofs of Oct 6-7-9
and 10th a few corrections to be added - He also
showed proof of Oct 11 -
all of naked eye views -

Paid following bills of Mr Watts by order on
J. I. Bowditch as below

Boston Jan 25 1861

The Observatory of Harvard College
To James W Watts Dr

To Engraving of Comet of Donati.
Plates (Oct) 7th 8-9-10th
Finishing 7th 8th 9 22.50
Engraving (Oct) 10th 30.00

Received Payment
(Signed) James W. Watts.

Copy -
Please pay to the order of James W Watts
Fifty two Dollars $\frac{50}{100}$ \$52.50
On account of Bills for engravings
for Annals of Observatory of Harvard College
To J. I. Bowditch Esq (Signed) E. P. Baird

1861 Jan. 31st

Paid Bill of Wm Bond & Son as by Receipt
on file. Charges for Duties &c on Plate Paper imported
from London of Dr De Rue 42-89
By following Order.

(Copy)

Cambridge Jan 31 1861

Please pay to the order of Wm Bond & Son
Forty Two Dollars 89/100 \$ 42.89

On account of Duties & Expenses upon
paper imported for "Annals of Observatory"

J. J. Bowditch Esq

Signed

G. P. Bond

1861 Feb. 4th Mr Watts brought last proofs of engravings
staked up views Oct. 6 11th and 13th Completing the whole
number.

Paid following bill of Mr Watts

To engraving Plate Oct 11	30 00
13	30 00
Finishing 6	7 50
	67 50

Paid by Order as follows:-

over of Cambridge Feb 4 1861
Please pay to James W. Watts

Sixty Seven 50/100 Dollars 67 50

On account of Bills for engraving
for Annals of Observatory of Harvard College.

J. J. Bowditch

(Signed)

G. P. Bond

Mr Watts estimates \$20 for engraving, paper & striking
 26 500 copies - On copper. Outlines of head each plate.

1861 Feb 15th Mr Watts showed first proof of Tel. views
 for Sept. 8th, 20th, 23rd and 24th. Paid on account as follows

Work on Plates Sept. 8 th , 20 th , 23 rd and 24 th Telescopic	\$100.00
Twenty four Proofs Plate Oct 6-7-8-9-10-11-13.	
Naked eye and Sept. 29 th Telescopic.	2.40
Experiments on Stone	3.00
	<u>105.40</u>

Receipt on File

Paid by order as follows
 (Copy)

Cambridge Feb 15 1861

Please pay to the order of James W. Watts
 One Hundred & Five Dollars 40/100 105.40

On account of Bills for engravings for Annals
 of Obs. of Harvard College

J. S. Bowditch Esq.

Signed G. P. Bond

Mr Watts showed specimen of paper as in margin
 for engraving from copperplate transferred
 to stone.

Paper & striking off \$1 pr 100 together

see top of page

Gave Anago Vol II to Mr Watts for copy

Estimates

By numbers on p.p. 5, 10, 20, 21, 82, 83

1861

Feb. 15 To date inclusive by accounts paid as on p.p. 82-83. \$ 1058.64

Divided as follows: -

De la Rue & Co for paper
Freight, Duties etc

182.85

42.89

225.74

Engraving Tel. views Sept 29 50.00
3 Proofs 0.30

Engraving Tel. views Sept. 8-20 }
Sept 23-24 in part } 100.00

150.30 = 150.30

Naked Eye

376 04 = 376.04
= 682.60

Total cost of 19 Steels Tel. views
including all extra expenses

Estimate from p. 21 for 10 Steels Tel. views

Including Proofs

808.00

Paper as above

225.74

Striking off 500 copies 29 steels

435.00

2151.34

Printing, Binding & distribution as on p. 10

2000.00

March 18 Estimate Steel plate Comet June²⁷ 1860 Engr. 45 00
Striking off do 500 15 00

Estimates from p. 33 viz

Copper plate small Chart A with

Striking off 12 included -- 50 00

Copper plate - Catenary Parabola etc 39 75

" 16 outlines 45 00

Lithographs p 32. Chart C 115 00

Steel plate as on p. 35 9 views 90 00

" " of 20 " 100 ?

" Striking off say 15 00

For Plates Estimated to March 18 Total 414 75

To the foregoing must be added an estimate of \$50 for additional
expense of striking of 'curvature' Oct 5th and Telescope Sept 29th
as on p. 38.

8

1711

1969 Feb 20

For the outlines of head of Comet two copper plates as described on p.p. 114-115a & 115b. The copy for engraver for one plate will be found on p.p. 115b, 115c and 115d - consisting of 15 normal curves & the final normal reduced to same scale.

The copy for other plate is on p.p. 115e & 115f. The four vultures are to be superimposed & distinguished by dotting or different colors. In lower part of plate is to be the normal combining all together and a parabola & catenary. drawn about common origin & axis as on p 115g Cons. Don.

Chart A to be reduced $\frac{1}{2}$ on copper

Chart C in 4 plates each $27\frac{1}{2} \times 10\frac{3}{10}$

sides parallel to sides of Chart & including Sept 24 and Oct 12 - and ^{Chart C} ~~entirely~~ ^{folded} ~~Chart~~ vertically to fold twice the same way.

Can be struck off two on each stone not advisable

4	3	2	1	

1861 Feb. 28th

Mr Watts took Telescopic views for

Oct. 11 - 15 - 18 - 19 - 20 - making the full number.

He brought out paper as
by sample on margin. It
can be had of same quality
 $36^{\text{in}} \times 58^{\text{in}}$ @ \$20 pr Ream
Each sheet will give
6 pages $12^{\text{in}} \times 29^{\text{in}}$ which
will suit well for the
4 charts maps on the
preceding page.

 $27\frac{1}{2} \times 10\frac{3}{10}$

Mr. Watts gave estimates as follows

For Engraving large Chart C in 4 divisions

Lithographs

On Copper

	\$	\$
Engr. Each	15.00	40.00
Striking off \$2 pr 100	10.00	10.00
Paper $\frac{3}{4}$ Ream for		
all four - $\frac{1}{4} (\frac{3}{4}) @ 20$	3.75	3.75
	28 75	53 75
	<u>4</u>	<u>4</u>
Total for the four	<u>115.00</u>	<u>215 00</u>

If lithographed he proposes to etch the curves with acid.

The small Chart A to be reduced to $\frac{1}{2}$ present size
so as to come in on page without folding as follows

On Copper with 5° lines in dots 1° apart and
all lettering & title \$40.00
Striking off @ \$2 ? pr 100 500 copies 10.00

Paper will be that on hand - tinted De la Rue's
of which 4 Reams or enough for 14 plates remains } 0.00
on hand & included in Estimate on p. 26 50.00

For the Curves on p. 115c and 115g Com. Donati
Normal & Parabola
On Copper ^{Sup. 47.} \$20 & for reduction 15 One Plate 35.00
Transfer to stone 1.00
Printing & Paper \$1.75 pr 100 or as I suppose
for printing alone 0.75×5 3.75
Paper tinted De la Rue as above 0.00
39.75

For the plate on p. 115f 16 outlines
On Copper ^{Sup. 47.}
Engr - 25 on Reduction 15 40.00
Transfer 1.00
Printing 4.00
Paper as above 0.00
45.00

1861 March 7

Mem-from On following estimate given to Mr.
Bowditch as ~~memorandum~~

1861 Feb. 15 For views now finished or in hands
of Engraver to date *Vide p. 26* 2151.34
Including Paper.

March 7 Estimate as follows

4 Large Charts on Copper	p 32	160.00
Paper & Striking off for do		55.00
1 Small Chart on Copper		40.00
Striking off of do. (not including Paper)		10.00
Outlines on Copper		35.00
Transfer to Stone		1.00
Printing paper &c for do.		3.75
Plate of 16 Outlines printing paper &c		45.00
		2501.09
Sum. For expense of striking off 2 Frontispieces - as on p. 38		50.00

In addition to the above are the following
for which no definite estimate has been
made

Engravings from D. Arrest		40.00
" Ellery		40.00
" Comet June 1860	2	100.00
" 2 Steel - Miscellaneous	2	100.00
" Chart Hiss Copper		40.00
Wood cuts		100.00
Incidental say		100.00
		3021.09
		3071.09

There will be on account of Engravings
some further charges for tipin paper - extra
binding or perhaps \$50 to \$100 75.00

If over 500 Copies are struck off \$3 for printing
& \$1 for paper pr 100 copies each - say 40 Plates, 100 copies

160.00

1861 March 12

Mr Watts showed first proofs of the two plates containing Sept. 25 - 27. 30th Oct 2.

Took my corrections for the two plates for Sept 8 - 20 23 and 24.

Showed very beautiful impressions from plate for Sept. 29th on thin blue French foreigner writing paper - far superior to any before obtained costs \$2 to \$3 pr Ream.

Plate of 9 figures
as in margin somewhat
more in detail will cost
\$75 (March 21 \$90. enlarged)

Took copy for Comet
June 27 1860 To be
engraved $\frac{2}{3}$ size of orig-
inal. To match plate of
Sept 29th same price. (50.00)



March 18 1861

Mr. Watts brought second proofs of engraving
Feb. views Sept. 8 . 20 - 24 - 25. put in a few
corrections & sent back

Paid Bill for work on the plates of Sept. 25.

& 27th Sept 30 & Oct 2. Feb Views 100.00

By following Order

Order.

(Copy) Cambridge March 18th 1861

Please pay to the order of James W. Watts

One Hundred Dollars 100.00

on account of Bills for engravings for Annals
of Observatory of Harvard College

J. S. Bowditch Esq.

(Signed) G. P. Bond

The proofs on French paper, ^{forming letters} are decidedly better than on the last English paper at \$3 per ream with French say 900 impressions or each plate will cost say \$1.65 for paper and for striking off extra for 500 copies.

In Estimates on p 26 are 31 Steels 3 Copper plates
4 Lithographs.

1861 April 5 Mr Watts brought last proofs of Telescopic
views Sept 8, 20 = 23, 24 = 25-27 =

Paid balance \$90 on the plates by order on
de Bowditch

(Copy)

Cambridge April 5 1861

Please pay to the order of James W. Watts
Ninety Dollars \$90.00

On account of Mr Watts for engravings for Annals of
Observatory of Harvard College

J. I. Bowditch Esq. — Signed 1 E. P. Gould

Also gave to Mr Watts an order on Wm. Beal & Son for
4 Reams Plate paper

New numbering of Plates

1861 April 5th

Concluded on the following arrangement

of the Plates

See p. 3

It is proposed to make the plate of curvature a frontispiece to the part ~~con~~ division of the work comprising Naked eye views and the full length telescopic views of Sept 29 for the division of telescopic subject.

These two are to be struck off on French paper at the rate of 8^{cts} per hundred. This will

add $8 \times 500 \times 2 - 3 \times 500 \times 2 = \$50$

April 19 Mr Watts showed first proofs Telescopic views Oct 4, 5, 6 and 8

1861 Apr. 19 Paid by order copied below Mr Watts bill for work on Plates for Oct 4, 5, 6, 8 Telescopic \$100.80

Order

As on p. 36

Date April - 19 1861.

1861 April 30th (about.) Mr Watts showed proofs on ~~Naked eye~~ Telescopic engravings Oct 4-5-6-8. some corrections were indicated.

1861. May 13 Mr. Watts showed first proofs of Plates
for Oct 9 - 10 - 11 - 15 Telescopic Paid by Order on Mr -

Bowditch for work on above on account	100.00
finishing Sept. 30 Oct 2	50.00
	130.00

Order dated May 13.

May Mr Watts reports favourable work on striking off naked
eye views

1861 June 4 Mr Watts brought corrected proofs Sept 16 & 17. Naked Eye and of
Telescopic views Oct 6 & 8 6th needed further correction. - Oct 9 - 10
good - and Oct 11th & 15th. He finds that ~~the~~⁴ Reams
give 500 perfect impressions for 14 Steels.

Memoranda for numbering Plates

The naked eye views on steel to be numbered as in red ink on

p. 3 - Chart C reduced to $\frac{1}{2}$ size on 1 plate Copper on stone numbered ^{Sup 44-45} XXIV
The lithographs from D'Arrest one plate (to be bound in after
Chart C in 3 sections not designated as plate) will be placed at
end of Part I & to be numbered XXV

Lithograph fac. simile from Ellery end of Part I XXVI

The 4 sections of Chart C are not to be designated as Plates but
as Chart Section I. 11 &c. To be bound in next to Plate XXIV.

The four sections of Chart will not comprise Sept 16-17-18 19 which must be drawn on wood cut [on stone see p. 42]

The telescopic views will next follow as on p 3

Sept 8	Plate XXVII
20	XXVIII
22	26
Oct 20	XLVI

Next will follow

Plate of 16 outlined telescope	XLVII
" outlines parabola-catenary etc	XLVIII

Sept 29 may be bound as frontispiece of Part II comprising telescopic aspect of Comet but is not to be so named in its title

The article on Comet of June 1860 is to have a separate title page & numbering of plates. and extra copies should be struck off.

E

1861 June 4

Plates & engravings to be completed

Comet of June 1860
On Steel June 27 large telescopic views

" Series of 9 views on one plate

Comet of Donati

16 outlines near nucleus

Outlines Parabola Catenary & Normal

Chart A [^{not} reduced to half size]

Chart C in ³ four sections See next page

Woodcut for Sept 16-17-18-19 from Chart C.

Woodcut of Heis chart. ?

Lithograph D Arrest. figures

" Ellipses "

1861 Mr Watts brought proofs of Oct 6 & 8 furnished her
also finished Oct 9 & 10

1 Paid Bill of June 7 including all charges to date \$150
By order of J. S. Bowditch June 8th
Concluded not to strike off on thin French paper as first design
as color is too blue in bright light & makes whole too faint

June 26 Mr Watts showed last proof of Telescopie view
for Oct 18-19-20 on one plate

Paid bill for above \$115.00

By order of J. S. Bowditch

Engraving of Charts A and C

Concluded on following plan - All etched on stone

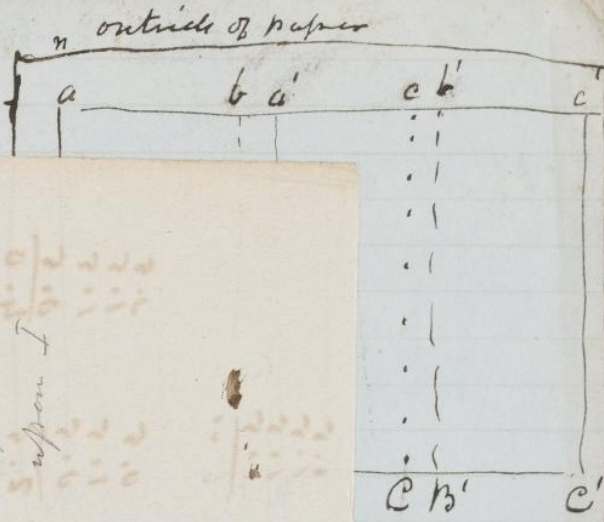
Chart A on sheet of which extreme limits are $18'' \times 29''$
allow say $\frac{1}{2}''$ for binding & $\frac{1}{2}''$ for margin $\frac{1}{2}''$ in each side
leaves

Engraved margin $17'' \times 27''$ To be bound with
~~widest~~ widest side next the stitching

Chart C in three sheets $18 \times 29''$ outside of paper

To be designated as "Sections I, II, III. Charts" — ^{Plate XXVI Sec. I II III Sep 1861}
to be bound with widest side next stitching so as to
present the aspect of tail naturally. & to save room
on upper margin. This arrangement is not very im-
portant however.

Outside of paper for each section $18'' \times 29''$



of bound with
we shall have

Section I 1 Binding
2 margins
Engraving
on outside
= 1.00
1/2 Overlap

Section II 1
2
Engraving
on
= 1.00
1/2 Overlap

0.50 x 1 = 0.50
0.50 x 2 = 1.00
1.50
18.00
16.50
15.00
1.50
Section I on II overlap
" II on

Section I overlaps 15" margin by
II " " 15"

45
12.00
16.50
4.50

C 3 Sections

margin = 1.00
margin = 0.50
d surface = 18.00
= 15.00

1861 Mr Watts brought proofs of Oct 6 & 8 furnished her

also find

1 Paid
By or
Concluded

2.5
1.5
1.5
0.5
4.0

\$150

as color

2.5
1.5
1.5
0.5
6.0

0.5
1.5
0.5
2.5

2.5
5.0

0.50
1.25
0.50

first design

to faint

June 26
for Oct

1 - 1/3
8
4) 5 1.25

0.5
1.0
0.5
2.0

0.5
1.0
0.5
2.0

3.0
7.0

18 width of page

45 + 4x overlap + 6 margin + 3 binding = 54
4 over laps + 6 margin + 3 binding = 9

scopic view

\$115.00

By or

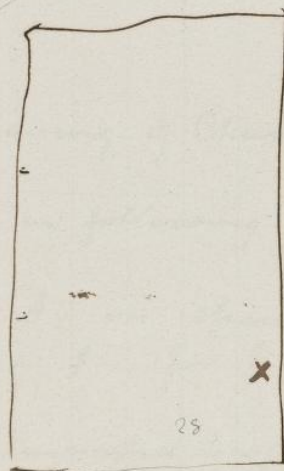
28

Eng
Concluded

Chart
allow
leaves

Chart

Chart



6 1/2" binding 2x margin + overlaps 2x

= 0.5 + 0.50 + 1.0

38 9 1/2
36
45

3 1/2
4 1/2
4.0
4) 4.5 1.12

18" x 29"

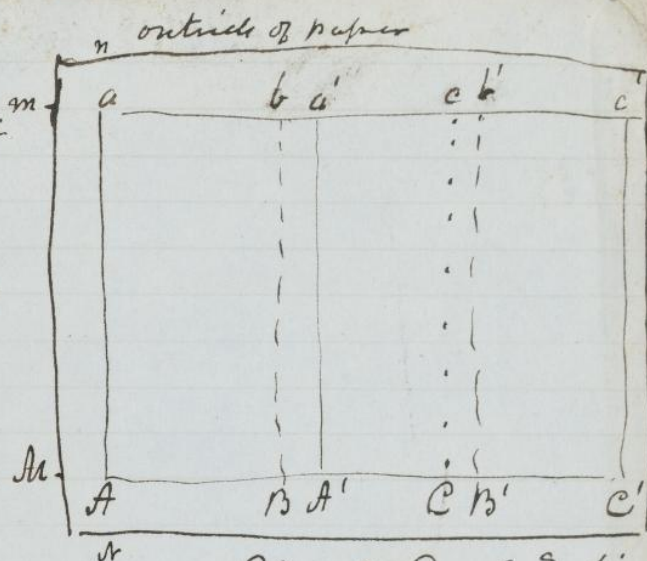
bound with

of paper

to be designated as "Sections I, II, III. Chart
to be bound with widest side next stitching so as to
present the aspect of tail naturally. & to save room
on upper margin. This arrangement is not very im-
portant however.

Outside of paper for each section $18'' \times 29''$

If bound with long side next stitching
we shall have for section I



Section I	1 Binding along side	0.50
	2 margins 0.50×2	1.00
	Engraved space left breadth on outside to overlap Section II	
	$= \frac{1}{3} 45''$	15.00
	$\frac{1}{2}$ Over lap $= \frac{1}{2} 3''$	1.50
	Total	18.00

Chart C 3 Sections

am	= binding + margin	= 1.00
an	= margin	= 0.50
aa'	= engraved surface	= 18.00
	engraved	15.00

Section II	1 Binding	0.50
	2 Margins 0.50×2	1.00
	Engraved space left breadth of two overlaps on Sections I and III	
	$= \frac{1}{3} 45''$	15.00
	$\frac{1}{2}$ Over lap $= \frac{1}{2} 3''$	1.50

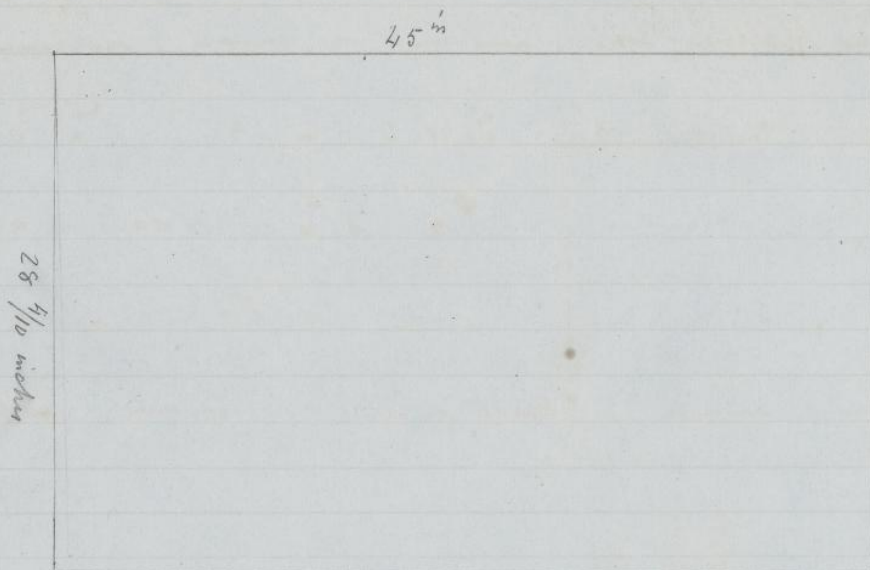
Chart 44

201

7

1.

16



Note that in consequence of giving up engraving
Chart A on copper as proposed on p 39 The numbering
of plates must be altered ^{Done}

Mr Watts to get ^{Done} $1 \frac{1}{4}$ Reams of paper 36×58 @ \$20 a ream.
like sample. This will answer for all four Charts.

1861 July 12 Mr. Watts showed proof of engraving of Comet of
June 27 1860. gave corrections
He has bought paper as above at \$19.50 per Ream.

Gave him order on Mr Bowditch for \$1.50
dated July 12. On account of Bill for printing engravings

1861 July 24

The Mallory will engrave on wood, outlines from
d'Arrest's drawings Aug 24 31 Sept 2 & 23 @ \$0.75 each

The projections of orbit will cost \$5 to \$6 10 dots on comets orbit
& 10 on aster. if not reduced - will cost \$0.75 to \$1.00 to reduce

The outlines from heads of Comet - telescopic views, with lettering
\$1 apiece.

9

I propose the following arrangement of plates & wood
cuts

Engrave on Wood

d'Arrest Aug 24 - 31 Sept 2 Sept 23 Sept 29

Ellery Oct 12 - 14 - 24 Nov 7 - 12.

On Stone

Chart A as on p. 44 full size

Plate XXIV.

Chart ~~A~~ Sept. 16, 17, 18 - 19 ^(1/2 plate) & Chart of Deflection 1/2 plate

Plate XXV.

Chart C remaining dates as on p. 44
in Three Sections I II III

Plate XXVI.

This will bring the numbering of Plates on p. 3 right

On Copper transferred to stone Plate marked I Introduction (15 wts.)
2 Projections of orbit.

A figure is wanted to show axis of brightness Oct. 8.

List of good impressions from Steel-Plates.
from Mr. Watts, July 22. 1861.

[See p. 51.]

Plates deliv^d. May 9.

IX 503
X 505
XI 507
XII 510
XIII 510
XV 506
XVI 508

Plates deliv^d.

VII 508
VIII 510
XIV 509
XX 514
XXVII & XXVIII 526
XXXI & XXXII 504
XXXIII 508
XXXIV & XXXV 507
XXXVI & XXXVII 509
LI & LII 525

Plates del^d June 28.

XVII 511
XVIII 504
XIX 505
XXI & XXII 505
XXIII 512
XXIV & XXV 507
XXVI 514.

The last 100 of LI & LII & VIII are best - of the others, the best have the mark IIII. The 2nd hundred III and so on.

See p 51.

1861 July 27 Mr Watts corrected brought corrected proof of telescopic view of Comet June 27th 1860. taken back for further alteration.

Looked at curves on p 115c & 115f. Normal & Parabola^{& Calculary} on lower part of plate & Normals imposed on upper. \$ 20.00
On Copper as on p 33. Engraving \$ 5
Reduction

Plate p 115f 16 outlines as on p 33 Engraving 25 00
Reduction 5

The Chart of Tail outlines Sept 16 17 18 & 19. Engraving \$10 without plate which will cost \$5. There will be room for another half plate.

Showed Mr Watts Projections of orbits - These two will make

one plate.

The four viz.

4 Normals imposed 2 with Normal. Parabola & Latency 1 Plate

16 Normals 1 ..

Outlines of Tails Sept 16-17-18-19. (Plate I. Intro.) $\frac{1}{2}$ "

with Chart of Deflection & Right axis on same plate $\frac{1}{2}$ "

2 Projections of Orbit (Plate I. Intro.) 1 ..

will be transformed to one stone & this will save
expense ⁱⁿ impressions.

1861 Aug. 6 Mr. Mallory brought proof of 4 wood cuts from
d'Arrest

Took 3 Plates of Ellery to engrave } 0.75 to apiece
" D'Arrest Sept 29th

" 2 Diagrams showing points of intersection
a, a', a" and one illustrating definition of
breadth & axis.

1861

1861 Aug. 9 Mr. Watts sent out proof of Feb. views June 27 1860
and also of 9 views on one plate of Comet same
Comet. returned for dates as they could not be
recognized.

Bottom Marked Feb. views June 27 1860
at top of Plate

Comet III 1860

Observatory of Harvard College June 27 8^h 40^m

At top of plate Plate I.

The plate of 16 outlines is to be Plate II. and marked
at top

Comet III 1860

Observatory of Harvard College

at bottom

3 Columns of dates 3 in each.

Given - Fletcher copy for 16 Outlines. & Parab. & Catenary

1861 Aug 13 Found Deals of plate of 9 figures of

11 Comet June 1860. III. $8' = 1''.00$
Engraving for June 27 $1' 25'' = 1''.00$.

1861 Jan Aug 13 Sent to Mr. Watts corrections of proof of plate of figures Comet June. 1860

1861 Sept. 4th Mr. Watts brought 1st proof of Plate of 16 outlines and of 4 Normals with proof. • & on same plate Parabola Catenary & Normal. Together 2 full plates

He took the large chart C. and the tracings of outlines front and rear edges of the tail.

Also took the two projections of Comet on earth's orbit & Earth on Comet's orbit to be engraved on one plate for \$30. not to include printing &

Paid bills as by orders copied on next page-

There remains to be furnished to Mr. Watts copy as follows:-

Chart Front & rear outlines Sept 16 17 18-19 making half a plate copy ready

Chart of deflection & light axis now in preparation This to be reduced & made into half plate to go with Sept 16-17-18-19

Plate I (Subr.) Title

Estimate.

4 1/2 - 18 1/2	-	20	
Sept 4.	For 500 impressions	4 Plate outlines - Transfer & Printing	\$ 20.00
Sept 20 th	"	" Large Chart each section (See p. 57)	16.00

Copy

Cambridge Sept 4 1861

Please pay to the order of James W. Watts One Hundred Dollars \$ 100.00
 on account of bill for printing plates of Comet of Sonath for Annals of
 Observatory of Harvard College

To J. I. Bowditch Esq.

Signed

E. P. Bowditch

Copy

Cambridge Sept 4 1861

Please pay to the order of James W. Watts
 Twenty Five Dollars \$ 25.00
 on account of bill for lithographs paper

To J. I. Bowditch Esq.

Signed

E. P. Bowditch

1861 Sept. 21 Took to Mr. Watts Chart A. He is to improve the principal circle-stay
 and the front & rear edges of the tail are to be reduced from Chart C. I shall
 then insert the secondary tails upon an impression from the plate.

The lithograph work of Chart C is being done at 215 Washington St.

List of good impressions of Steel plates.
 from Mr. Watts. Sept 20. 1861.

Plate xxxviii	xxxix	509.
" xli	xli	506.
" xlii	xliii	516.
" xliiv	xlv & xlvi	505.

See p. 47

Impression of Plate xxix-xxx not delivered.

1861 Sept 23rd

Paid Mr Watts by order on J. I. Bowditch for engraving,
 9 Figures Comet III 1860 \$ 95
 Large view June 27 Comet III 1860 50

Mr Watts took following Titles

For the General Chart and for the large Chart in 3 Sections

Comet of Donati
 7th M. S. F. Observatory of Harvard College
 Chart of Outlines of Tail.

For plate of Deflection Oct 8 and "

Comet of Donati
 7th M. S. F. Observatory of Harvard College

Chart of Light axis Oct 8

Chart of Outlines of Tail

The disposition of Figures on the Plate will be as on
 next page.

1861 Oct. 2 Mr Watts took chart of Light axis

Outline of engraved surface.

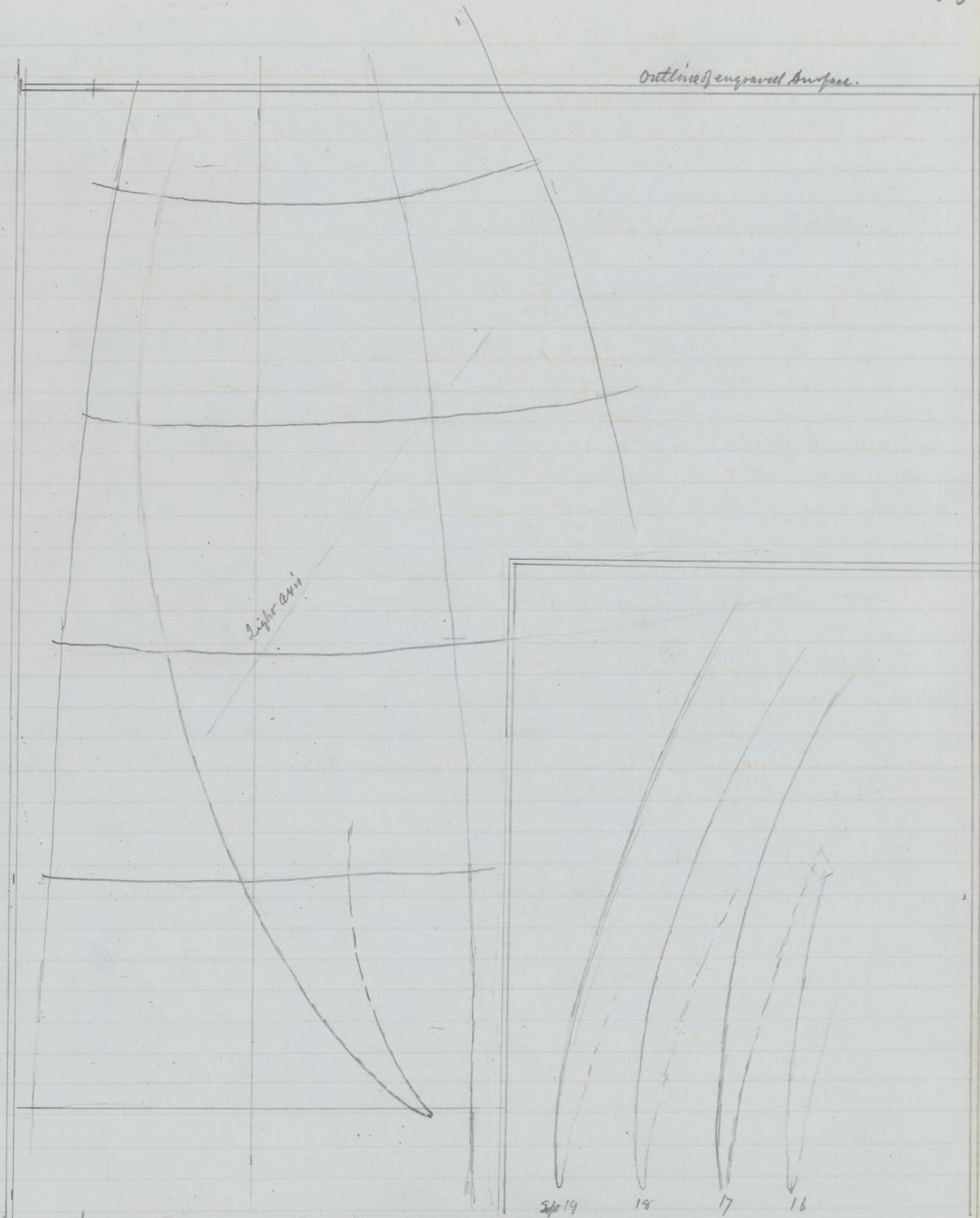


Chart of Light Axis Oct 8
Chart of Longitude
7th m 9th Oct H C

Chart of Outlines of Vair.

1861 Oct. 7th (See p. 5 May 22nd 1860)

Metcalf & Co. gave in the following estimate for printing after seeing first 15 pages of copy. The paper which they proposed is the same as that of the Amer. Acad. Memoirs 19" 82 x 24" 12 Our plate paper is 12 x 10. The quality of Acad. paper is as in margin.

[Copy of Letter & Estimate.]

Cambridge Oct. 7th 1861

Geo. P. Bond, Esq.:-

Dear Sir. We enclose an estimate of the cost of printing a volume of 300 or 500 pages "Annals of the Observatory", - size of the Memoirs of the Amer. Academy. It is made at the same rate charged the Academy, viz. 50cts. per thousand for plain matter, and one dollar for tabular, and press work at 80cts. per token. If the cuts are numerous and require an extra amount of care in printing, an extra charge will be made for cut forms.

It is understood that the work will be in the very best style, with superior ink, and the work generally of the very first quality.

The estimate for paper is made at \$4.50 per ream; but we will purchase paper of any quality desired, and charge no commission for the same. The binding, also, is an estimate depending much on the number of plates and the style in which it is done, - i.e. with or without tissue paper. We will set it as low as possible and charge no commission.

[Signed] Welch, Bigelow & Co.

Cost of 500 pages (500 copies)

70 Reams of paper @ \$4.50 per ream	\$ 315.00
Presswork, 126 tokens @ 80¢	100.80
Binding, say \$10 per 100	50.00
Cover: paper, printing etc.	8.00
	473.80

Cost of 300 pages (500 copies)

42 Reams of paper @ \$4.50 per ream	\$ 189.00
Presswork, 76 tokens @ 80¢	60.80
Binding, say \$8 per 100	40.00
Cover: paper, printing etc.	8.00
	297.80

55

Cost of Composition per page.

Pica - plain matter per page	\$0. 93 1/2
Long Primer — do. — do. —	1. 47 1/2
Long Primer tabular — do. — do. —	2. 95

Welch, Bigelow & Co.

Cambridge, Oct. 7. 1861.

Paper about 15 cts. pr. lb. is recommended by Mr. Bigelow.

Oct. 8. 1861. Saw Mr. Bigelow. He says that no additional charge will be made for the text in foreign languages.

Our ordinary type used for Annals is Pica and for tabular matter long primer. They will do the work on following estimate.

Paper to cut full 10 x 12 in. @ \$4.50 pr. Ream.

500 Copies of 500 pages

Text in Pica 450 pages

Tabular matter in Long primer 50 pages.

Final Estimate as follows: — 500 pages 500 copies

Prep work. Binding as above

Composition 450 pages plain - Pica @ 93 1/2 cts pr page. \$420.75

" 50 " Tabular Long primer @ 2.95 147.50

568.25

479.80

568.25

Electrotyping 500 pages

242.44

Boxing plates for storage

12.00

For a moderate number of ordinary woodcuts no additional charge

1296.49

Actual cost

1400.00

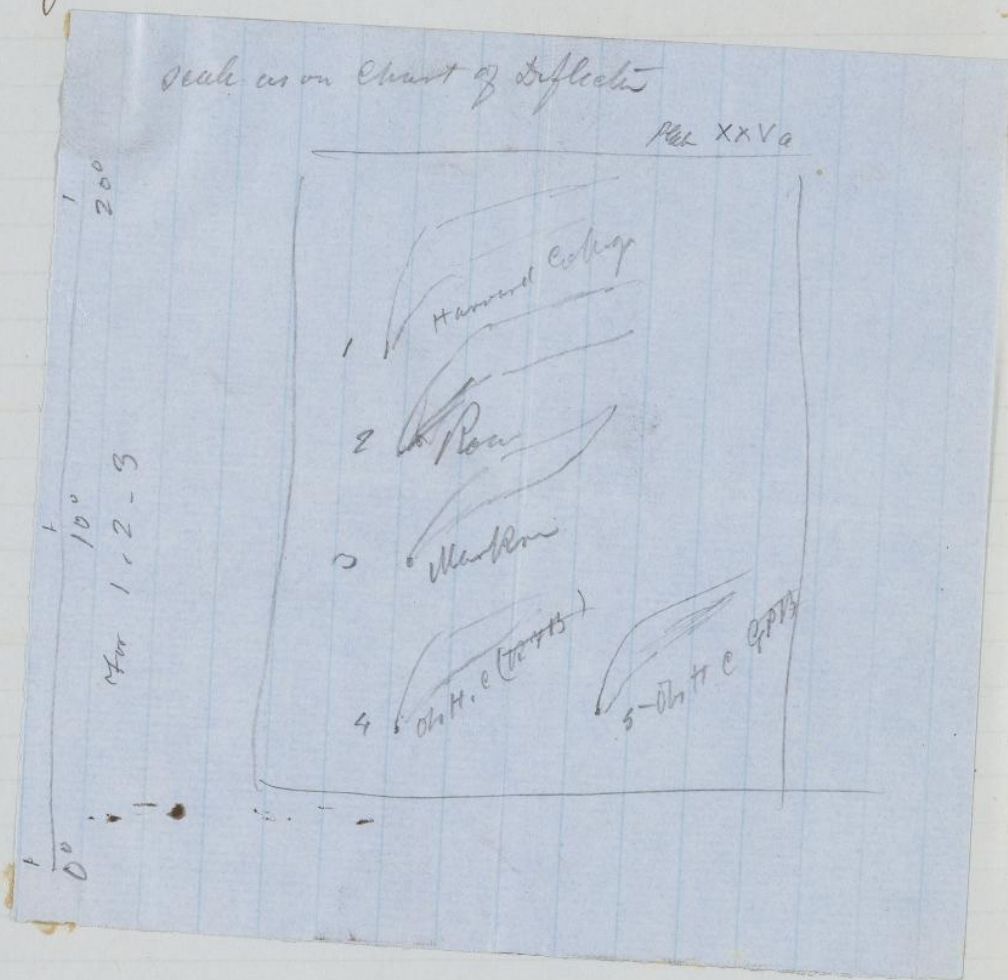
See p. 63.

Oct 21¹⁹ Ordered of Mr Watts for Proj. Levering 750 impressions
 Plate of Parabola a Catering for Proc. Am. Academy.
 and 500 Ob. H.C. additional to regular issue

Cost for 750 including Bible paper - small charges say \$13.50

Oct. 24th 1861 Paid by following order - Bill of Mr Watts for
 printing Plates of Comet of Donati. 1858. One Hundred Dollars
 on account.

Order on J. S. Bowditch - Oct. 24.



1861 Nov 15

Mr Watts brought proof of Chart of Deflection. gave corrections

Paid by Order on Mr Bowditch Bills for engraving Plates
 XLVII XLVIII 1 Int. & on account Plate XXV \$10 Copper 5
 Light 44 25.

Found that the Lithographer would not be willing to part with
 the stone proposed for Plate XXVI. Sections I, II, III. In consequence
 Mr Watts ~~proposed~~ gave estimate as follows

If lithographed as originally proposed

	Lithography	66
	Extra work - overlapping etc.	10
500 Impressions Each section	~~\$18 x 500~~ \$17 x 3 =	51
Paper	6 x 3	18
		<u>139</u>

If stone is not obtained we must have 500 extra impressions

500 extra Impressions	3 x 17	51
" Paper	3 x 6	18
		69
		<u>69</u>

Total Cost of 1000 impressions Lithographs 208

If on copper	Cost of plates	3 x 15	45
	Engraving & lettering		90
	500 impressions	3 x 17	51
	Paper	3 x 6	18

Total for 500 on Copper - 3 Sections Plate XXVI. 204

As the work will be better done on copper & the plate can be preserved
 concluded to have copper instead of stone.

Dec 20 1861 Mr Watts presented bill for printing
plates on dark ground in full to date.

\$100.00

Paid by order on J. S. Bowditch -

1862. Jan. 8th.

Meprs. Welch & Bigelow gave in account for printing "Annals" Vol. III to date
144 pages & Paper for whole Edition as follows, viz: -

Jan. 8. To Elec. 144 pp. "Annals of Observatory"

90 pp. - pica 1926 = 173.340

$27\frac{1}{2}$ " l.p. - 2992 = 82.280

$117\frac{1}{2}$ pp. , 255.620 ms. @ 75¢, \$191.71

$26\frac{1}{2}$ " l.p. Tab. 79.288 . 1.25, 99.11

Correcting to date on same 92 hrs. .30 27.60

10 Boxes .75 7.50

325.92

Less 5¢ for Cash.

16.29

309.63

70 Rms. Paper. 20 x 24 - 36 # 12 1/2¢ \$4.50.

315.00

\$624.63

The difference between above acct. & estimate on p. 54 & 55 is explained as follows:

- (1) The Page of Annals is longer by one line than "Academy" page on which estimate was founded. This increases cost of composition by about 1/37th part for Pica, or from 93 1/2 cts per page to 96 cts for Pica.

For Long Primer from \$1.47 1/2 to \$1.49 1/2

" Tabular 2.95 " 2.99

- (2) The Electrostyping at 25 cts per thousand becomes for Pica 48 cts per page.

Long Primer 75 " "

Tabular " 75 " "

Memorandum from Mr. Bigelow Jan 9th 1862

Open page 1920 ems. = .96 cts for comp.
 48 " " Elects.
1.44 - per page.

12. Primer 2992 ems. = \$1.49 1/2 per comp.
 .75 " Elects.
2.24 1/2 per page.

Tabular 2992 ems. = 2.99 for comp.
 .75 " Elects.
3.74 per page.

1862 Jan. 8th

Mr. Welch & Bigelow gave in account for printing "Annals" Vol. III to date 144 pages & Paper for whole edition as follows -

Here Copy Bill.

The difference between above acct. & estimate on p 54 & 55 is explained as follows:

- 1) The page of Annals is longer by one line than "Academy" page on which estimate was based - This increases cost of composition by about $\frac{1}{37}$ th part ^{per page} or from 93½ cts per page to 96 cts for Pica

For Long Primer from \$1 47½ to 1.49½
 " Tabular 2 95 " 2.99

- 2) The Electrotyping at 25 cts per thousand ~~lines~~ becomes
 for Pica 48 cts per page
 Long Primer 75 " "
 Tabular " 75 " "

Our page is for Pica	1920 ems -	Composition	0.96
		Electrotyping	<u>0.48</u>
		Per page	<u>1.44</u>
Long Primer	2992 ems	Comp	1.49½
		Elec.	<u>0.75</u>
		Per page	<u>2.24½</u>
Tabular Long Primer		Comp.	2.99
		Elec.	<u>0.75</u>
		Per page.	<u>3.74</u>

Our Page is for Pica	1920 uns.	Composition	0.96
		Electrotyp ^s	0.48
		Per Page.	1.44
Long Primer.	2992 uns.	Comp.	1.49 1/2
		Elec ^t	0.75
		Per Page	2.24 1/2
Tabular Long Primer		Comp.	2.99
		Elec ^s	0.75
		Per Page	3.74

Above is from Memorandum from Mr. Bigelow. Jan. 9th. 1862.
Pica Page 1920 uns.

[Copy]

Boston. Dec. 30. 1861.

Harvard College Observatory to

Kilburn & Mallory

Sr.

To	Eng ^r	2	Diagrams of Comet @ \$3.00	\$ 6.00
	"	12	" " small Comet @ 0.75	9.00
Oct. 31	"	1	" " "	1.50
				<u>\$ 16.50.</u>

The above accounts of Welch & Bigelow and Kilburn & Mallory approved as per letter to Orsiak Quincy Sr. Esq. dated Jan. 9th. 1862.

Feb. 20th 1862

Paid Mr. Watts bill of \$105 as per order of J. P. Bowditch.

Mr. Watts presented the following memoranda, inclusive of his bill.

Observatory of Harvard College
Memoranda of work in hand, and
finished, not yet paid for.

Large Chart of Outline of tail, 3 sections; 2 finished; 1 unfinished.	\$90.00
Copper for same 3 plates \$15 each	45.00
Small Chart (Outline of tail and axis of secondary tail) - finished	
first estimate on drawing	x 40.00
Extra set of degree lines	x 30.00
Reductions of comets from large tracings	x 18.00
Copper \$15 alteration of title \$2	x 17.00
Chart of Nebula in Orion; Estimate 25¢ Extra reduce 8¢ copper	x 40.00
Original outlines from Rome - Masker & Harvard College	
Reduction 1/5 copper 5¢ Engraving \$20 - -	x 30.00
	<u>\$310.00</u>

Printing and paper

One ream of thin blue paper and experiments with it	x 4.50
Impressions from plate of Parabola &c. for Annals	x 7.00
Printing Large Chart of Outline of tail	51.00
= Small Chart of Outline of tail and axis of secondary tail	17.00
= Chart of Nebula in Orion	10.00
Printing & paper, four small plates, Set of 2 A - Parabolas - Out of H - Orbit	20.00
= Rome - Masker - Harvard College &c	7.00
Printing two dark plates of Comet 11-1860	30.00x
	<u>\$146.50</u>
Engraving - copper &c	310.00
Dark plate of Nebula in Orion	125.00
	<u>\$581.50</u>

Mr. Watts gave an estimate for sketching telescopic views, negative on one large plate to fold, on thin paper: engraving, & he thinks the copper included \$1. a piece.
 Lithographs with average 0.75 cts each.

March 21. 1862. ~~100 Plate VIII - 100 Plate IX~~ Returned.
 .. 25. ~~200 Plate IX - 200 Plate IX~~ Returned

Plate XVI. 23 impr.

Plate XVII. 11 impr.

Plate. I - II - 10 impr.

Plate X. 15 impr.

Plate XL. 19 impr.

Plate. XXXVIII - XXXIX - 25 impr.

9
2
xenograph with coverage 0.75 ch each.

Size of Bible paper $36^{\text{in}} \times 58^{\text{in}}$ See p 45

1862 Feb 27 Sent to Mr Watts collection of all the original telescopic views of Comet to be lithographed together with detailed directions for arrangement &c.
For list of figures 141 in all see "Annals
Comet 1858 (rough copy) p 91c 91d & 91e.

Memoranda for Engraving Lithograph Telescopic Views.

N.B. To have specimen of Lithograph on Bible paper.

The Bible paper is $36^{\text{in}} \times 58^{\text{in}}$. Will make four sheets having engraved surface $17^{\text{in}} \times 27^{\text{in}}$ each, like all the charts of the tail.

See. To have two of Perseus figures where Unruh's is very large.

On the scale of Munich lithographs we have room for 10 figures on a surface of 27^{in} that is $\frac{17 \times 27}{20} \times 10 = 170$ figures for one Chart.

The list on p 91c contains 141 figures only, so that there will be room enough for all.

They will be arranged so that the creases in the folding of the paper (to be faintly indicated by mark or dot in margin) shall not impair the figures.

1st in groups in order of date

2nd, in each group in order of telescopic advantage of observation.
as on page 91c, 91d, and 91e.

3rd. The number and name of place to be inserted with each.

March 3 Mr Watts showed plan for Lithographs of Telescopic views. & took memoranda of corrections for Plates XLVII and XLVIII -

Plates to be numbered as follows

"Comet of Donati 1858"
Plate XLIX "General Chart of Telescopic Views
" L 9 Views Comet June 1860
" LI 1 Full length "

March 4th. The following impressions of Comet Plates to be sent to Boston to be pressed.

Plate XIV. 5 impr^s

Plate XLII. 7 impr^s

Plate. XXXI-XXXII. 8 impr^s

Plate XII. 16 impr^s

Plate XLII-XLIII. 22 impr^s

Plate. XXXIII. 11 impr^s

Plate XVI. 23 impr^s

Plate XVII. 11 impr^s

Plate. I-II. 10 impr^s

Plate X. 15 impr^s

Plate XL. 19 impr^s

Plate. XXXVIII-XXXIX. 25 impr^s

1862 April 1st Paid E. D. Harris as by Bils on file
for work in touching engraving in watercolor. \$50 by
following order

(Copy)

Cambridge April 1st 1862

Please pay to the order of Edward D. Harris on account
of Bils for work on Engraving for "Annals of Observatory of
Harvard College" Fifty Dollars \$ 50.00

To J. S. Bowditch Esq.

Signell

G. P. Bond.

Memorandum of Impressions of Copper Plates transferred to Stone - about May 12 '62

Plate - Outlines from Original Drawings.	517 imprs.
Projection of Earth's Orbit upon Corneli's Orbit - Projection of Corneli's Orbit upon Earth's Orbit -	503 imprs.
Chart of Deflection of Light Axis - Chart of Outlines of Tail -	503 imprs.
Normal Outlines Parabola & Catenary	501 imprs.
Normal Outlines of Head	500 imprs.

June 6 Paid Mr Watts in full for Engraving
Printing etc. as by State Receipt on file \$273.50
by Order on Mr Bowditch

July 3 Paid E. D. Harris in full for Touching Engraving
in water color. as by Receipt on file 75.00

Mem. July 12 - 1862 - Agreement made with A. Meisel for procuring
lithograph on stone for two years, see paper on file.

Copy of Account rendered by Welch & Bigelow for
printing from p. 144 to end of vol III Annals. "Account of Comet etc"

Cambridge July 1st 1862

Ob. Harvard College

To Welch & Bigelow &c Dr

To Elec. Annals of Obs p. 144 to end

189 pp Pica - 1926 - 364.014

37 " L.p. - 2992 110.704

474.718

75c

\$

356.04

22 " Tab.

65.824

1.25

82.28

Correcting 100 hours proofs

30

30.00

14 " plates

37 1/2

5.25

3 Boxes additional

75

2.25

Printing 500 copies of do

91 Tables plain forms

80

72.80

8 " cuts

1.50

12.00

Covers Comp. Proof & Paper

8.00

Binding 2 Cop. Full Turkey

20.00

50 " Cloth Gilt Top

1.20

60.00

455 "

0.45

202.50

851.12

Cr

By 10 Rms Paper

\$ 4.50 45.00

" dict 5% on 468.62 Printing

28.43

73.43

777.69

Paper

Dr to Binding 25 copies 1.05

26.25

Used in printing

50 1/2

803.94

Binding

2

Or as above

10

Amount purchased.

70

Above account in full for printing Vol. III Annals of Observatory of Harvard College
examined & approved -

Cambridge Oct. 2 1862

(Signed)

G. P. Bond

1863 April 11th Mr Watts brought last Proof of Plate of Orion which was corrected & taken back to have a few specimens numbers struck off. His Bill for engraving to date for \$237^{currency} as by receipt on file was presented & paid by order as follows.

Copy of Order

Cambridge April 11 1863

Richard F. Bond Esq

Watts Please pay to the order of James W. \$237.00

Two Hundred and Thirty Seven Dollars
For Engravings of Nebula of Orion and Charts
of Stars for Annals of Observatory of Harvard College

(Signed) G. P. Bond

The above to be paid out of deposit of \$306.27 in hands of Wm Bond & Son converted into Gold March 9 at 56 Premium.

Note note to R. F. B requesting him to pay the \$237 in currency if convenient otherwise in Gold at ruling premium.

Note. Aug 5 1863 On June 30 1863 Received of Wm Bond & Son
Balance of above deposit viz - $306.27 - 237.00 = \$69.27$

Aug 24 1863 Vol. IV Part I of Annals was printed April
1863 from forms composed for Memoirs of American Academy

Bill of Welch & Bigelow including prep work - paper & binding
but not including compositions (paid for by Am. Academy) excepting
for title page cover & introduction amounted to \$88.96 from
which 5.00 = cost of binding, was subsequently deducted. The
binder having cut the margin contrary to instructions.
Net amount of Bill $88.96 - 5.00 = \$83.96$ approved for
payment from Sturgis fund.

Engraving & Printing

Dr		Observatory of Harvard College in account			
1860				\$	
June	29	To James W. Watts	Engraving as by Bill	130	00
Aug	28	"	"	11.5	50
Oct.	5	"	"	110	00
"	24	"	"	112	00
Nov	5	Bill of Exchange - to	De La Rue & Co	182	85
Dec	20	To James W. Watts	Engraving as by Bill	40	00
1861					
Jan	14	"	"	100	00
"	25	"	"	52	50
"	31	Wm. Bond & Son	Duties, Freight &c	42	89
Feb	4	James W. Watts	Engraving &c	67	50
"	15	"	"	105	40
March	18	"	" p. 36	100	00
April	5	"	" p. 37	90	00
	19	"	" p. 38	100	40
May	13	"	"	130	00
June	8	"	" p. 42	150	00
	29	"	" p. 42	115	00
July	12	"	Printing of Engravings p. 45	150	00
Sept	4	"	Printing of Engravings p. 51	100	00
"	4	"	1 1/4 Reams Bible paper "	25	00
"	23	"	Engraving p. 52	145	00
Oct.	24	"	Printing of Engravings p. 54	100	00
Nov.	15	"	Engraving p. 57	125	00
Dec	20	"	Printing of Engravings in full		
		for Dark ground plates to date	p. 59.	100	00
1862					
Feb	20	James W. Watts	Engraving as by Bill	105	00
April	12	"	"	201	50
		(Bill of April 12 includes \$40 paid on Plate of stars of Nebula in Orion)			
	15	To E D Harris	Work on Engravings	50	00
June	6	James W. Watts		273	50
July	3	E. D. Harris		75	00
Jan.	8 th	Welch and Bigelow	printing etc 144 p.p. Annals	624	63
Oct.	3	"	" in full	803	94

Engraving & Printing
with G. P. Bonce

83

Cr.

By order on J. S. Bowditch Esq.

130 00

"

115 50

"

110 00

"

112 00

"

182 85

"

40 00

"

100 00

"

52 50

"

42 89

"

67 50

"

105 40

"

100 00

"

90 00

"

100 00

"

180 00

"

150 00

"

115 00

"

150 00

"

100 00

"

25 00

"

145 00

"

100 00

"

125 00

Dec 20

"

100 00

Feb 20

"

105 00

April 12

"

201 50

April 1

"

50 00

June 6

"

273 50

July 3

"

75 00

By amount paid Melos & Bigelow by Josiah Quincy

1428 57

Engraving & Printing

Observatory of Harvard College in Account

Dr

1863

March 9	Premium for Gold / 56 Brokerage / 1.2 = 0.572		
	306.27 currency = 194.83 Gold Deposited in Safe of Mr. Bond & Son.		121.44
April 11	To James W. Watts Engraving on Nebula of Orion Steel plate & Copper plate. impressions etc as by Receipt on file	237.00	
	In 1862 April 12 \$40 has been paid Mr. Watts for work on Copper plate. Chart of Stars in Orion		
June 30	By Balance of Deposit recd from Mr. Bond & Son 306.27 - 237.00 =	69.27	
Aug 19	* Bills Welch & Bigelow printing Annals Vol. IV Part I. Approved for Surge's Fund	83.96	
	* Transferred to special account.		
Dec 4	Bills James W. Watts Printing 500 impressions from Plate of Nebula of Orion	20.00	20.00
	Cash to Balance		257.00
			49.27

with G. P. Bond

Cr

1862

Nov 29 Received of J. I. Bowditch - funds to be
expended in Engravings for Annals etc

\$ 306.27

Numbering of Plates & Wood cuts.

Numbering of plates

Sept 4 1851

Adopted Titles

Sept 4 1858 see notes

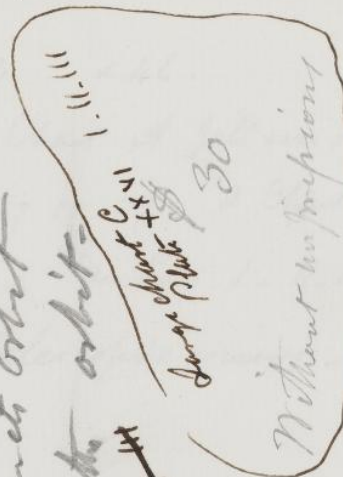
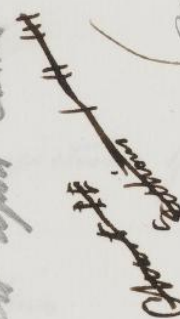
Plate I (Intro.)

Comet of Donati 1858

Proposition of Earth's orbit upon Comets orbit

Proposition of Comets orbit upon Earth's orbit

1 Plan x 1/4



draw as to paper

Indicate plate

Sept 16 17 18 19

Chart of Deflection

Normal outline of Head

Comet of Donati 1858

Plate XLVII

Plate XLVI

XXV

XXVI

XXVII

XXVIII

XXIX

XXX

XXXI

XXXII

XXXIII

XXXIV

XXXV

XXXVI

XXXVII

XXXVIII

XXXIX

XL

XL I

XL II

XL III

XL IV

XL V

XL VI

XL VII

XL VIII

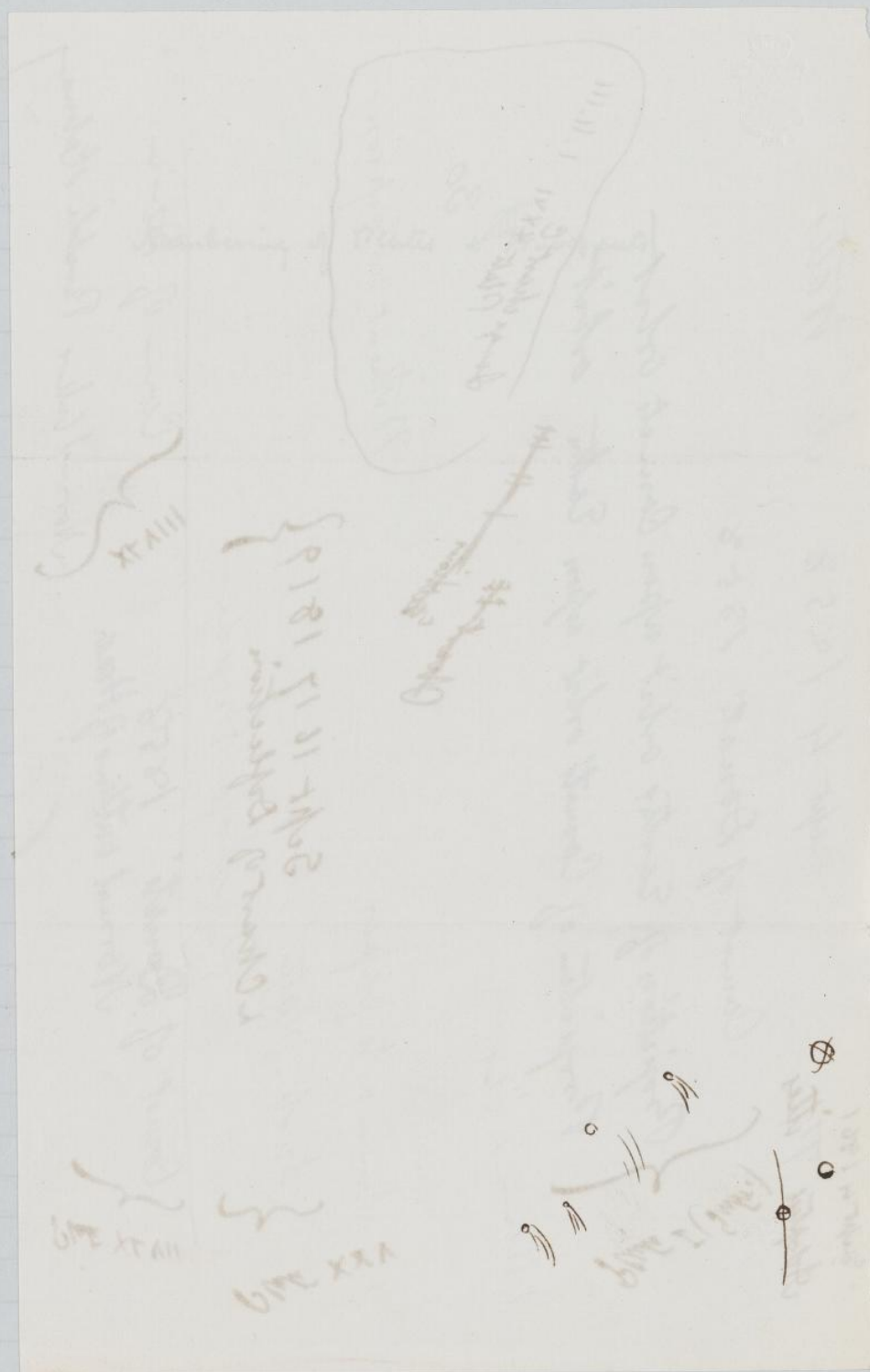
XL IX

XL X

Plate of Donati, Oct 8
see notes on
Oct 11 C

to XLVI inclusion

Introduction



Numbering of plates

Sept 4 1861

At on p.p. 3 & 46.

Chart A full size on stone Plate XXIV

Sept 16 17 18 19 & Chart Deflection " XX V XXV(a)

Chart C - Sections I - II - III " XXVI -

Telescopic views - XXVII to XLVI inclusive

Plate of tracing, Oct 8
Marshall Remond
L On H C

Plate of Two projections of orbit Plate I (Introduction)

Plate of 16 outlines Plate XLVII

Parabola Catenary &c XLVIII

