

T H E
LADIES and GENTLEMENS
D I A R Y,

O R,
ROYAL ALMANACK;

For the Year of our LORD, 1779 :

Being the Third after Bissextile, or Leap Year,

A N D
The Nineteenth Year of the Reign of his Present Majesty
George the Third.

By REUBEN BURROW,
Late Assitant Astronomer at the Royal Observatory,
and Teacher of the Mathematics.



L O N D O N :

Printed for T. CARNAN, in St. Paul's Church Yard, who disposed of
the Stationers Company of the exclusive Privilege of Printing
Almanacks, which they had unjustly monopolized 170 Years.

Faint, illegible text, possibly bleed-through from the reverse side of the page. The text is arranged in several paragraphs and is mostly illegible due to fading and low contrast.

Year	Month	Day	Event
1870	Jan	1	...
1870	Jan	2	...
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1870	Jan	27	...
1870	Jan	28	...
1870	Jan	29	...
1870	Jan	30	...
1870	Jan	31	...

ECLIPSES in 1779.

This year there will be Five Eclipses, Three of the Sun, and Two of the Moon, which will happen in the following Order: The First Eclipse is of the Sun, which happens on the 16th of May, at Six Minutes past One in the Morning, invisible. The Second is of the Moon, partly visible, and happens the 30th of May, beginning Two Minutes past Three in the Morning; Middle Fifty-Five Minutes past Four, and ending at Forty-Eight Minutes after Six; Digits eclipsed $15^{\circ} 47'$. The Third is of the Sun, visible, and happens the 14th of June; Beginning Seven Hours Eighteen Minutes in the Morning; Middle at Seven Hours Fifty-Nine Minutes, and ends at Eight Hours Forty-Three Minutes; Digits eclipsed $3^{\circ} \frac{1}{4}$ on the North limb. The Fourth is of the Moon, visible; and happens the 23d of November; Beginning at 6 Hours $7\frac{1}{2}$ Minutes in the Afternoon; Middle 7 Hours $57\frac{1}{2}$ Minutes; and ends at 9 Hours $47\frac{1}{2}$ Minutes; Digits eclipsed $20^{\circ} 42'$. The Fifth is of the Sun, and happens the 7th of December, at 10 Hours 21 Minutes, but invisible.

COMMON NOTES, 1779.

Golden Number	-	-	13	Dominical Letter	-	-	C
Cycle of the Sun	-	-	24	Roman Indiction	-	-	12
Epact	-	-	12	Number of Direction	-	-	14

Year of Julian Period 6492.

The FOUR QUARTERS of the YEAR.

The Spring Quarter begins this Year the 20th of March, at 5 Hours 53 Minutes after Noon; at which time the Sun enters the *Equinoctial Sign Aries*, making equal Day and Night all the World over.

The Summer Quarter commences the 21st Day of June, at 4 Hours 3 Minutes, Afternoon, the Sun then entering into the *Sign Cancer*, making the longest Day to all the Northern, and the shortest to all the Southern Parts of the World.

The Autumnal Quarter begins the 23d Day of September, at 5 Hours 35 Minutes in the Morning, at which Time the Sun enters *Libra*, making again equal Day and Night to all the World.

The Winter Quarter begins the 21st day of December, at 9 Hours 57 Minutes, Afternoon, the Sun then entering into the *Tropical Sign Capricorn*, making the shortest Day to the Northern, and longest to the Southern Inhabitants of the World.

WEIGHT and VALUE of the GOLD and SILVER COINS of England.

	WEIGHT.	VALUE.
	dwt. grs.	l. s. d.
<i>GOLD.</i>		
A Guinea	5 9,438	1 1 0
Half Guinea	2 16,719	0 10 6
Quarter Guinea	1 8,359	0 5 3
<i>SILVER.</i>		
A Crown	19 8,519	0 5 0
Half Crown	9 16,259	0 2 6
Shilling	3 20,903	0 1 0
Sixpence	1 22,451	0 0 6

Current Gold Coin must weigh as follows.

	dwt. grs.
Guineas	5 8
Half Guineas	2 16
Quarter Guineas	1 8

Full Moon 2 day 4 h. 13 m. afternoon
 Last Quarter 9 day 0 h. 34 m. afternoon
 New Moon 17 day 5 h. 38 m. afternoon
 First Quarter 25 day 1 h. 27 m. morning

Sun enters Aquarius
 20d. 2h. 32m. morn.
 Apparent time.

1	F	Circumcision	8	53	55	23	18.	6	M	40	15
2	S	Aldebaran, So. 9h. 33m.	8	53	55	22	55	D	rises		16
3	C	2 S. aft. Christ.	8	43	56	22	49	4	A	54	17
4	M		8	33	57	22	43	6		18	18
5	Fr	Jupiter rises 10h. 29m. N.	8	23	58	22	37	7		41	19
6	W	Epiphany. Twelfth Day	8	13	59	22	30	9		2	20
7	Th		8	04	0	22	22	10		22	21
8	F	Lucian	7	59	4	1	22	11		36	22
9	S		7	58	4	2	22	6	Morn.		23
10	C	1 S. aft. Epip.	7	57	4	3	21	57	0	49	24
11	M	Plov Mond.	7	56	4	4	21	47	1	58	25
12	Fr	Old N. Y. day:	7	55	4	5	21	38	3	9	26
13	W	Camb. T. b. Hilary.	7	54	4	6	21	28	4	18	27
14	Th	Oxford Term begins	7	53	4	7	21	17	5	23	28
15	F	Exchequer opens	7	51	4	9	21	6	6	25	29
16	S	[Day.	7	50	4	10	20	55	11	13	30
17	C	2 S. aft. Epip. Old Twelf.	7	49	4	11	20	43	D	fets	1
18	M	Q. C. b. d. kept. Prisca.	7	48	4	12	20	31	4	A	45
19	Fr		7	46	4	14	20	18	5	53	3
20	W	Fabian. In 8 d. Hil. 1 Ret.	7	45	4	15	20	5	7	4	4
21	Th	Agnes	7	44	4	16	19	52	8	17	5
22	F	Vincent	7	42	4	18	19	38	9	29	6
23	S	Hilary Term begins	7	41	4	19	19	24	10	43	7
24	C	3 S. aft. Epip.	7	40	4	20	19	10	11	59	8
25	M	Conversion of St. Paul.	7	38	4	22	18	55	Morn.		9
26	Fr		7	36	4	24	18	40	1	20	10
27	W	Fr. A. Fr. b. In 15d. Hil.	7	35	4	25	18	25	2	41	11
28	Th	[2 Ret.	7	33	4	27	18	9	4	4	12
29	F	Sirius. S. 9h. 46m.	7	31	4	29	17	53	5	22	13
30	S	K. Char. I. Martyr.	7	30	4	30	17	37	6	31	14
31	C	Septuagesima Sunday	7	28	4	32	17	20	7	24	15

Days	L. of D.	Days inc.	D. breaks	Sun East	Tw. ends	Cl. bef. S.	7 Stars So.
1	7 51	0 7	5 59	4 41	6 1	4 8	8 A 45
6	7 58	0 14	5 56	4 43	6 4	6 24	8 23
11	8 8	0 24	5 53	4 46	6 7	8 29	8 1
16	8 19	0 35	5 48	4 49	6 12	10 19	7 40
21	8 32	0 48	5 43	4 53	6 17	11 52	7 19
26	8 47	1 3	5 37	4 57	6 23	13 5	6 58

Date	Description	Debit	Credit	Balance
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Full Moon	1 day 3 h. 3 m. morning	Sun enters Pifces 18d. 5h. 25m. Apparent time.
Last Quarter	8 day 6 h. 37 m. morning	
New Moon	16 day 11 h. 36 m. morning	
First Quarter	23 day 9 h. 3 m. afternoon	

D	W	Sundays, Holidays, &c.	Sun rises	Sun sets	Sun decl. S.	D rises & sets	D's age
1	M	Mars rises 11h. 39 night	7 27	4 30	17 3	D rises	16
2	Tu	Purif. V. Mary. Candle. d.	7 25	4 35	16 46	6 A 24	17
3	W	Blase. Mor. Purif. 3 Ret.	7 23	4 37	16 28	7 49	18
4	Th	Antarican So. 7. 10	7 21	4 30	16 10	9 9	19
5	F	Agutba	7 20	4 40	15 52	10 24	20
6	S		7 18	4 42	15 34	11 30	21
7	C	Sexagesima Sunday	7 16	4 44	15 15	Morn.	22
8	M		7 15	4 45	14 56	0 52	23
9	Tu	In 8 days of Pur. 4 Ret.	7 13	4 47	14 37	2 1	24
10	W	Capella South 7h. 23m	7 11	4 49	14 17	3 10	25
11	Th		7 9	4 51	13 58	4 11	26
12	F	Hilary Term ends [15 N.	7 7	4 53	13 38	5 8	27
13	S	O. Cand. d. Jupiter 11. 10.	7 5	4 55	13 18	6 0	28
14	C	Shrove Sunday <i>Valentin</i>	7 3	4 57	12 57	6 39	29
15	M		7 1	4 59	12 37	D sets	1
16	Tu	Shrove Thesday	6 59	5 1	12 16	4 A 52	2
17	W	Ash Wednesday. Camb.	6 58	5 2	11 55	6 5	3
18	Th	[Term divide]	6 56	5 4	11 34	7 18	4
19	F		6 54	5 6	11 13	8 32	5
20	S		6 52	5 8	10 51	9 46	6
21	C	1 Sunday in Lent	6 50	5 10	10 29	11 6	7
22	M	Antares South S. 11	6 48	5 12	10 7	Morn.	8
23	Tu		6 46	5 14	9 46	0 26	9
24	W	St. Matth. Ember Week	6 44	5 16	9 24	1 49	10
25	Th		6 42	5 18	9 1	3 8	11
26	F		6 40	5 20	8 39	4 18	12
27	S	Aldebaran. So. 5h 41m.	6 38	5 22	8 16	5 15	13
28	C	2 S. Lent. Hare h. goes o.	6 36	5 24	7 54	6 1	14

Day	Ln. of D.	Days inc	D. brooks	Sun Eas.	Tw. end	Ch. bet S.	Stars So
1	9 7	1 23	5 29	5 3	6 31	14 5	6 A 33
6	9 24	1 40	5 22	5 6	6 38	14 32	6 13
11	9 42	1 58	5 14	5 14	6 46	14 40	5 53
16	10 1	2 17	5 5	5 20	6 55	14 29	5 34
21	10 20	2 36	4 57	5 26	7 3	14 0	5 15
26	10 40	2 46	4 47	5 35	7 13	13 15	4 55

1779.

March hath XXXI Days.

Full Moon	2 day 2 h. 12 m. afternoon	S. enters Aries.
Last Quarter	10 day 2 h. 42 m. morning	20d. 5h. 53m.
New Moon	18 day 2 h. 52 m. morning	afternoon.
First Quarter	25 day 4 h. 31 m. morning	Apparent time.

M	David	6 34 5 26 7	31	6 M 33	15
Tu	Chad.	6 32 5 28 7	8	☽ rises	16
W	Mars rises 11h. 50m. N	6 30 5 30 6	45	6 A 42	17
Th	Capella South 5h. 59m.	6 28 5 32 6	22	8 2	18
F		6 26 5 34 5	59	9 18	19
S		6 24 5 36 5	36	10 33	20
C	3 Sund. in Lent. Perpetua	6 22 5 38 5	13	11 47	21
M		6 20 5 40 4	49	Morn.	22
Iu		6 18 5 42 4	26	0 58	23
W	Regulus So. 10h. 32m.	6 16 5 44 4	2	2 6	24
Th		6 14 5 46 3	39	3 7	25
F	Gregory M.	6 12 5 48 3	15	3 59	26
S	Jupiter rises 5. 33. Night	6 10 5 50 2	52	4 42	27
C	4 S. in Lent. Mid-Lent S.	6 8 5 52 2	28	5 17	28
M		6 6 5 54 2	4	5 43	29
Iu		6 4 5 56 1	41	6 7	30
W	St. Patrick	6 2 5 58 1	17	6 24	1
Th		6 0 6 0 0	53	☽ sets	2
F		5 58 6 2 0	29	7 A 41	3
S	Cuthbert.	5 56 6 4 0	S 6	9 0	4
C	5 S. in Lent. Pass. Sun.	5 54 6 6 0	N 18	10 22	5
M	[Benedict]	5 52 6 8 0	42	11 44	6
Iu	Sirius So. 6h. 24m	5 50 6 10 1	5	Morn.	7
W		5 48 6 12 1	29	1 5	8
Th	Annun. V. M. Lady-Day	5 46 6 14 1	52	2 19	9
F	Camb. Term ends	5 44 6 16 2	16	3 19	10
S	Oxf. Term ends	5 42 6 18 2	39	4 7	11
C	6 S. Lent. Palm Sunday	5 41 6 19 3	3	4 42	12
M		5 39 6 21 3	26	5 7	13
Tu	Procyon South 6h. 55m	5 37 6 23 3	49	5 29	14
W		5 35 6 25 4	13	5 49	15

Days	L. of D.	Days inc.	D breaks Sun	East	Tw. ends	☽. bet. S.	Stars So.
I	10 51	3 7	4 41	5 36	7 19	12 40	4 A 44
6	11 11	3 27	4 31	5 42	7 29	11 33	4 26
I	11 30	3 46	4 21	5 48	7 39	11 16	4 8
6	11 50	4 6	4 10	5 54	7 50	8 51	3 49
I	12 10	4 26	3 59	6 1	8 1	7 22	3 31
6	12 30	4 46	3 47	6 7	8 13	5 49	3 13

Table with multiple columns and rows, containing faint text and numbers, possibly a ledger or account book. The text is illegible due to fading.

1850
 The following is a list of the names of the persons who have been admitted to the membership of the Society since the last meeting.

No.	Name	Age	Sex	Profession	Residence
1	John Smith	35	M	Teacher	123 Main St.
2	Mary Jones	28	F	Homemaker	456 Elm St.
3	James Brown	42	M	Farmer	789 Oak St.
4	Sarah White	30	F	Teacher	101 Pine St.
5	Robert Green	25	M	Student	202 Cedar St.
6	Elizabeth Black	40	F	Homemaker	303 Birch St.
7	William Gray	38	M	Merchant	404 Walnut St.
8	Ann Miller	22	F	Student	505 Spruce St.
9	George Taylor	50	M	Farmer	606 Maple St.
10	Rebecca Adams	33	F	Teacher	707 Poplar St.
11	Henry King	27	M	Student	808 Willow St.
12	Lucy Baker	37	F	Homemaker	909 Ash St.
13	Charles Hall	45	M	Merchant	1010 Hickory St.
14	Margaret Lee	29	F	Teacher	1111 Sycamore St.
15	Thomas Young	32	M	Farmer	1212 Chestnut St.
16	Anna Scott	24	F	Student	1313 Elm St.
17	John Wilson	48	M	Merchant	1414 Oak St.
18	Elizabeth Moore	36	F	Homemaker	1515 Pine St.
19	Samuel Taylor	21	M	Student	1616 Cedar St.
20	Mary Evans	41	F	Teacher	1717 Birch St.
21	George Clark	34	M	Farmer	1818 Walnut St.
22	Ann Walker	26	F	Student	1919 Spruce St.
23	Robert Lewis	43	M	Merchant	2020 Maple St.
24	Sarah Hall	31	F	Teacher	2121 Poplar St.
25	William King	23	M	Student	2222 Willow St.
26	Elizabeth Green	39	F	Homemaker	2323 Ash St.
27	Charles Adams	47	M	Merchant	2424 Hickory St.
28	Margaret Baker	28	F	Teacher	2525 Sycamore St.
29	Thomas Miller	35	M	Farmer	2626 Chestnut St.
30	Anna Young	25	F	Student	2727 Elm St.
31	John Scott	49	M	Merchant	2828 Oak St.
32	Elizabeth Moore	37	F	Homemaker	2929 Pine St.
33	Samuel Taylor	22	M	Student	3030 Cedar St.
34	Mary Evans	42	F	Teacher	3131 Birch St.
35	George Clark	33	M	Farmer	3232 Walnut St.
36	Ann Walker	27	F	Student	3333 Spruce St.
37	Robert Lewis	44	M	Merchant	3434 Maple St.
38	Sarah Hall	32	F	Teacher	3535 Poplar St.
39	William King	24	M	Student	3636 Willow St.
40	Elizabeth Green	38	F	Homemaker	3737 Ash St.
41	Charles Adams	46	M	Merchant	3838 Hickory St.
42	Margaret Baker	29	F	Teacher	3939 Sycamore St.
43	Thomas Miller	36	M	Farmer	4040 Chestnut St.
44	Anna Young	26	F	Student	4141 Elm St.
45	John Scott	50	M	Merchant	4242 Oak St.
46	Elizabeth Moore	38	F	Homemaker	4343 Pine St.
47	Samuel Taylor	23	M	Student	4444 Cedar St.
48	Mary Evans	43	F	Teacher	4545 Birch St.
49	George Clark	34	M	Farmer	4646 Walnut St.
50	Ann Walker	28	F	Student	4747 Spruce St.
51	Robert Lewis	45	M	Merchant	4848 Maple St.
52	Sarah Hall	33	F	Teacher	4949 Poplar St.
53	William King	25	M	Student	5050 Willow St.
54	Elizabeth Green	40	F	Homemaker	5151 Ash St.
55	Charles Adams	48	M	Merchant	5252 Hickory St.
56	Margaret Baker	30	F	Teacher	5353 Sycamore St.
57	Thomas Miller	37	M	Farmer	5454 Chestnut St.
58	Anna Young	27	F	Student	5555 Elm St.
59	John Scott	51	M	Merchant	5656 Oak St.
60	Elizabeth Moore	39	F	Homemaker	5757 Pine St.
61	Samuel Taylor	24	M	Student	5858 Cedar St.
62	Mary Evans	44	F	Teacher	5959 Birch St.
63	George Clark	35	M	Farmer	6060 Walnut St.
64	Ann Walker	29	F	Student	6161 Spruce St.
65	Robert Lewis	46	M	Merchant	6262 Maple St.
66	Sarah Hall	34	F	Teacher	6363 Poplar St.
67	William King	26	M	Student	6464 Willow St.
68	Elizabeth Green	41	F	Homemaker	6565 Ash St.
69	Charles Adams	49	M	Merchant	6666 Hickory St.
70	Margaret Baker	31	F	Teacher	6767 Sycamore St.
71	Thomas Miller	38	M	Farmer	6868 Chestnut St.
72	Anna Young	28	F	Student	6969 Elm St.
73	John Scott	52	M	Merchant	7070 Oak St.
74	Elizabeth Moore	40	F	Homemaker	7171 Pine St.
75	Samuel Taylor	25	M	Student	7272 Cedar St.
76	Mary Evans	45	F	Teacher	7373 Birch St.
77	George Clark	36	M	Farmer	7474 Walnut St.
78	Ann Walker	30	F	Student	7575 Spruce St.
79	Robert Lewis	47	M	Merchant	7676 Maple St.
80	Sarah Hall	35	F	Teacher	7777 Poplar St.
81	William King	27	M	Student	7878 Willow St.
82	Elizabeth Green	42	F	Homemaker	7979 Ash St.
83	Charles Adams	50	M	Merchant	8080 Hickory St.
84	Margaret Baker	32	F	Teacher	8181 Sycamore St.
85	Thomas Miller	39	M	Farmer	8282 Chestnut St.
86	Anna Young	29	F	Student	8383 Elm St.
87	John Scott	53	M	Merchant	8484 Oak St.
88	Elizabeth Moore	41	F	Homemaker	8585 Pine St.
89	Samuel Taylor	26	M	Student	8686 Cedar St.
90	Mary Evans	46	F	Teacher	8787 Birch St.
91	George Clark	37	M	Farmer	8888 Walnut St.
92	Ann Walker	31	F	Student	8989 Spruce St.
93	Robert Lewis	48	M	Merchant	9090 Maple St.
94	Sarah Hall	36	F	Teacher	9191 Poplar St.
95	William King	28	M	Student	9292 Willow St.
96	Elizabeth Green	43	F	Homemaker	9393 Ash St.
97	Charles Adams	51	M	Merchant	9494 Hickory St.
98	Margaret Baker	33	F	Teacher	9595 Sycamore St.
99	Thomas Miller	40	M	Farmer	9696 Chestnut St.
100	Anna Young	30	F	Student	9797 Elm St.

No.	Name	Age	Sex	Profession	Residence
101	John Smith	35	M	Teacher	123 Main St.
102	Mary Jones	28	F	Homemaker	456 Elm St.
103	James Brown	42	M	Farmer	789 Oak St.
104	Sarah White	30	F	Teacher	101 Pine St.
105	Robert Green	25	M	Student	202 Cedar St.
106	Elizabeth Black	40	F	Homemaker	303 Birch St.
107	William Gray	38	M	Merchant	404 Walnut St.
108	Ann Miller	22	F	Student	505 Spruce St.
109	George Taylor	50	M	Farmer	606 Maple St.
110	Rebecca Adams	33	F	Teacher	707 Poplar St.
111	Henry King	27	M	Student	808 Willow St.
112	Lucy Baker	37	F	Homemaker	909 Ash St.
113	Charles Hall	45	M	Merchant	1010 Hickory St.
114	Margaret Lee	29	F	Teacher	1111 Sycamore St.
115	Thomas Miller	35	M	Farmer	1212 Chestnut St.
116	Anna Young	25	F	Student	1313 Elm St.
117	John Scott	49	M	Merchant	1414 Oak St.
118	Elizabeth Moore	37	F	Homemaker	1515 Pine St.
119	Samuel Taylor	22	M	Student	1616 Cedar St.
120	Mary Evans	42	F	Teacher	1717 Birch St.
121	George Clark	33	M	Farmer	1818 Walnut St.
122	Ann Walker	27	F	Student	1919 Spruce St.
123	Robert Lewis	44	M	Merchant	2020 Maple St.
124	Sarah Hall	32	F	Teacher	2121 Poplar St.
125	William King	24	M	Student	2222 Willow St.
126	Elizabeth Green	39	F	Homemaker	2323 Ash St.
127	Charles Adams	47	M	Merchant	2424 Hickory St.
128	Margaret Baker	29	F	Teacher	2525 Sycamore St.
129	Thomas Miller	36	M	Farmer	2626 Chestnut St.
130	Anna Young	26	F	Student	2727 Elm St.
131	John Scott	50	M	Merchant	2828 Oak St.
132	Elizabeth Moore	38	F	Homemaker	2929 Pine St.
133	Samuel Taylor	23	M	Student	3030 Cedar St.
134	Mary Evans	43	F	Teacher	3131 Birch St.
135	George Clark	34	M	Farmer	3232 Walnut St.
136	Ann Walker	28	F	Student	3333 Spruce St.
137	Robert Lewis	45	M	Merchant	3434 Maple St.
138	Sarah Hall	33	F	Teacher	3535 Poplar St.
139	William King	25	M	Student	3636 Willow St.
140	Elizabeth Green	40	F	Homemaker	3737 Ash St.
141	Charles Adams	48	M	Merchant	3838 Hickory St.
142	Margaret Baker	30	F	Teacher	3939 Sycamore St.
143	Thomas Miller	37	M	Farmer	4040 Chestnut St.
144	Anna Young	27	F	Student	4141 Elm St.
145	John Scott	51	M	Merchant	4242 Oak St.
146	Elizabeth Moore	39	F	Homemaker	4343 Pine St.
147	Samuel Taylor	24	M	Student	4444 Cedar St.
148	Mary Evans	44	F	Teacher	4545 Birch St.
149	George Clark	35	M	Farmer	4646 Walnut St.
150	Ann Walker	29	F	Student	4747 Spruce St.

Full Moon	1 day 2 h. 1 m. morning	Sun enters Taurus. 2od. 6h. 42m. morn Apparent time.
Last Quarter	8 day 10 h. 52 m. afternoon	
New Moon	16 day 3 h. 16 m. afternoon	
First Quarter	23 day 10 h. 40 m. morning	
Full Moon	30 day 2 h. 51 m. afternoon	

1	Th	Maund. Thursday	5 33	6 27	4 36	D rises	16
2	F	Good Friday	5 31	6 29	4 59	8 A 20	17
3	S	R. Bishop Chichester	5 29	6 31	5 22	9 35	18
4	C	Easter Day. St. Ambrose	5 27	6 33	5 45	10 49	19
5	M	Easter Monday O. Lady-d.	5 25	6 35	6 8	11 59	20
6	Tu	Easter Tuesday	5 23	6 37	6 30	Morn.	21
7	W		5 21	6 39	6 53	1 6	22
8	Th	Regulus So. 8h. 47m	5 19	6 41	7 15	2 2	23
9	F		5 17	6 43	7 38	2 48	24
10	S		5 15	6 45	8 0	3 25	25
11	C	1 S. after Easter. Low S.	5 13	6 47	8 22	3 54	26
12	M		5 11	6 49	8 44	4 18	27
13	Tu		5 10	6 50	9 6	4 37	28
14	W	Oxf. and Camb. T. beg.	5 8	6 52	9 27	4 54	29
15	Th		5 6	6 54	9 49	5 10	30
16	F	Procyon So. 5h. 53m	5 4	6 56	10 10	D sets	1
17	S		5 2	6 58	10 31	8 A 12	2
18	C	2 S. after Easter. 1 Ret.	5 0	7 0	10 52	9 36	3
19	M	Aphege.	4 58	7 2	11 13	11 0	4
20	Tu		4 56	7 4	11 34	Morn.	5
21	W	Term begins	4 55	7 5	11 54	0 20	6
22	Th		4 53	7 7	12 14	1 24	7
23	F	St. George	4 51	7 9	12 34	2 16	8
24	S	Jupiter rises 8. 49 N.	4 50	7 10	12 54	2 52	9
25	C	3 S. aft. East. St. Mark.	4 48	7 12	13 14	3 21	10
26	M	[Prs. Mary born. 2 Ret]	4 46	7 14	13 33	3 44	11
27	Tu		4 44	7 16	13 52	4 2	12
28	W	Spica South 10h. 49m	4 42	7 18	14 11	4 19	13
29	Th		4 41	7 19	14 30	4 35	14
30	F		4 39	7 21	14 49	D rises	15

Days	h. or m.	Days inc.	D. breaks	Sun east	Tw. ends	Cl. bef. S	7 Stars Se
1	12 53	5 9	3 32	6 15	8 28	3 57	2 A 51
6	13 13	5 29	3 19	6 21	8 41	2 26	2 33
11	13 33	5 49	3 6	6 27	8 54	1 1	2 15
16	13 52	6 8	2 52	6 33	9 8	0 A 16	1 56
21	14 10	6 26	2 37	6 39	9 23	1 24	1 38
26	14 28	6 44	2 21	6 44	9 39	2 22	1 19

Last Quarter 8 day 5 h. 10 m. afternoon
New Moon 16 day 1 h. 6 m. morning. Sun enters Gemini.
 First Quarter 22 day 4 h. 36 m. afternoon 21 d. 7 h. 19 m. morn
Full Moon 30 day 4 h. 52 m. morning Apparent time.

1	S	St. Philip and James	4	37	7	23	15	7	8 A	40	16
2	C	4 S. after Easter. 3 Return	4	35	7	25	15	25	9	50	17
3	M	Inv. of Cross.	4	33	7	27	15	43	11	0	18
4	Tu	Regulus So. 7h. 10m	4	32	7	28	16	0	11	58	19
5	W		4	31	7	29	16	17	Morn.		20
6	Th	John ante P. Lat. Venus	4	29	7	31	16	34	0	49	21
7	F	[rises 3. 23. morn.	4	28	7	32	16	51	1	30	22
8	S		4	26	7	34	17	7	2	1	23
9	C	5 S. aft. Easter. Rog. S.	4	24	7	36	17	23	2	26	24
10	M	[4 Ret.	4	23	7	37	17	39	2	47	25
11	Tu		4	21	7	39	17	55	3	3	26
12	W	Old May-day.	4	20	7	40	18	10	3	20	27
13	Th	Ascens. day. Holy Thurs.	4	18	7	42	18	25	3	36	28
14	F	On mor. of Ascens. 5 Ret.	4	16	7	44	18	40	3	52	29
15	S	Mars rises 7. 15. night	4	15	7	45	18	54) sets		1
16	C	Sunday after Ascension	4	13	7	47	19	8	8 A	38	2
17	M	Easter Term ends	4	12	7	48	19	22	10	4	3
18	Tu	Spica So. 9h. 32m.	4	10	7	50	19	35	11	18	4
19	W	Q. Cha. b. 1744 Dunst.	4	9	7	51	19	48	Morn.		5
20	Th	Oxford Term ends	4	7	7	53	20	1	0	17	6
21	F		4	6	7	54	20	13	0	57	7
22	S	Prs. Elizabeth born	4	4	7	56	20	25	1	29	8
23	C	Whit-Sunday	4	3	7	57	20	36	1	53	9
24	M	Whit-Monday	4	2	7	58	20	48	2	12	10
25	Tu	Whit-Tuesday	4	0	8	0	20	59	2	29	11
26	W	Ember Week. Augustine	3	59	8	1	21	9	2	43	12
27	Th	Venerable Bede	3	58	8	2	21	20	2	59	13
28	F		3	57	8	3	21	29	3	16	14
29	S	K. Ch. II. Restored	3	56	8	4	21	39	3	33	15
30	C	Trin. Sun. Camb. T. di.	3	55	8	5	21	48) rises		16
31	M	Arctu. So. 9h. 32m. 1 Ret	3	54	8	6	21	57	9 A	48	17

Days	L. of D.	Days In.	D. breaks	Sun East	Tw ends	Cl. aft. S.	Stars So.
1	14 46	7 2	2 4	6 50	9 56	3 8	1 A 0
6	15 2	7 18	1 47	6 56	10 13	3 40	0 41
11	15 20	7 36	1 26	7 0	10 34	3 58	0 22
16	15 35	7 51	1 2	7 4	10 58	4 0	0 2
21	15 49	8 5	0 22	7 8	11 38	3 49	11 M 42
26	16 1	8 17	No Night	7 12	All Twil	3 25	11 22

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Last Quarter	7 day	8 h. 42 m.	morning	S. enters Cancer. 2 id. 4h. 3m. aft. Apparent time.
New Moon	14 day	9 h. 0 m.	morning	
First Quarter	20 day	11 h. 39 m.	afternoon	
Full Moon	28 day	7 h. 46 m.	afternoon	

1	Th	Nicomede	3 52	8 8	22 5	10 A 43	18
2	W	Oxf and Camb. T. begin	3 51	8 9	22 13	11 29	19
3	Th	<i>Serpus Christi.</i>	3 50	8 10	22 20	11 59	20
4	F	K. G. III. bo. 1738 T. beg	3 49	8 11	22 28	Morn.	21
5	S	Pr. Er. Aug. b. Boniface	3 48	8 12	22 34	0 28	22
6	C	1 S. aft. Trin. In 8 days	3 48	8 12	22 41	0 49	23
7	M	[Holy Trin. 2 Ret]	3 47	8 13	22 47	1 7	24
8	Th	Arcturus South 8h. 59m	3 47	8 13	22 52	1 23	25
9	W		3 46	8 14	22 58	1 37	26
10	Th	Prs. Amelia born	3 46	8 14	23 2	1 52	27
11	F	St. Barnabas	3 45	8 15	23 7	2 10	28
12	S		3 45	8 15	23 11	2 31	29
13	C	2 S. aft. Trinity 3 Ret.	3 44	8 16	23 14	D sets	1
14	M	☉ Eclipsed visible	3 44	8 16	23 17	8 A 51	2
15	Th		3 44	8 16	23 20	9 59	3
16	W		3 43	8 17	23 23	10 49	4
17	Th	St. Alban			23 25	11 26	5
18	F	Antares So. 10h. 27m			23 26	11 53	6
19	S				23 27	Morn.	7
20	C	3 S. aft. Tr. T. K. Edw.			23 27	0 13	8
21	M	Longest day [4 Ret.]			23 28	0 30	9
22	Th				23 28	0 46	10
23	W	Term ends			23 27	1 0	11
24	Th	St. John Bap Midsum day	3 43	8 17	23 26	1 16	12
25	F		3 44	8 16	23 25	1 34	13
26	S		3 44	8 16	23 23	1 57	14
27	C	4 S. aft. Trinity	3 44	8 16	23 21	2 23	15
28	M	Lyra So. 11h. 59m	3 44	8 16	23 18	D rises	16
29	Th	St. Peter & Paul	3 45	8 15	23 15	9 A 22	17
30	W	Buck hunting comes in	3 45	8 15	23 12	9 57	18

Days	U. of D.	Days inc.	D. breaks	Sun East	Tw. ends	Cl. aft. S.	7 Stars So.
1	16 14	8 30	No real night, but constant twilight.	7 15	No real night, but constant twilight.	2 40	10 M 58
6	16 23	8 39		7 18		1 52	10 38
11	16 29	8 45		7 20		0 55	10 17
16	16 32	8 48		7 21		0 48	9 57
21	16 34	8 50		7 21		1 13	9 36
26	16 33	dec. 1		7 20		2 16	9 15

Last Quarter	9 day	9 h.	16 m.	aftern.	
New Moon	13 day	3 h.	55 m.	aftern.	Sun enters Leo.
First Quarter	20 day	9 h.	8 m.	morning	23d. 2h. 53m. mo.
Full Moon	28 day	11 h.	0 m.	morning	Apparent time.

1	Th	Antares So. 9h. 34m	3	46	8	14	23	8	10	A	27	19
2	F	Visit. B. V. Mary	3	46	8	14	23	4	10		50	20
3	S	Dies Comit or.	3	47	8	13	22	59	11		8	21
4	C	5 S. aft. Trin. Tr. St M	3	47	8	13	22	54	11		23	22
5	M		3	48	8	12	22	4	11		37	23
6	Tu	Camb. Commencement	3	49	8	11	22	43	11		53	24
7	W	Tho. Bucket.	3	50	8	10	22	37		Morn.		25
8	Th		3	50	8	10	22	30	0		28	26
9	F	Camb. Term ends	3	51	8	9	22	23	0		48	27
10	S		3	52	8	8	22	16	1		20	28
11	C	6 S. aft. Trinity.	3	53	8	7	22	8	2		3	29
12	M	Oxford Act	3	54	8	6	22	0	3		5	30
13	Tu		3	55	8	5	21	51		D sets		1
14	W		3	56	8	4	21	42	9	A	17	2
15	Th	St. Swithin	3	57	8	3	21	33	9		49	3
16	F	Jupiter sets 10h. 17m. N	3	58	8	2	21	23	10		12	4
17	S	Oxford Term ends	3	59	8	1	21	13	10		31	5
18	C	7 S. aft. Trinity	4	0	8	0	21	3	10		47	6
19	M		4	1	7	59	20	52	11		3	7
20	Tu	Margaret V. and M.	4	2	7	58	20	41	11		18	8
21	W		4	3	7	57	20	30	11		36	9
22	Th	St. Mary Magdalen	4	5	7	5	20	18	11		58	10
23	F		4	6	7	54	20	6		Morn.		11
24	S	Antares So. 8h. 1m	4	7	7	53	19	53	0		23	12
25	C	8 S. aft. Trin. St. James	4	9	7	51	19	41	0		56	13
26	M	St. Ann.	4	10	7	50	19	28	1		40	14
27	Tu		4	12	7	48	19	14	2		32	15
28	W		4	13	7	47	19	0		D rises		16
29	Th		4	15	7	45	18	46	8	A	51	17
30	F		4	16	7	44	18	32	9		11	18
31	S	Aquila So 10h 56m	4	17	7	43	18	17	9		26	19

Days	L. of D	Days. de.	D. breaks	Sun. set.	W. ends	D. bet. S.	Sta. S. So
1	16 29	0 5		7 20		3 16	8 M 54
6	16 23	0 11	No real	7 18	No real	4 11	8 34
11	16 15	0 19	Night.	7 15	Night.	4 57	8 13
16	16 5	0 29		7 13		5 32	7 53
21	15 53	0 41		7 9		5 55	7 33
26	15 40	0 54	0 58	7 5	11 2	6 2	7 13

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Chapter XXXI	310
Chapter XXXII	320
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Chapter XXXVII	370
Chapter XXXVIII	380
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Chapter XLI	410
Chapter XLII	420
Chapter XLIII	430
Chapter XLIV	440
Chapter XLV	450
Chapter XLVI	460
Chapter XLVII	470
Chapter XLVIII	480
Chapter XLIX	490
Chapter L	500

Account of the ...

Date	Particulars	Debit	Credit
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Last Quarter 5 day 7 h. 29 m. morning
New Moon 11 day 10 h. 51 m. afternoon Sun enters Virgo.
 First Quarter 18 day 10 h. 0 m. afternoon 23d. 9h. 13m. mo.
Full Moon 27 day 2 h. 5 m. morning Apparent time.

1	C	9 S. aft. Trin.	Lam. day	4	18	7	42	18	2	9	A	4	1	20
2	M	Lyra So.	9h. 38.	4	20	7	40	17	47	9		57		21
3	Tu			4	21	7	39	17	31	10		12		22
4	W			4	23	7	37	17	16	10		28		23
5	Th			4	24	7	36	16	59	10		50		24
6	F	Transfiguration		4	26	7	34	16	43	11		16		25
7	S	Name of Jesus		4	27	7	33	16	26	11		52		26
8	C	10 S. aft. Trinity		4	29	7	31	16	9		Morn.			27
9	M			4	31	7	29	15	52	0		42		28
10	Tu	St. Lawrence		4	33	7	27	15	35	1		52		29
11	W	Prs. Brunf. born 1737		4	34	7	26	15	17		D	fets		1
12	Th	Pr. of Wales bo. 1762		4	36	7	24	14	59	8	A	15		2
13	F			4	38	7	22	14	41	8		35		3
14	S	Aquila So. 10h. 3m		4	39	7	21	14	22	8		53		4
15	C	11 S. aft. Trin. Aff. V. M		4	41	7	19	14	4	9		9		5
16	M	Pr. Fred. born 1763		4	43	7	17	13	45	9		25		6
17	Tu			4	45	7	15	13	26	9		41		7
18	W			4	46	7	14	13	6	10		3		8
19	Th			4	48	7	12	12	47	10		28		9
20	F	[Athanasius]		4	50	7	10	12	27	10		58		10
21	S	Pr. Wm. Hen. bo. 1765		4	52	7	8	12	7	11		37		11
22	C	12 Sund. aft. Trinity		4	54	7	6	11	47		Morn.			12
23	M			4	56	7	4	11	27	0		26		13
24	Tu	St. Bartholomew		4	58	7	2	11	6	1		27		14
25	W	Saturn fets 9h. 38m. N		5	0	7	0	11	46	2		31		15
26	Th	Aquila So. 9h. 19m.		5	16	59	10	25	3	4		41		16
27	F			5	36	57	10	4			D	rises		17
28	S	St. Augustin		5	56	55	9	43	7	8		54		18
29	C	13 S. aft. Trin. St. John		5	76	53	9	21	8	11		19		19
30	M	[Bapt. beb.]		5	96	51	9	0	8	24		20		20
31	Tu	Clock with Sun		5	116	49	8	38	8	40		21		21

Days	L. of D.	Days dec.	D. breaks	Sun East	Tw. ends	Cl. ber. S.	7 Stars So.
1	15	21	1 13	1 27	7 0	10 33	5 52
6	15	6	1 28	1 47	6 55	10 13	5 28
11	14	49	1 45	2 5	6 50	9 55	4 49
16	14	31	2 3	2 22	6 45	9 38	3 56
21	14	13	2 21	2 37	6 39	9 23	2 50
26	13	54	2 40	2 52	6 34	9 8	1 32

1779.

September hath XXX Days.

11

Last Quarter 3 day 3 h. 49 m. afternoon
New Moon 10 day 6 h. 56 m. morning Sun enters Libra.
 First Quarter 17 day 2 h. 30 m. morning 23d. 5h. 35m. mo.
Full Moon 25 day 4 h. 51 m. afternoon Apparent time.

1	W	<i>Giles</i>	5	13	6	47	8	17	8 A	59	22
2	Tu	London burnt 1666 O S	5	15	6	45	7	55	9	22	23
3	F	Aquilæ So. 8h. 50m	5	16	6	44	7	33	9	52	24
4	S		5	18	6	42	7	10	10	39	25
5	C	14 S. aft. Trinity	5	20	6	40	6	48	11	36	26
6	M		5	22	6	38	6	26	Morn.		27
7	Tu	Eunurchus.	5	24	6	36	6	3	0	53	28
8	W	<i>Nativity V. Mary</i>	5	26	6	34	5	41	2	17	29
9	Th		5	28	6	32	5	18	3	48	1
10	F		5	30	6	30	4	55	D	fets	2
11	S	Fomalhaut South 11 26	5	32	6	28	4	32	7 A	20	3
12	C	15 S. aft. Trinity	5	34	6	26	4	10	7	36	4
13	M		5	36	6	24	3	47	7	53	5
14	Tu	Holy Cross	5	38	6	22	3	23	8	12	6
15	W	Ember Week	5	40	6	20	3	0	8	35	7
16	Th		5	42	6	18	2	37	9	5	8
17	F	<i>Lambert</i>	5	44	6	16	2	14	9	42	9
18	S		5	46	6	14	1	51	10	26	10
19	C	16 S. aft. Trinity	5	48	6	12	1	27	11	22	11
20	M	Saturn sets 7. 51. night	5	50	6	10	1	4	Morn.		12
21	Tu	St. Matthew	5	52	6	8	0	41	0	28	13
22	W	K. Geo. III. Cor. 1761.	5	54	6	6	0	17n	1	37	14
23	Th	Equal Day & Night	5	56	6	4	0	63	2	49	15
24	F		5	58	6	2	0	30	4	3	16
25	S	Fomalhaut So. 10h. 35m	6	0	6	0	0	53	D	rises	17
26	C	17 S. aft. Trin. St. Cypr.	6	2	5	58	1	17	6 A	40	18
27	M		6	4	5	56	1	40	6	54	19
28	Tu		6	6	5	54	2	3	7	13	20
29	W	St. Mich. Prs. Char. A. b.	6	8	5	52	2	27	7	35	21
30	Th	St. Jerome	6	10	5	50	2	50	8	4	22

Days	L. of D.	Days dec.	D. breaks	Sun East	Tw. ends	Cl. aft. S.	7 Stars So.
1	13 32	3 2	3 9	6 27	8 51	0 14	4 M 54
6	13 12	3 22	3 22	6 21	8 38	1 51	4 36
11	12 53	3 41	3 34	6 15	8 26	3 32	4 18
16	12 33	4 1	3 46	6 9	8 14	5 16	4 0
21	12 14	4 20	3 59	6 2	8 1	7 1	3 42
26	11 54	4 40	4 9	5 56	7 51	8 44	3 24

Date		Description		Amount	
1790	Jan 1	To Balance		100	
	Feb 1	By Cash	50		
	Mar 1	To Cash	20		
	Apr 1	By Cash	30		
	May 1	To Cash	40		
	Jun 1	By Cash	50		
	Jul 1	To Cash	60		
	Aug 1	By Cash	70		
	Sep 1	To Cash	80		
	Oct 1	By Cash	90		
	Nov 1	To Cash	100		
	Dec 1	By Cash	110		
	Total			1000	

THE HISTORY OF THE

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A table with multiple columns and rows, containing faint text that is mostly illegible. It appears to be a list or a ledger of some kind.

Last Quarter 2 day 10 h. 59 m. afternoon
New Moon 9 day 5 h. 13 m. afternoon Sun enters Scorpio.
 First Quarter 17 day 9 h. 52 m. morning 23 d. 1 h. 26 m. aft.
Full Moon 25 day 6 h. 52 m. morning Apparent time.

1	F	<i>Remigius</i>	6	11	5	49	3	14	S	8A	42	23
2	S	Mars sets 8h 57m. N.	6	13	5	47	3	37		9	36	24
3	C	18 S. aft. Trinity	6	15	5	45	4	0		10	41	25
4	M		6	17	5	43	4	23		Morn.		26
5	F	Fomalhaut South 9 59	6	19	5	41	4	47		0	2	27
6	W	<i>Faith</i>	6	21	5	39	5	10		1	33	28
7	Th		6	23	5	37	5	33		2	57	29
8	F		6	25	5	35	5	56		4	22	30
9	S	<i>St. Denys</i>	6	27	5	33	6	19		5	sets	1
10	C	19 S. aft. Tr. O. Mich. d	6	29	5	31	6	42		6	6	2
11	M	Oxf.&Cam. Terms begin	6	31	5	29	7	4		6	23	3
12	Tu		6	33	5	27	7	27		6	44	4
13	W	<i>Tr. K. Ed. Confessor</i>	6	35	5	25	7	49		7	9	5
14	Th		6	37	5	23	8	12		7	45	6
15	F	Fomalhaut So. 9h 23m	6	39	5	21	8	34		8	27	7
16	S	Jupiter rises 5. 28. morn	6	41	5	19	8	56		9	18	8
17	C	20 S. aft. Trin. Ethelred	6	43	5	17	9	19		10	20	9
18	M	<i>St. Luke</i>	6	45	5	15	9	40		11	25	10
19	Tu		6	47	5	13	10	2		Morn.		11
20	W		6	49	5	11	10	24		0	38	12
21	Th		6	51	5	9	10	45		1	51	13
22	F	Saturn sets 6. 20. Night	6	53	5	7	11	7		3	4	14
23	S		6	55	5	5	11	28		4	28	15
24	C	21 S. aft. Tria.	6	57	5	3	11	49		5	32	16
25	M	<i>K. Geo. III Access. Crispin</i>	6	59	5	1	12	10		5	rises	17
26	Tu	<i>K. Geo. III Decl 1763</i>	7	1	4	59	12	30		5A	44	18
27	W		7	3	4	57	12	51		6	8	19
28	Th	St. Simon and Jude	7	5	4	55	13	11		6	46	20
29	F		7	6	4	53	13	31		7	32	21
30	S		7	8	4	51	13	51		8	38	22
31	C	22 S. aft. Trinity	7	10	4	50	14	10		9	54	23

Days	h.	m.	Days de.	h.	m.	Days de.	h.	m.	Days de.	h.	m.	Days de.	h.	m.
1	11	36	4	58	4	20	5	50	7	40	10	22	3	M 6
6	11	15	5	19	4	30	5	43	7	30	11	52	2	48
11	10	55	5	39	4	40	5	37	7	20	13	12	2	29
16	10	36	5	58	4	50	5	31	7	10	14	20	2	11
21	10	17	6	17	4	59	5	25	7	1	15	15	1	53
26	9	58	6	36	5	7	5	19	6	53	15	52	1	33

1779.

November hath XXX Days.

13

Last Quarter 1 day 5 h. 47 m. morning
 New Moon 8 day 6 h. 24 m. morning
 First Quarter 16 day 6 h. 35 m. morning
 Full Moon 23 day 7 h. 57 m. afternoon
 Last Quarter 30 day 1 h. 16 m. afternoon

S. ent. Sagittarius
 22d. 9h. 35m. mo.
 Apparent time.

1	M	All Saints	7	11	4	49	14	30	11	A 17	24
2	Tu	Pr. Ed. bo. 1767 All Souls	7	13	4	47	14	49	morn.		25
3	W	Mor. of all Souls 1 Ret	7	15	4	45	15	8	0	44	26
4	Th	Mars sets 8. 53. night	7	17	4	43	15	26	2	7	27
5	F	Powder P'ot 1605. O. S.	7	19	4	41	15	45	3	29	28
6	S	Mich Ter beg Leonard.	7	20	4	40	16	3	4	48	29
7	C	23 S. aft. Tr D Cumb. b.	7	22	4	38	16	21	6	7	1
8	M	Prs. Aug Sophia born	7	23	4	37	16	38	D	fets	2
9	Tu	Ld. Mayor's day	7	25	4	35	16	56	5	A 10	3
10	W		7	27	4	33	17	13	5	41	4
11	Th	St. Martin	7	29	4	31	17	29	6	20	5
12	F	Mor. of St. Mart. 2 Ret	7	30	4	30	17	46	7	8	6
13	S	Britius. [Cam. T. di.	7	31	4	29	18	2	8	6	7
14	C	24 S. aft. Trin.	7	33	4	27	18	18	9	13	8
15	M	Machutus	7	35	4	25	18	33	10	19	9
16	Th		7	36	4	24	18	48	11	30	10
17	W	Hugh B. Lincol'n	7	37	4	23	19	3	morn.		11
18	Th	In 8 days of St. Mar. 3 Ret.	7	39	4	21	19	18	0	42	12
19	F	Fomalhaut So 7h. 5m	7	41	4	19	19	32	1	53	13
20	S	Edm. K. and Mart.	7	43	4	17	19	45	3	8	14
21	C	25 S. aft. Trin.	7	44	4	16	19	59	4	23	15
22	M	Cecilia. Old Mart. day	7	45	4	15	20	12	5	44	16
23	Th	St. Clement	7	47	4	13	20	24	D	rises	17
24	W		7	48	4	12	20	37	4	A 37	18
25	Th	D. of Glo. bo. 1743. Cath	7	50	4	10	20	49	5	23	19
26	F	[in 15d of S. Mart. 4 Ret	7	51	4	9	21	0	6	22	20
27	S		7	52	4	8	21	11	7	37	21
28	C	Advent Sunday	7	53	4	7	21	22	9	1	22
29	M	Michaelm. Term ends	7	54	4	6	21	32	10	25	23
30	Th	St. Andrew	7	55	4	5	21	42	11	47	24

Day	Mo.	Day	Mo.	Day	Mo.	Day	Mo.	Day	Mo.	Day	Mo.	Day	Mo.
1	9	30	6	58	5	17	5	12	6	4	16	14	1 M 10
6	9	18	7	16	5	25	5	7	6	35	16	8	0 49
11	9	1	7	33	5	32	5	2	6	28	15	44	0 31
16	8	45	7	49	5	38	4	57	6	22	14	55	0 10
21	8	31	8	3	5	44	4	52	6	16	13	48	11 A 45
26	8	15	8	16	5	40	4	50	6	11	12	21	11 24

Date	Description	Debit	Credit	Balance
1790	Jan 1			
	Feb 1			
	Mar 1			
	Apr 1			
	May 1			
	Jun 1			
	Jul 1			
	Aug 1			
	Sep 1			
	Oct 1			
	Nov 1			
	Dec 1			
	Total			

Account of the ...

Date	Particulars	Debit	Credit	Balance
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New Moon 7 day 10 h. 31 m. aftern.
First Quarter 16 day 2 h. 54 m. morn.
Full Moon 23 day 7 h. 52 m. morn.
Last Quarter 29 day 10 h. 37 m. aftern.

S. ent. Capricorn 21d. 9h. 57m. aft
 Apparent time.

1	W	Fromalhaut So. 6h. 14m.	7	57	4	3	21	52	Morn.	25
2	Th		7	58	4	2	22	1	1	10
3	F		7	59	4	1	22	9	2	29
4	S	Barbara	8	0	4	0	22	17	3	46
5	C	2 S. in Advent	8	1	3	59	22	25	5	3
6	M	Nicholas	8	2	3	58	22	33	6	19
7	Tu		8	3	3	57	22	40	7	35
8	W	Conception Virgin Mary	8	3	3	57	22	46	7	sets
9	Th		8	4	3	56	22	52	4	A49
10	F	Aldebaran So 11h. 12m.	8	5	3	55	22	58	5	46
11	S		8	5	3	55	23	3	6	48
12	C	3 S. in Advent	8	6	3	54	23	7	7	56
13	M	Lucy	8	6	3	54	23	11	9	5
14	Tu		8	7	3	53	23	15	10	15
15	W	Ember Week	8	7	3	53	23	18	11	24
16	Th	O. Sap. Term ends.	8	7	3	53	23	21	morn.	10
17	F	Oxford Term ends	8	8	3	52	23	24	0	36
18	S		8				23	25	1	47
19	C	4 S. in Advent					23	27	3	4
20	M						23	27	4	24
21	Tu	St. Thomas. Shortest day					23	28	5	46
22	W						23	28	7	10
23	Th						23	28	7	rises
24	F	Aldebaran So. 10h. 10m					23	27	5	A 2
25	S	Christmas Day	8	8	3	52	23	25	6	26
26	C	1 S. after Christ. St. Step.	8	7	3	53	23	23	7	53
27	M	St. John	8	7	3	53	23	21	9	21
28	Tu	Innocents	8	7	3	53	23	18	10	45
29	W		8	6	3	54	23	15	morn.	23
30	Th		8	6	3	54	23	11	0	5
31	F	Silvester	8	6	3	54	23	7	1	21

Days.	L. of D.	Day dec.	D. breaks	Sun East.	Ev. ends	Cl. aft. S.	7 Stars	Sc
1	8	6	8 28	5 53	4 46	6 7	10 35	11 A 2
6	7	57	8 37	5 57	4 43	6 3	8 33	10 41
11	7	50	8 44	5 59	4 41	6 1	6 18	10 19
16	7	46	8 48	6 0	4 40	6 0	3 54	9 56
21	7	45	8 49	6 1	4 39	5 59	1 25	9 34
26	7	46	Incr. 1	6 1	4 40	5 59	1 be 4	9 13

Shortest day at Lond. is 7h. 45m.

A Table of TERMS and RETURNS.

HILARY Term begins Jan. 23—ends Feb. 12.

Returns or i. f. f. Days.	Exc.	Ret.	Ap.	W. D.
In 8 Days of St. Hilary - Jan. 20	21	22	23	Saturd
In Fifteen Days of St. Hilary - 27	28	29	30	Saturd
The Morrow of the Purification Feb. 3	4	5	6	Saturd
In Eight Days of the Purification 9	10	11	12	Friday

EASTER Term begins April 21—ends May 17.

From Easter-day to 15 Days, April 18	19	20	21	Wedn
From Easter-day in Three Weeks 25	26	27	28	Wedn
From Easter-day in 1 Month, May 2	3	4	5	Wedn
From Easter-day in Five Weeks 9	10	11	12	Wedn
On the Morrow of the Ascension 14	15	16	17	Mond

TRINITY Term begins June 4—ends June 23.

The Mor. of the Holy Trinity, May 3	4	5	6	Friday
In 8 Days of the Holy Trin. June 6	7	8	9	Wedn
In 15 Days of the Holy Trinity 13	14	15	16	Wedn
In 3 Weeks of the Holy Trinity 20	21	22	23	Wedn

MICHAELMAS Term begins Nov. 6—ends Nov. 29.

On the Morrow of all Souls, Nov. 3	4	5	6	Saturd
On the Morrow of St. Martin - 12	13	14	15	Mond
In Eight Days of St. Martin - 18	19	20	22	Mond
In Fifteen Days of St. Martin 25	26	27	29	Mond

Note, That the First and Last Days of every Term are the Days of Appearance.—No Sittings in Westminster-Hall on the 2d of February, Ascension and Midsummer Days.

Oxford Terms.

Lent Term — begins Jan. 14, ends March 27.
 Easter Term begins April 14, ends May 20.
 Trinity Term begins June 2, ends July 17.
 Michaelmas Term begins Oct. 11, ends Dec. 17.
 The Act will be July 12.

Cambridge Terms.

Lent Term — begins Jan. 13, ends March 26.
 Easter Term begins April 14, ends July 9.
 Michaelmas Term begins Oct. 11, ends Dec. 16.
 The Commencement will be July 6.

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THE HISTORY OF THE
CITY OF BOSTON
FROM THE FIRST SETTLEMENT
IN 1630 TO THE PRESENT
BY
NATHANIEL BENTLEY
VOLUME I
CONTAINING THE PERIOD FROM 1630 TO 1700
PUBLISHED BY
J. B. BENTLEY
NEW-YORK
1857

HOLIDAYS kept at the EXCHEQUER, BANK, STAMP OFFICE, EXCISE OFFICE, CUSTOM HOUSE, EAST INDIA and SOUTH SEA HOUSES in 1779; viz.

January 1, 6 not at S. Sea House, 18, 25, 30	September 2 not Cust. H. 14 not at Bank, Cust. H. S. Sea H. or Stamp O. 21, 22, 29
February 2, 16, 17, 24	October 18, 25 not at Cust. H. 26 not Cust. H. Stamp. O. or Excise O. 28 not C. H.
March 1 not at Bank, Cust. House, Stamp Office, 25	Novemb. 1, 2 not at Cust. H. Bank, Stamp O. or S. S. H. 4, 5, 9 not at Ex. 17 not C. H. Bank, or S. Sea H. 25 not at Custom H. Bank. Excheq. or Excise-O. 30
April 2, 5, 6, 7 not C. Houf. 23	December 21, 25, 27, 28.
May 1, 13, 24, 25, 26, 29	
June 4, 10 not Bank, Cust. H. Excheq. 11, 24, 29	
July 15 not at Stamp-Office, Bank, Cust. or S. Sea H.	
August 11 not Cust. H. Bank or S. Sea H. 12, 24.	

TRANSFER DAYS

At the BANK.

Stock, Tuesday, Thursday, and Friday
 3 per cent. reduc. Tues. Wed. Th. and Fri.
 4 per cent. conf. Ann. Mon. Wed. and Fri.
 4 per cent. new, Tuesday and Thursday
 Short annuities 1777, Wed. and Saturday
 3 -half per cent. 1758, Mon. Wed. and Fri.
 3 per cent. conf. Tu. Wed. Th. and Fri.
 3 per cent. 1756, Tuesday and Thursday
 Short Annuities 1778, Tues. and Thurs.
 Long Annuities, Wednesday and Saturday

At the SOUTH SEA HOUSE.

Stock, Monday, Wednesday, and Friday
 3 per cent. New Ann. Tues. Thurs. and Sat.
 3 per cent. 1751, Tuesday and Thursday
 3 per cent. Old Ann. Mon. Wed. and Fri. Ap. 5. Oct. 10.

EAST INDIA HOUSE.

Stock, Tuesday, Thursday and Saturday, Jan. 5, July 5.
 3 per cent. conf. Ann. Mon. Wed. and Fri. Apr. 10, Oct. 10.
 Dividends paid at the Bank from 9 to 11, and from 1 to 3
 Transfers — — from 11 to 1.
 Dividends at the South Sea and India Houses from 9 to 12.
 Transfers — — from 12 to 1.
 Interest on India Bonds due, March 31, September 30.

DIVIDENDS.

due,

} April 5
 } October 10
 }
 } Jan. 5
 } July 5
 }

A COMPANION TO

The LADIES and GENTLEMENS

D I A R Y,

FOR THE YEAR 1779 :

CONTAINING

ÆNIGMAS, REBUSSES,

MATHEMATICAL ESSAYS,

QUESTIONS AND SOLUTIONS, &c.

By REUBEN BURROW,

Late Assistant Astronomer at the Royal Observatory;
and Mathematical Master of the Drawing-Room in
the Tower.

L O N D O N,

Printed for T. CARNAN, in St. Paul's Church-Yard.

ANSWERS to the QUERIES, REBUSSES, &c. in Last Year's
DIARY.*Query I. Answered by Mr. Dalby.*

THE *cal* of the leg seems to have had its name from two *cimbria* words, *cal*, stout (or large, with respect to the other parts of the leg) and *lef*, always bent, or of a bended form [*vid. Goropius Becanus*] and from thence the Dutch name *kalf*, from this the English is evidently borrowed.

Query II. Answered by Miss Greville.

When a piece of iron is heated red hot and cooled in the open air its bulk becomes greater, or, it occupies more space, and therefore the particles composing it are at a greater distance from each other than before, and consequently the whole is less compact and softer; but the contrary happens if cooled in water; for, in heating, a great part of the air it contained is excluded by that operation on account of its expansion and rarefaction; then suddenly plunging it in water, the air is thereby prevented from insinuating itself into the metal while it cools, and so the particles, having more room, fall nearer together, which evidently must render it of a firmer texture.

Query III. Answered by Dr. Slop.

As Cotton only meant by the words in question to give a burlesque representation of the violence of the storm; his intention was evidently to compare its effects on the world with those of wine on the head of a drunkard; and as the famous Barnaby Harrington was not long before Cotton's time, so remarkable for his drunkenness and his poetry, he is doubtless the person alluded to; and therefore to *dance Barnaby*, is only another expression for *reeling*.

Query IV. Answered by Miss Polly Lee.

Problems in plane geometry can be drawn more exact with great distances than with small, because all points and lines in *practice* are of some breadth, and such breadths will hold a less proportion with great than with small distances, and consequently the errors in drawing will be less in using long lines than short ones: To explain this, suppose the circumference of a circle whose diameter is one-tenth of an inch, is to be divided into 1536 equal parts by lines drawn from the centre, this we will suppose to be done by a continual bisection of the chords, now when we come to the last divisions, we shall find that the lines which are to divide the chords, will be as broad as the chords are long, though perhaps the instrument may be as fine as possible; but this would not be the case if the diameter was two or three yards.

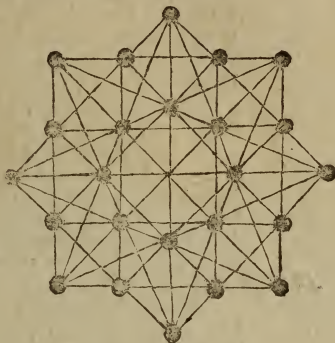
Query V. Answered by Caput Mortuum.

Whence the salt of the sea proceeds is a curious but difficult problem. According to some Naturalists it is owing to the mines of *Sal Gem* in the bowels of the earth washed down by the rains;-- admitting this, the Sea must grow continually saltier, because the water raised by evaporation

poration is fresh. On this supposition Dr. *Halley* proposed a theory to determine how long the world has subsisted; but as observations have not been made of the degree of its saltness at distant periods of time, it must be left to the determination of the curious in future ages.

Answer to the Paradox, by Mr. John Wales.

Behold, honest *David*, your
leeks I have planted
In twenty-eight rows, and
exact as you wanted;
In the margin pray view
them, nor take them
on trust,
You may count all the rows,
for the number is just.



In this manner it was Answered by Mr. Silcock, and many others.

REBUS II. *Answered by Mr. John Clarke of Lincoln.*

Dalby, we know thou canst with ease write well,
But joke no more about that place call'd *Hell*.

Answer to the ACROSTIC REBUS, by James Twitcher.

Perfidious France and haughty Spain
Arc at their dirty tricks again;---
Had but King George advis'd with *Chatham*,
The British Lion had been at 'em.

All the REBUSSES answered by Mr. John Wales.

I find 'tis fam'd <i>Newton</i> Miss Lee strives to hide,	I.
And <i>Hell</i> is the place where the wicked reside,	II.
Miss <i>Greville</i> to nobody seems to be join'd,	III.
But <i>Beatrice</i> the fair is in marriage combin'd,	IV.
Great <i>Milton</i> and <i>Chatham</i> then bring up the rear;	V. VI.
So I hope all the Rebuffes I've made appear.	

ANSWERS to the ENIGMAS in last Year's DIARY.

- | | |
|-------------------------|------------------------------|
| I. <i>A maidenhead</i> | VII. <i>A key</i> |
| II. <i>Nothing</i> | VIII. <i>A bum or deceit</i> |
| III. <i>A mousetrap</i> | IX. <i>Patience</i> |
| IV. <i>Tobacco</i> | X. <i>Nonsense</i> |
| V. <i>Charity</i> | Prize. <i>A kiss.</i> |
| VI. <i>Yourself</i> | |

The Prize Enigma answered by Mr. Joseph James.

Let poets talk of that or this,
L. Walker well describes a *kiss*.

The same answered by Cymon.

As Chloe was sleeping, Hodge view'd the dear maid
With a rapt'rous eye, and exultingly said ;
I'll snatch a sweet *kiss*, ere she opens her eyes,
And claim both the *gloves* and the Diary Prize !

The same answered by Milito of Tbingdon.

Friend Walker, a *kiss* is sure highest bliss
To each true and lovely sweet pair,
But oft the fair maid by kissing's betray'd,
And artfully drawn in a snare.

The same answered by Silvia.

Indeed, my friend *Walker*, you're perfectly right
In saying that *kissing* affords great delight,
A most pleasing sensation fills every vein
In receiving *salutes* from a favorite swain.

All the Rebusses and Enigmas answered by Miss Eliz. Cockbill, of Mansfield Woodhouse, in Nottinghamshire.

My maidenhead's my hope, my pride,	I. IX.
I've beauty's mousetrap on my side ;	III.
The flatterer's key-like <i>kiss</i> I'll shun,	VII. Prize.
And from the <i>smoking</i> sot I'll run ;	IV.
Of prating fops I'll take no heed,	
Their <i>nonsense</i> nothing can exceed ;	X. II.
Nor shall deceit my actions stain ;	VIII.
Nor <i>self</i> conceit over me reign ;	VI.
But I'll be jovial, gay and free,	
And live with all in <i>charity</i> ;	V.
But, if my lucky stars design	
That I in <i>marriage</i> knot shall join,	IV. Reb.
Then may my comfort be as rare	
As <i>Milton</i> or great <i>Newton</i> were.	V. I. Reb.
With him then I'll to <i>Chatham</i> sail,	VI. Reb.
And there steer thro' life's chequer'd vale,	
I'll fear <i>Nobody's</i> envious spell,	III. Reb.
Nor all the ferene wights of <i>Hell</i> ;	II. Reb.
But to my love I will prove true	
"Till Death commands to bid adieu.	

General Answer to the Enigmas, by Mr. Leonard Walker.

Accept, my dear Lucy, advice from a friend,
And adhere to the rules which I now recommend :
Tho' *Strephon* adores you, be careful of this,
To repulse his bold freedoms nor grant him a *kiss*, Prize.
Such freedoms admitted will lead him to more,
Till he gains the *last favor* and makes you a w---e! I.

Let

Answers to Queries, Rebusses, &c. 21

Let *nothing* persuade you, not love, praise, or self, II.
 To forget for a moment what's due to *yourself*. VI.
 Let *meekness* and *charity* guide you thro' life, V. IX.
 They're the *keys* of true knowledge for maid or for wife; VII.
 And will lead you the *nonsense* of fops to despise, X.
 And to laugh at the pert and affectedly wise;
 No *deceit* ever use to *entrap* the unwary, VIII. III.
 'Twill end but in *fumes* and surely miscarry. IV.
 This advice, my dear Lucy, is homely and plain;
 Yet I think it can do you no harm in the main.

General Answer to all the Enigmas, by Mr. John Clarke of Lincoln.

As lately I my annual journey went,
 At *Maidenhead* a pleasant evening spent : I.
Nothing was wanting to increase our mirth, II.
 And drinking deep gave noise and *nonsense* birth; X.
 Snug as are mice within their *wiry-houses*, III.
 We drank remembrance to our absent spouses;
 Smok'd *Trinidado* whilst we drank our nappy, IV.
 Sung glees and catches and were vastly happy.
 No narrow-minded wretch disgrac'd our board,
 Nor such who cannot *charity* afford; V.
 But all were social, jovial, merry souls,
 And briskly push'd about the flowing bowls;
 My faculties grew weak, the liquor stronger,
 I soon was tipsy and could stay no longer,
 Then silyly left them as my fancy led,
 And took *myself*, with decency to bed. VI.
 I lock'd my door that none should therein come, VII.
 And laugh'd that I had play'd them such a *bum*. VIII.
 With sweet *content* I slept away the night, IX.
 And did not wake until the morning light.
 The woodlark's song proclaim'd th' approaching morn,
 And *Phæbus* rays *salute* the waving corn. *Prize.*

Ingenious Answers to the Queries, Rebusses, Enigmas, &c. have been received from Miss Lee, Miss Brown, Silvia, Beatrice, and Mess. Rogers, James, Pepys, &c. which for want of room we are obliged to omit. The Prize of tea Diaries fell to the lot of Miss Eliz. Cockbill; who is desired to send to Mr. Carnan's, N^o. 65, St. Paul's Church-Yard, for them.

New QUERIES, REBUSSES, &c. to be answered in next Year's Diary.

I. QUERY, by Mr. Dalby.

How are we to understand this expression of Job, Chap. xxvi. ver. 5. Dead things are formed from under the waters, and the inhabitants thereof?

II. QUERY, by Mr. John Clarke.

Upon what natural principles are we to account for a seemingly total alteration of *air*, *climate*, and *seasons*, in many different parts of the

the world? Why are *summers* in *England* become of late years so wet and winterly, and in general, the weather so uncertain and variable? And why is *Montpelier* not the salutary spot it used to be?

III. QUERY, by Mr. John Wales.

Diarian artifts, make appear
How long fince *bats* first came in wear.

IV. QUERY, by Mr. Thomas Hoy.

In the second chapter of *Samuel*, it is mentioned that *Eli's* sons used a fesh hook to pull meat out of the pot. Query, was this hook barbed or not?

V. QUERY, by Mr. J. Burrow.

If a person breathes upon the blade of a new knife, razor, &c. the moisture immediately flies off. What is the reason of this?

VI. QUERY, by Miss Polly Lee.

As candles, &c. burn much faster in *Dr. Priestley's*, than in common air, might not some useful method of introducing and confining a similar kind of air in the substance of gunpowder, be contrived, in order to render it more forcible and instantaneous in its explosion?

I. REBUS, by Miss Dale.

A quarter of what at the tavern you spend,
And what's without either beginning or end,
With three fifths of a broad grin,---connected together,
Is a teasing companion in hot or cold weather.

II. REBUS, by Mr. Dalby.

The reverse of a hue that young *Phyllis* can boast,
And three fifths of a knife when the handle is lost,
If join'd,---to the knowledge of something you're led
That always grows thinner the more it is fed.

III. REBUS, by Aylesbury Jack.

Two thirds of a *fib* and two thirds of *bard-water*,
Are the foes which French soldiers pursue with great slaughter.

IV. REBUS, by Caput Mortuum.

Half a noun with as much of what's commonly hollow,
Is a runner, and one you're obliged to follow.

V. Paradoxical REBUS, by Mr. G. Pepys.

When to just half a thousand one evil you stick,
You've a damnable fellow as fierce as Old Nick.

VI. REBUS, by Mr. L. Walker.

A Roman chief, who *Sylla's* pow'r defy'd;
A Grecian hero, who by *Paris* dy'd;
A famous hunter, who a city built;
A man, who's charg'd in orient climes, with guilt;
An era, which the Turkish people prize;
A bird, which views the sun with steady eyes;

New Enigmas.

23

A sage of Athens, who their laws revis'd ;
A Roman prince, by all mankind despis'd ;
A man, whose chief companion was his lamp ;
What should be always near a foldier's camp.
Th' initials join'd, a town will bring to view,
For trade and riches parallel'd by few.

A Paradoxical Problem, by Mr. L. Silcock.

Diarian artists, if you please
To plant me thirty cherry trees,
Thirty-four rows, nor less nor more,
And in each row exactly four.

New ENIGMAS to be answered in the next Year's DIARY.

I. ENIGMA, by *Miss Kitty C*—.

I from the earliest ages date my birth,
Yet am not seen in water, air, or earth,
Fond of retreat, I seek the shady grove,
A foe to friendship, but a friend to love ;
The powers of music have no charms for me,
Yet strange to tell, I'm fond of harmony,
And tho' with wisdom I am known to dwell,
And calm content admits me to her cell ;
Yet blushing, ladies, I my weakness own,
To virtue I am utterly unknown.

II. ENIGMA, by *Miss Dale.*

Tell me, ye learned fair ones, what is this
Which all admire, yet very few possess ;
A virtue 'tis, to ancient maids unknown,
And prudes who spy all faults, except their own :
Lov'd and defended by the brave and wise,
Tho' knaves abuse it, and like fools despise.
Secure of me you can no envy move,
For none can envy those whom all must love.
In fact, my power adds a brighter grace,
And sweetens every charm in Sylvia's face.

III. ÆNIGMA, by the late Thomas Sadler.

Swift as the wind I cleave the liquid air,
When to my destin'd goal I would repair :
Oft doth the flying deer my fury own,
And bravest warriors hail me with a groan.
Sometimes in sportive mood by Perseus' arm
I have been sent to strike a dire alarm,
Amidst the feather'd race ; who soaring high,
By me arrested quit their native sky,
Rapid they fall in circling eddies round,
And strike their talons in the senseless ground.

The Ladies and Gentlemens Diary.

Bold Robin Hood in me was greatly skill'd,
 And often took me with him in the field!
 Despair and horror mark'd my fearful way,
 And stoutest heroes shudder'd with dismay.
 Sometimes less fear'd, tho' felt with great surprize,
 I take my station in fair Chloe's eyes:
 Then do the beaux my dreaded power try,
 And pining lovers in a moment die.
 Whene'er fly Cupid would invade a heart,
 He then invokes my never failing art;
 Secure in me he strikes the fatal blow,
 With love's hot fire the virgins bosoms glow.
 Sweet sleep forsakes their eyes, and from their breast,
 Are banish'd pleasing thoughts, and balmy rest.
 Tell me, ye fair, my name,---from whence I come,
 And may your cheeks preserve unfading bloom.

IV. ENIGMA, by *Mr. John Clarke of Lincoln.*

Altho' I'm us'd by ev'ry one,
 Of high or low condition,
 Yet seldom am confin'd alone
 To lawyer or physician.
 I'm thought mischievous as a cat,
 On various pretences;
 Strange tricks and whimsies I've been at,
 When playing with the wenches.
 No town within our king's dominions,
 But to my talents claim a share,
 Yet people form absurd opinions,
 And curse me oft for being there.
 I'm censur'd by the keenest tongue,
 Severely loaded with abuse,
 And drag a wretched life along,
 Alas! because I'm not of use.
 Innocent I am by nature,
 Free and light as noontide air;
 No harsh lineament or feature
 Ever in my face appear.
 The lies of tradesmen, politicians,
 And lottery-ticket sellers,
 Philosophers, theologicians,
 Cock-Lane ghost, or Punchinellos,
 The canting zeal of puritans,
 And Tabernacle preachers,
 The honest ways of courtezans,
 And vile death-hunting-searchers;
 All these the world will not believe,
 As faith is not their due,
 But pin their credit on my sleeve,
 Because I think them true.

V. ENIGMA, by Mr. B. Cleypole, of *West-Ham, Essex.*

Ye sage enigmatists, make room,
 And let your well known fav'rite come,
 Carefs'd by all the English nation,
 And holds distinguish'd reputation :
 But stop---perhaps you now will swear,
 Like boasting Falstaff I appear ;
 Because when view'd by some they tell ye
 Like him I'm little else but belly ;
 Yet I'll confess altho' esteem'd
 By others I'm a monster deem'd.
 No Sphinx or Hydra to surprize,
 Or Argus with his hundred eyes ;
 Of such contexture is my frame,
 A mouth and body's all I claim ;
 And tho' I'm neither flesh nor blood,
 Like human beings crave my food ;
 Th' Epicure whose constant care
 Is costly dainties to prepare,
 Has seldom such profuse supply
 Of rich and sumptuous fare as I ;
 But fate and knaves at once conspire
 That tortur'd I must be with fire ;
 And circling flames my entrails burn,
 Which unto smoke and ashes turn,
 Whilst I, oh horrible to tell,
 Am emblematical of hell ;
 But of those torments I make light,
 Because they bring an appetite ;
 For glutton-like know I receive
 All food that my attendants give.
 Amazement doubtless 'twill create,
 When I this well known tale relate ;--
 What I disgorge none will deny
 Proud mortals eat, or else must die ;
 Enough is said ; declare my name,
 And to the world my worth proclaim.

VI. ENIGMA, by Mr. Clarke, of *Farnham, n Surry.*

Ladies, a female slave behold,
 That's sore oppress'd by young and old,
 And begs you'll shew some pity on her,
 For friends all turn their backs upon her.
 Nor think that I your suppliant crave
 Your aid unmerited to have,
 Or wish like saints of Aaron's trade
 To labour less the more I'm paid ;
 For tho' I might exemption claim,
 Because your flesh and mine's the same ;

Or plead that by my shape's confest,
 I ne'er was meant for work, but rest;
 Yet such like Irish pleas some dozen,
 I leave to Paddy's cousin's cousin,
 Who'd rather than not live at ease,
 Lie down with dogs and rise with fleas.
 Tho' small my limbs, yet in a year
 I tons of holy garbage bear;
 Tho' slender I am often put
 To carry loads of learned gut;
 Oft laden with this ponderous freight,
 I groan beneath the sinful weight;
 Yet not from weakness or from fear,
 For know that I rude shocks can bear,
 Not blasts of rattling winds can move me,
 Nor thunders when they roll above me.
 The highest nobles cringe to me,
 The greatest monarchs bend the knee,
 For my assistance many sue
 In public and in private too;
 Ev'n ladies take me oft in hand,
 And when I fall they make me stand;
 Nor can without my aid divine,
 The lawyer, judge, or bishop dine,
 For I alone uphold them all,
 And but for me the Pope would fall.
 In my embrace has Sawney R——
 Oft seen the lovely *Polly Stow*,
 With Ragged Robin at her side,
 In flower of *** and ****y pride.
 Tho' I without the help of man,
 Mere children bear than women can;
 Yet think not I'm devoid of charms,
 For men oft sleep within my arms;
 Nay more, my mistress oft hath seen
 Me take my master in between.

Scylla, as sing poetic rogues,
 Was often lin'd with her own dogs,
 When danger threaten'd,--coward rout!
 In such like cases mine jump out.

When right divine was much in vogue,
 I was your non-resisting rogue;
 When high church Tories were in power,
 I play'd th' obedient passive whore;
 When drunken scoundrels rul'd the state,
 I kept bad hours and fat up late,
 Ev'n in these virtuous sober times,
 I often join in wicked crimes;
 When bloods to bawdy houses come,
 I bounce and fly about the room;

But when they to old Fielding trudge,
I stand as sober as a judge.

In former ages I was furr'd,
I next went bare as any board,
But if you're now dispos'd to find
My hairy bottom, look behind.

VII. ENIGMA, *by Mr. Leonard Walker.*

Ye wife and prudent, lend a patient ear
To one, whose friendship you shou'd all revere;
No needy sharper claims your sage regard;
To serve you well, shall be my sole reward.

I owe my being to the fruitful earth;
An artist form'd and gave that being worth:
All civil states my virtues highly prize;
Tho' nature's sons my noblest deeds despise.
In this blest isle, where justice freely flows,
My person's sacred; by the wisest laws;
The hapless wretch, who freedom takes with me,
Oft forfeits fame, and dearer liberty!
Whilst impious men religion disbelieve,
At church I still attend both morn and eve;
Nor Pope, nor council, tho' their zeal runs high,
Are truer guardians to the church than I.
I'm still the trav'ler's true and steady friend;
And in his journies I on him attend;
In foreign climes, tho' he should long sojourn,
With zeal I serve him, 'till his wish'd return.
The hoary miser oft in me confides,
To guard that wealth, which he with caution hides;
He safely may; I ne'er betray my trust;
'Thrice happy Briton, were thy sons as just!
The stage I sometimes tread, with great success,
All ranks applaud me, and my worth confess;
'Tho' Roscius was the fav'rite of the town,
He never gain'd more fair and just renown!
No master, yet, cou'd ever truly say,
That I demanded either thanks or pay,
Tho' watch and ward I keep, both night and day.
To heap up wealth, the world's great end and aim,
I leave to those, who sigh for pomp and fame.
Ye lovely fair! may I permission crave,
To prove, that I'm the dearest friend you have;
Your warmest friends must yield the palm to me,
For I'm the guardian of your chastity!
Tho' England's fair ones may my pow'r disclaim,
Iberia owns it, and reveres my name.
But I must now attend my master's call;
Adieu!-- and may success attend you all!

VIII. ENIGMA,

VIII. ENIGMA, *by Miss Eliz. Cockbill.*

Ye gentlemen in verse sublime,
 Excuse a female bard's weak rhyme ;
 Nor think like you I couplets chuse,
 Nor in such strains invoke the muse ;
 Nor shall I sing of lawns nor rills ?
 Nor flow'ry vales nor lofty hills,
 Nor of old Nereus nor his stream,
 Nor take the Sylvans for my theme.
 But such a topic let me chuse,
 As sportive souls can ne'er refuse.
 And, Sirs, if you my theme wou'd trace,
 You must consult old Nimrod's race ;
 And follow close whate'er betide,
 For to Actæon I'm ally'd.
 Tho' I'm no man, no bird, nor whale,
 I've neither shoulders, hair, nor tail.
 Two wings I have, tho' never fly,
 Nor direct objects can espy.
 My enemies I ne'er offend,
 Tho' many often seek my end.
 My habitation or retreat,
 Is a sweet pleasant country seat ;
 Secret's my cot, and seldom found
 Either above or under ground :
 Where thro' a life of fears I run,
 And range alternate with the sun.
 Whore is my name, and long has been,
 Tho' with my gallants seldom seen.
 And if by chance mankind I pass,
 They term me of the female race.
 Yet often in this mask of mine
 Is wrapt a substance masculine !
 'Tis strange ! Each sex in me unite,
 Yet still I'm no hermaphrodite !
 But, Sirs, if you my shape wou'd know,
 Pray look for me when at Soho !

PRIZE ENIGMA (*of 10 Diaries*) *by Mr. Dalby.*

Ye beaux, and feather'd belles attend ;---
 At my approach obsequious bend,
 Nor shun me, or you may expect
 In tears to mourn the dire neglect !
 While I, a handmaid of the graces,
 Shall cause you many damn'd wry faces.
 Is there who've seen, in Eastern pride,
 The Great Mogul triumphant ride ?---
 Upon the self same beast that bore him
 'Tis two to one I've rid before him ;---
 For know, I am, such is your will,
 The highest office born to fill.--+

No minister with all his arts
 Can boast such penetrating parts.
 In vain the tyrant strives to hide
 From me, who am the scourge of pride:
 For, should a wight, tho' high in place,
 Yet, born of mean ignoble race,
 Ambitiously usurp a crown,
 I pull the vile pretender down;---
 While on the verge of fate he reels,
 Mankind perhaps my vengeance feels:
 Yet, let me not increase your fear,
 A meagre form at best I wear;
 And, tho' you often me will find
 Like two with backs together join'd,
 A fool who shouldn't chance to know me
 With half an eye may see quite thro' me.
 When with majestic pace, you oft
In quærpo see me ride aloft,
 Tho' I am not accus'd of fear,
 Yet, coward like, I chuse the rear;
 There firmly fix'd, and safe from harms,
 Am half eclips'd by *Ublæ's* charms.---
 When crosses vex I make a stand,
 Nor do my business out of hand;
 Yet, *Garrick* like,---for I'm but small,
 The part I play is capital;
 But oft employ'd like statesmens tools
 In dirty jobs for knaves and fools,
 Then like some grov'ling dunce, you see
 That blockheads are my company;
 This, as a reason some expound
 With *morsieur* why I'm always found;
 Tho' with him seldom I'm at peace,
 And like him often *out of case*.
Taffy, *Got blefs bur*, it is said
 With me ne'er troubles much his head,
 Yet, from his eyes at *David's* shrine
 I once a year extract the brine,
 Which falling from his ruffet cheeks
 Is salt to toasted cheefe and leeks:---
 Nor let that image turn you sick,---
 I'm the *Arcanum Cephalic*;
 No *Pulvis Noftrum* equals me,
 From *dirty Scotch* up to *Rappee*.

After what's said, I need not name
 That I a bold intruder am;
 Nay, impudent, for 'tis averr'd
 I once catch'd *Moses* by the beard.---
 But hold, for now I make no doubt
 E'en *Numscull's* self can find me out.

Answers to the Mathematical Questions proposed in last Year's DIARY.

I. QUESTION, answered by Mr. Joseph Bird, jun. of Ipswich.

BY dividing the second equation by the first, $x^2 - xy + y^2 = \frac{b}{a}$, which taken from the first, gives $2xy = a - \frac{b}{a}$, or $xy = \frac{a^2 - b}{2a} = d$ by adding this to the first equation, and subtracting it from the above, we have $x^2 + 2xy + y^2 = a + d$, and $x^2 - 2xy + y^2 = \frac{b}{a} - d$, and extracting the square root, $x + y = \sqrt{a + d}$, and $x - y = \sqrt{\frac{b}{a} - d}$, whence $x = \frac{1}{2}\sqrt{a + d} + \frac{1}{2}\sqrt{\frac{b}{a} - d}$, and $y = \frac{1}{2}\sqrt{a + d} - \frac{1}{2}\sqrt{\frac{b}{a} - d}$.

In the same manner it was answered by Mr. Hugh Weetman of Bennington; Mr. W. Watson of Alnwick; Messrs. James, Merritt, Barker, John Clarke of Lincoln, and Hatton the proposer.

II. QUESTION, answered by Mr. Joseph James of Stoke-Bishop, near Bristol.

Let x and y be the required numbers; then $x^2 + y^2 - 1$ and $x^2 - y^2 - 1$ are squares, and their difference is $2y^2$, which being resolved into the factors $2y$ and y , and half the difference squared and made equal to $x^2 - y^2 - 1$, gives $x^2 = \frac{5}{4}y^2 + 1$, which assume equal to the square of $1 + vy$ and y will be found equal $\frac{8v}{5 - 4v^2}$ and consequently x equal $\frac{5 + 4v^2}{5 - 4v^2}$, in which if v be taken 1, $y = 8$ and $x = 9$.

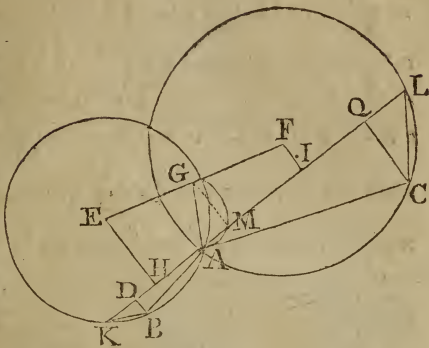
Nearly in the same manner this question was answered by Messrs. Ainsworth, Barker, Clarke, Fininley, Hedley, Moody, Merrit, Smith, Swift, Watson, Weetman, and the proposer.

III. QUESTION, answered by Mr. Ainsworth.

Upon AB, AC including the given \angle BAC, respectively describe segments of circles, containing $\frac{1}{2}$ right \angle 's. And bisect EF, the line joining their centers in G, draw GA, and upon it describe the semicircle GMA, in which inscribe the chord AM, equal to $\frac{1}{2}$ the difference between AB and AC. Then upon AM produced, let fall the \perp 's BD, CQ, and the thing will be done.

Demons.

Demorft. For produce AD, A Q meet the circles in E, L. and draw B E, C L. Also let all the \perp 's E H, F I. Then because G = G F, H M = M I. consequent-ly A I - A H = 2 A M = $\frac{1}{2}$ the given difference. And A K - A H = the given difference = A C - A B, or A L - A C = A K - A B. But because the \angle 's C



Q and B K D are by construction $\frac{1}{2}$ right \angle 's, Q L = Q C and D K = K B. Therefore A L = A Q + Q C, and A K = A D + D B, and consequently A Q + Q C - A C = A D + D B - A B, or which is the same thing, the diameters of the circles inscribed in the Δ 's A Q C and B D A are equal. — Q. E. D.

Algebraical solutions were also received from Mr. Hardy, the proposer, and several others.

IV. QUESTION, answered by Mr. William Watson of Alnwick.

From the given equation is had $\dot{y} = \frac{a \dot{x} + x \dot{x}}{\sqrt{a^2 - x^2}}$, or by taking the fluents $y = \text{arch whose sine is } x \text{ to rad. } a. - \sqrt{a^2 - x^2}$. Also $x \dot{y} = \frac{a x \dot{x} + x^2 \dot{x}}{\sqrt{a^2 - x^2}}$, whose fluent is $\frac{1}{2} a \times \text{arch}$, whose sine is x to rad. $a - a + \frac{1}{2} x \times \sqrt{a^2 - x^2}$. Or by supposing that $x = 0$, when $y = 0$, the correct fluents of \dot{y} and $x \dot{y}$ will be $a - \sqrt{a^2 - x^2} + \text{arch}$, whose sine is x to rad. a . And $a^2 + \frac{1}{2} a \times \text{arch}$, whose sine is x to rad. $a - a + \frac{1}{2} x \times \sqrt{a^2 - x^2}$, which last taken from $x y = a x - x \sqrt{a^2 - x^2} + x \times \text{arch}$, whose sine is x to rad. $a -$ will give the fluent of $y \dot{x}$.

In the same manner it was also answered by Mr. Ainsworth; and the answers given by Messrs. Bonnycastle, Barker, Caput Mortuum, Hampshire, James, Merritt, Pepys, Weetman, and the proposer, were nearly similar.

V. QUESTION, answered by Mr. Ainsworth, and the proposer.

Put $\frac{1}{1.05} = r$. and for convenience suppose $a = 1$. Then the present value of the whole estate will be $r + 2 r^2 + 3 r^3 + 4 r^4 + \&c.$

$$= \frac{r}{1-r} 2 \dots \text{And the value of the reversion, or the terms of the series, after the first } x \text{ are } \frac{x+1}{r} + \frac{x+2}{r^2} + \frac{x+3}{r^3} + \dots = x r^x \times \frac{r^x + r^{x+1} + r^{x+2} + \dots}{r^x + r^{x+1} + r^{x+2} + \dots} + r^x >$$

$$\frac{r^x}{r + 2r^2 + 3r^3 + 4r^4 + \dots} = x r^x \times \frac{1}{1+r} + r^x \times \frac{1}{1-r} 2$$

which must per question be $= \frac{1}{2} \times \frac{r}{1-r} 2$, that is $x r^x + r^x \times \frac{1}{1-r} =$
 $\times \frac{1}{1-r}$. In numbers $x r^x + 2 1 r^x = 10 \frac{1}{2}$, or $r^x \times x + 2 1 = 10 \frac{1}{2}$, from which x may easily be found $= 33, 9$, or nearly 34 years, the time required.

The answers given by Messrs. Bonnycastle, Dalby, Hampshire, James, Sanderfon, and Pepys, were nearly the same as above.

N. B. The sixth and seventh questions were inserted by mistake, the one having already been answered in Mr. Lawson's Tangencies, and the solution of the other taking up more room than is consistent with the limits of the present diary.

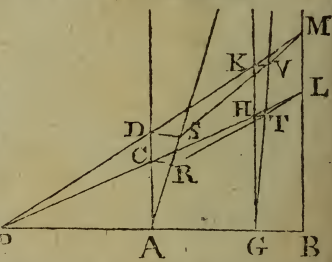
VIII. QUESTION, answered by Mr. Ainsworth.

Let s be the required sum, and $2n + 3 = m$, or $m = 2$, then by the nature of the series $m-2 \times m-1)^2 \times m^3 = s$, or $m^4 - 4m^3 + 4m^2 - 2m = s$. The correct integral of which is found by page 46, Emerson's Increments, to be $s = \frac{m^7}{14} - \frac{5}{8} m^6 + \frac{7}{2} m^5 - 6 \frac{1}{12} m^4 + 3 m^3 + \frac{5}{4} m^2 - \frac{4}{7} m - \frac{3}{4}$.

This question was also answered by Mr. Ur. Bowerburne, from Sterling's Differential Method, and by Mr. George Sanderfon, and Mr. John Bonnycastle according to the method of Increments.

IX. QUESTION, answered by Mr. John Hampshire.

Let BA be produced to P so that BP may be to PA in the given ratio of BL to AR and BM to AS and draw AC and GH parallel to BM, and join PL, PM meeting AC and GK in the points C, D, H, K and join the points C, R and DS, H T and K V.



Then by construction, BP : PA :: BL : AR but BP : PA :: BL : AC therefore AC = AR and by the same reason AD = AS and DS parallel to CR; again, because AD and GK are parallel, BG : GA :: LH : HC :: MK : KD, but BG : GA :: LT : TR :: MV : VS

V S by hypothesis; wherefore CR, DS, HT and KV are parallel; now $HT : CR :: BG : BA$ and $CR : DS :: AC : AD$, and $DS : KV :: (MD : MK) :: BA : BG$, therefore $HT : KV :: AC : AD$ but $AC : AD :: GH : GK$ therefore $GH : GK :: HT : KV$ and consequently the points G, T, V which divide the line BA, LR, MS in the given ratio of BG to GA are in a right line

Scholium. This question is in effect the same as Newton's 23 lemma, which was not observed by the proposer at the time of sending it; however it will doubtless be agreeable to the readers to have different solutions to so useful a problem.

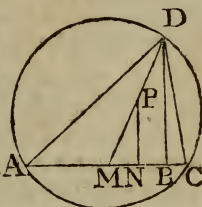
In the same manner it was answered by Mr. Ur. Bowerburne; very elegant geometrical demonstrations were also received from Messrs. Ainsworth, Sanderfon, and Mofs the proposer.

X. QUESTION, answered by Mr. William Fininley.

Construc. Bisect the base AC in M, on AC describe a segment containing the given vertical angle, and take any line MN and NP perpendicular to it, so that MN may be to NP as the radius of the circle to the given base; join MP meeting the circumference in D, then ADC is the triangle required.

For draw DB parallel to NP then $MB : BD :: R$ (radius) : AC therefore $DB \times R = AC \times MB$ consequently $DB \times \text{diameter} = AC \times 2MB = AD^2 - DC^2$; but $DB \times 2R = AD \times DC$ by 6. Eucl. therefore $AD \times DC = AD^2 - DC^2$.

Geometrical constructions were received from Messrs. Ainsworth, Barker, Moody, and John Clarke of Lincoln; and very elegant algebraical solutions from Messrs. Watson, James, Weetman, Merritt, Pepys and Caput Mortuum.



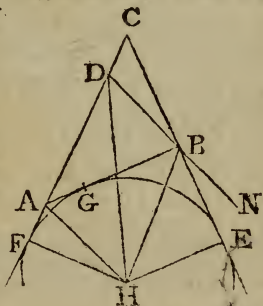
XI. QUESTION, answered by Mr. George Sanderfon.

Analysis. Let CD be the given difference, then because AD and AB are equal, $ADB = ABD$, and FAH being half FAB is equal to ADB, therefore AH and DB are parallel, consequently $AHB = HBN$ but AHB is half the supplement of ACB (by Prop. 3, Diary 1777) therefore HBN is half the supplement of C: Hence this

Construc. On HD describe a circular segment containing an angle equal to half the angle C together with a right angle, cutting CE in B, then ACB is the triangle required.

Limitation. When the circular segment described on DH neither cuts nor touches CB the question is impossible; it is also evident that whether the point D be in AC or AC produced the method will still be the same.

In the same manner it was answered by Mr. John Burrow; also very elegant geometrical solutions were received from Messrs. Ainsworth,



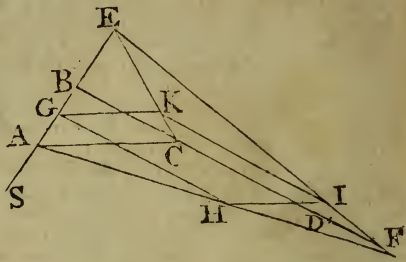
34 The Ladies and Gentlemens Diary.

Bonnycastle, Barker, Dalby, and Dixon; and algebraic answers from Messrs. James and Watson.

The same answered by the Rev. Mr. Crakelt, of Northfleet, in Kent.

Construc. Make $BD =$ the given perimeter, the $\angle DBS =$ the given vertical one, and BE and DF each equal the given difference

betwixt the base and the side, and join points E and F : take EG at pleasure, and parallel to BD draw GH equal to $2GE$; also to EF apply $HI = GE$, and complete the parallelogram $GHIK$: then thro' the points $E, K,$ draw the line EKC , and afterwards CA parallel to KG , and ABC will be the triangle required.

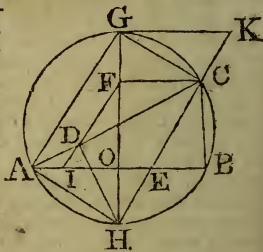


Demon. By similar triangles $EG : GK = HI$ (Euc. 1. 34.) $:: EA : AC$. But $HI = EG$, by *constr.* $\therefore EA = AC$, and consequently the difference betwixt AC and AB is EB . Moreover, by sim. triangles, $EA : EG :: EC : EK :: CF : KI$ or GH ; but $GH = 2GE$, by *constr.* $\therefore CF = 2EA = EA + AC$; and of course, since BE and DF are equal, $[CF + FD$ or $CD = AE + EB + AC$ or $AB + AC$, and adding BC to each] $AB + BC + CA = BD$ the given perimeter. Q. E. D.

XII. QUESTION, answered by Mr. George Sanderson.

Construc. Let M be half the given base, and N half the difference of the sides, make CE equal to given bisecting line on which produced, take CK to EK in the duplicate ratio of N to M ; again by prop. 5. cor.

3. D. 1777. produce KE to H , so that $CK : KH :: N^2 : HE \times HC$ and having erected on KH the perpendicular CG to meet a semicircle described on KH , join GH on which describe the circle $HAGB$ and thro' E draw A, E, B , to cut GH at right angles in O , and meet the circle in A and B join AC, BC and ACB is the triangle required.



Demonstr. Join AH, AG, GK and to GH and AC draw the perpendiculars CF and HD through D draw FI meeting AB in I .

The right angled triangles GCH and ADH are similar, and the triangle KCG is similar to $HCG \therefore CK^2 : KG^2 (CK \times KH) :: AD^2 : AH^2 (= HE \times HC) :: CK : KH :: N^2 : HE \times HC$ (by *construc.*)

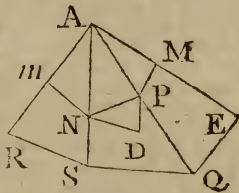
onstruc.) wherefore $AD = N$ equal (by prop. 9. page 40. Diary, 1777.) to half the difference of AC and BC . moreover as the right angles CFH and CDH are subtended by the same base CH , a circle will pass through the four points C, F, D, H , whence the angle $DFH = DCH = AGH$, (Euc. 21. 3.) wherefore FI is parallel to AG . and by sim. triangles $AD^2 : GC^2 :: AH^2 : GH^2 :: AO^2 : AG^2$ whence alternately $AD^2 : AO^2 :: GC^2 (= GF \times GH) : AG^2 (= GO \times GH) :: GF : GO :: CK :: KE :: N^2 : M^2$ (byonstruc.) again by alternation $AD^2 : N^2 :: AO^2 : M^2$ but $AD = N$ therefore $AO = M$ but AO equal to half AB (Euc. 3. 3.) therefore M equal to half AB . Q. E. D.

Algebraical solutions were also received from Messrs. Barker, Bowerburne, Fininley, James, Hampshire, Merritt, Pepys, Watson and Veetman, &c. and geometrical ones from Messrs. J. Burrow, and I. Dalby.

XIII. QUESTION, answered by Mr. Isaac Dalby, the proposer.

This question requires that when the three planes are formed into a solid angle, the two first planes may make a given angle; which is a case that sometimes happens among carpenters and stone-cutters, &c. and its reverse being equally necessary, I shall here give solutions to both; as they may sometime happen to be useful to the practical workman.

First, Let RAS, SAQ, QAE be three given plane angles supposed to be spread out on a plane; it is required to find the angle that would be made by the planes RAS, EAQ supposing them revolved about SA and AQ till SA coincide with AE .



Take Am equal AM , of any given length, and draw MP and mN perpendicular to AE and AR meeting AQ and AS in P and N , and on PN describe a triangle so that $PD = PM$, and $ND = Nm$, then NDP is the angle required.

The demonst. will be evident by conceiving the triangle NDP revolved about NP when AR and AE coincide, for then the points P, D and M coincide also.

Secondly, Let the angular planes RAS, QAE be given to find SAQ so that when RA coincides with AE the angle made by those planes may be given.

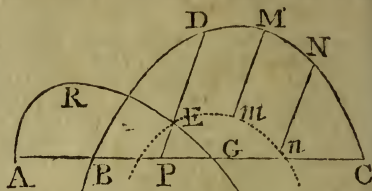
Take $Am = AM$ and draw mN and MP as before, then make an angle NDP equal the given one and take $DN = Nm$ and $DP = PM$, then on NP make a triangle whose sides are the given lines NA, AP which determines the required triangle.

Solutions were also given by Messrs. Ainsworth, Bonnycastle, Hampshire, Sanderfon and Pepys.

XIV. QUESTION, answered by the Proposer.

In the given curve BCD let there be taken as many points $D, M, I, \&c.$ as are sufficient to determine a curve of the same kind (for example, 3 for a circle, 5 for a conic section, &c.) and parallel to the line

given in position draw Mm , Nn , &c. equal to the given line; then through the points m , n , &c. draw a curve of the same kind as the given one, meeting AR G the other given curve in E ; then DEP will be the line required: For if from a point, lines be drawn, and lines be taken in each having a constant ratio, then if the extremes of one fall in a curve of any kind, the extremes of the others will fall in curves of the same kind; and when the point is at an infinite distance, as in the present case all the lines DE , Mn , will be equal, and BE mn equal to $BDMN$.



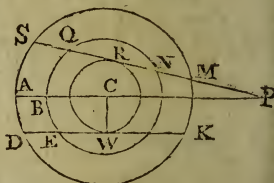
This Problem will be found of great use in resolving and determining the limits of many geometrical questions; I shall only subjoin two of the easiest examples.

1. Let there be given, two circles in magnitude and position and also the direction of a line, it is required to intercept between the peripheries of the two circles, a line parallel to this line which may be the least or greatest possible.

Suppose a line drawn through the centre of one of the circles parallel to that whose position is given; then if this circle be supposed to move along this line till it touch the other, it is evident that when it touches it will be at its limit, and in that case the distance of their centres will be the sum or difference of their radii: If the part intercepted is to be of a given length it is only requisite to set off that length from the centre in the line aforesaid, and intersect the other with the radius.

2. ASF and BSQ are two concentric circles and P a given point; required to draw a line through P , so that the intercepted part QS may be of a given length.

Join PC and draw DEW parallel to PC so that DE may be the given length, let CW be perpendicular to DW and with the distance CW describe a circle and draw a line from P to touch it, meeting the other circles in Q and S then SQ is the given line. For $DK = SM$ therefore $DW = SR$ but $EW = QR$ consequently $DE = SQ$; and the limits are determined by the last.



The construction is the same whether the point be within or without the circle, and serves for all that *Dr. Horsley* has split into a dozen cases, and filled eight pages of his *Book of Inclinations* with; and here it may not be amiss to observe that the limits of the problems contained in that book, may be determined in a much simpler manner than that used by the Doctor, from this principle; that if the rectangle of two quantities be given, their sum will be least when their difference is least, and their sum greatest when their difference is greatest.

This question was also answered by *Messrs. Ainsworth, Bonnycastle &c.* and several others.

XV. QUESTION, answered by Mr. J. H.

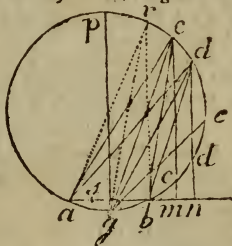
As the section of the solid in any part whatever, parallel to the horizon remains the same, it is evident the content of the solid will be the same as that of a prism of the same height; and as the velocity of any point assumed in the triangle may be conceived to be divided into an equable horizontal motion, and a vertical one uniformly accelerated, the lengths of the spiral curves described by the angular points will be the same as those of parabolic arches. *The manner of determining the surfaces of figures generated in a similar manner will be shewn in a future number.*

In the same manner it was answered by Mr. Ainsworth, and some others.

PRIZE QUESTION, answered by Mr. Jeremiah Ainsworth.

Upon any line ab taken at pleasure describe a segment of a circle to contain an angle equal to the common difference of the arches; which bisect by the diameter gp , and make the angles pgd , pgc equal to the respective distances of the middles of the equal arches from the beginning of the quadrant: Then if e be the middle of the semicircle cep , the angles dge and cge will evidently be their distances from the middle. On ab produced * let fall the perpendiculars dn , cm and join da , db , ca , cb ; then since by Eu. 29. 1. the $\sphericalangle gdn = d$

r and $gcm = cgp$, also $gdb = gcb$ by construction, $\frac{1}{2}$ the common difference of the arches. It therefore follows that the 4 arches themselves will be the measures of the \sphericalangle 's ndb , nda ; mb and mca respectively; consequently the ratio of their respective tangents will be that of bn to an , and bm to am . Of the two arches ec , ed let ec be the greater, and consequently bn greater than bm . take $bn : ba :: bm : bs$. then since bn is greater than bm , ba is greater than bs , and consequently am than sm . but by composition $an : am :: bm : sm$. and because sm is less than am , bm has to sm a greater ratio than it has to am ; consequently bn has to an a greater ratio than bm has to am . Q. E. D.

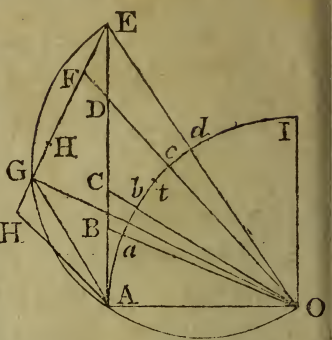


And when $ed = ec$. the proposition is evident — therefore all the cases are demonstrated — * that the $\perp cm$ must fall upon ab produced appears from hence; that if the diameter ar be drawn and rb joined, it will be \perp to ab (by Eu. 31. 3.) therefore by the nature of the quest. and construction the $\sphericalangle pgc$ can never be equal to or less than half the common difference of the arches $= grb = pgr$.

The same answered by Mr. George Sanderfon.

Let $A I$ be the given quadrant, e the middle point, O the center, and Aa , Ab , Ac , Ad , the four arches taken such that ab , the diff. of the two first may equal to cd the diff. of the two last; also let AB , AC , AD , and AE be tangents to the said arches; and having joined OB , OC ,

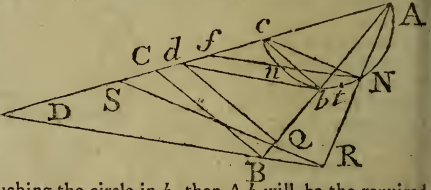
OD, OE, on OE as a diameter, describe the semicircle OAE, to which draw OG making the angle $\text{EOG} = \text{AOC}$. join E, G, cutting OD produced in F, and AH drawn \parallel to OD in H. Then because AE is \parallel to OI and AH to OD the angle $\text{EAH} = \text{FOI} (= \text{COI})$ and the angle $\text{EAG} = \text{EOG}$ (Eu. 21. 3.) = (by const.) AOC or AOB . But as the arch $ab = cd$, and $\text{At} = t\text{I}$, when bt , is greater than tc , the angle AOB , (AOC) is manifestly less than FOI (COI) and when equal, equal; and when less, the angle AOB (AOC) is greater than FOI (COI). Whence the angle EAH is accordingly greater equal to or less than the angle EAG , and the line EH, accordingly greater equal to or less EG, but the triangles GOE and GOF are respectively equiangular to the triangles AOC and $\text{AOB} \therefore \text{AC} : \text{AB} :: \text{GE} : \text{GF}$ and by similar triangles $\text{AE} : \text{AD} :: \text{HE} : \text{HF}$; but when HE is equal to GE (or the point H falls in G) $\text{HF} = \text{GF}$, then $\text{GE} : \text{GF} :: \text{AC} : \text{AB} :: \text{AE} : \text{AD}$, again when HE is greater than GE the ratio of GE to GF is greater than that of HE, to HF, and when less, less, (as is demonstrated Barrow's Geom. Lectures, page 121). Therefore when HE is greater than GE (bt greater than ct) CA to AB is a greater ratio than EA to AD, and when less, less. Q. E. D.



The same answered by Reuben Burrow.

Lemma. DA and DB are two lines given in position, and A a given point in DA; it is required to draw two lines AB, BC making ABC a given angle so that AC may be the least possible.

Take any line Ac and describe a segment thereon containing the given angle, and draw db parallel to DB touching the circle in b, then Ab will be the required position of AB.



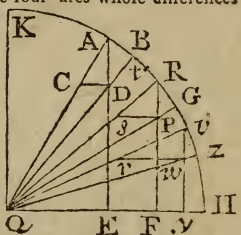
For by similar triangles $dA : Ac :: DA : AC$, and if any other line AR be drawn, and RS make the given angle with it, and Nf be parallel to BD, then $fA : Ac :: DA : AS$ but the ratio of dA to Aa is greater than that of fA to Ac and consequently the ratio of DA to AC is greater than that of DA to AS wherefore AS is greater than AC.

Corollary 1. Let the given angle ABC be right and dQ perpendicular to Ab, then if it was required to find two arcs differing by a

given quantity so that the tangent of the greater should have to the tangent of the lesser the least ratio possible, the greater arc would exceed 45° by half the given difference, and the lesser would be less than 45° by half the difference: for if $A t$ be half the semicircle, $A c b$ is $= 45^\circ + b c t = 45^\circ + \frac{1}{2} A d b$ and $b d Q = A d Q - A d b = A c b - A d b = 45^\circ - \frac{1}{2} A d b = D A B$.

Corollary 2. Hence also the more the angle $D A B$ varies from 45° — $\frac{1}{2}$ the diff. the ratio of $D A$ to $D C$ becomes the greater.

To apply this to the question. Let $K H$ be a quadrant, bisected in t , and let $A H$ and $B H$, $R H$ and $G H$ be four arcs whose differences $A B$ and $R G$ are equal; then if $A B = t R$ then (because radius is a mean proportional between the tangent and cotangent) $t \cdot R H : r :: r : t \cdot H B$ and $t \cdot G H : r :: r : t \cdot A H$ wherefore $t \cdot R H : t \cdot G H :: t \cdot A H : t \cdot H B$ that is $R F : F P :: A E : E D$ but $R F : F P :: R Q : Q S$ and $A E : E D :: A Q : Q C$, therefore $A C$ and $R S$ are equal; but if any arc $v z$ equal to $R G$ be taken at a greater distance from t than $R G$, and $v w y$ be drawn \perp to $Q H$ meeting $Q z$ in w , and $w r$ be parallel to $Q N$ meeting $Q v$ in r , then $v r$ will be greater than $R S$ by the lemma, and consequently the ratio of $v Q$ to $Q r$ or $v y$ to $y w$, is greater than that of $R F$ to $F P$, and on the contrary when $v z$ is taken nearer to t , the ratio will be less.

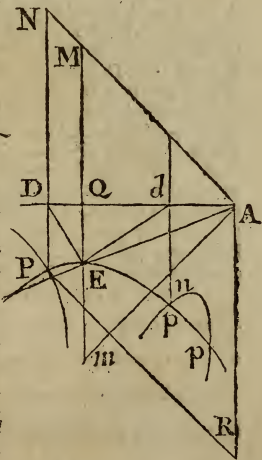


The Prize of Twelve Diaries was the lot of Mr. Ainsworth, and that of Six, of Mr. George Sanderfon.

Answer to the PRIZE QUESTION, omitted last Year.

Lemma. Given the base, an angle at the base and the rectangle made by the side adjoining to it, and the sum or difference of the other two; to find the triangle.

Let AE be the base, EAD the given angle, draw EQM perpendicular to AQ and take $QM = Qm = QA$ and with the asymptotes AM , AR , and Am , AR , describe two hyperbola's whose powers are the rectangles of the sum and difference respectively; also describe an equilateral hyperbola whose axis is EQ meeting the others in P, p , and draw $P D, p d$ parallel to AR meeting AD in D, d ; then ADE , $A d E$ are the triangles required.

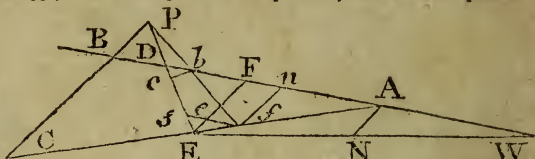


For $DA = DN$ and $DE = DP$ therefore $AD + DE = NP$, and $(AD + DE) \times AD = PN \times AD = ANP R =$ the given power of the hyperbola: Also $dE = dp$ and $Ad = ds$, therefore $dE - dA = np$ and

consequently $(dE - dA) \times dA = np \times dA = nprA =$ the given quantity.

Hence if any point E be assumed in AC (see Fig. 2.) and EF be parallel to AN and FM = FE and if D be found by this lemma, so that $(AD + DE) \times DE = AM \times EW$ then if a line be drawn thro' the point P || to DE a similar triangle will be determined.

To apply this to the problem in question, Let PC be parallel to



AN, then it is evident that the triangle will have no limit when drawn on the side of PC farthest distant from A, but when drawn on the contrary side, there may be found such a triangle DEF as will when the question is possible be the limit of the triangles drawn on each side of it; which limit may be thus investigated.

Let P*f* be drawn indefinitely near PE, also *bc* parallel to AC and *fcs* to AB, then because the triangle DEF is at its limit, by the supposition; the triangle *bfn* will be ultimately equal to it and their variations also equal, that is $Dc + Db + Ee = Fn$. But $DA : DE :: Db : Dc$, and $FA : FE :: Fn : Ee$ therefore $Dc + Db + Ee = \frac{DE}{DA} \times Dc + Dc + \frac{FE}{FA} \times Fn = Fn$, hence $Db : F$

$s :: (FA - FE) \times AD : (AD + DE) \times AF$; but $Db : sf :: PD : PE$ and $sf : FE :: DA : AE$, and $fE : Fn :: AE : AF$ consequently $Db : Fn :: PD \times DA : PE \times AF$; but $PD \times DA : A : PE \times AF :: (AF - FE) \times AD : (AD + DE) \times AF$, wherefore $PD : PE :: AF - FE : AD + DE$: Let EW be parallel to AD meeting PA in W, and FM = FE then because $PD : PE :: DA : EW$ therefore $DA : EW :: AF - FE : AD + DE$ that is $AD : EW :: AM : AD + DE$. Hence this.

Construction. Draw PDE (by the foregoing lemma) so that $AD \times (AD + DE) = AM \times WE$ and EF parallel to AN, then DEF is the triangle required.

N. B. The solution of the barter question at p. 20. being founded on Malcolms false principle, which hath generally been used by most of the modern writers, I drew up, and intended to give a paper on that subject in last year's Diary, but being obliged to defer it, shall here insert two cases only, from whence the aforesaid solution may be corrected and answers given to problems of a similar kind.

1. Suppose A has goods which he sells at *a*, but barterers at *b* to have $\frac{m}{n}$ parts of the amount in ready money; B has goods worth *c* each; what price must he rate them at, to be equivalent to A's barter price?

Let *x* be the price required, then as A receives $\frac{mb}{n}$ in ready money for each piece bartered which is only worth *a*, the remaining part of each

each piece which is not paid for but exchanged is only worth $a - \frac{mb}{n}$;

but A values it in barter at $b - \frac{mb}{n}$, therefore c must have the same

ratio to x as $a - \frac{mb}{n}$ to $b - \frac{mb}{n}$: Hence this rule.

Subtract $\frac{m}{n}$ parts of A's barter price from his selling price, and also from his barter price and say, as the first remainder is to the second, so is B's selling price to his barter price required.

2. Suppose A has goods worth a each which he charges in barter at b ; and B has goods worth c each, which he would barter with A, to have $\frac{m}{n}$ parts of the whole in ready money; at what price must B rate his pieces to be equivalent to A's barter price?

Let x be the price sought, then $\frac{mx}{n}$ is the ready money B receives each piece he barter, and therefore the real value of that part of each

piece which is not paid for, but exchanged, is $c - \frac{mx}{n}$; but its barter

price is $x - \frac{mx}{n}$, wherefore $c - \frac{mx}{n}$ must be to $x - \frac{mx}{n}$ as a to b ,

and consequently by reduction $a + \frac{m}{n-m} \times b : b + \frac{m}{n-m} \times b :: c : x$

which gives this rule.

Add $\frac{m}{n-m}$ parts of A's barter price to his selling price, and also to his barter price, and say; as the first sum to the second, so is B's selling price, to his barter price.

A correct solution to the 12th question will be inserted next Year.

As to S. Clark's objections in the T. and C. Magazine, they can impose upon none but such as are great dunces as himself and therefore deserve no notice.

ARTICLE XVII.

Additional Remarks on the Equation of Payments.

By Reuben Burrow.

“THE ingenious and learned professor Hutton, Esq.” having in the last edition of his Arithmetic, introduced a new and very polite method of confuting the arguments advanced in the Diary for 1777, on the subject of equation of payments; viz. by representing the writer as a “malicious defamer and an ignorant pretender;” and notwithstanding the authority of so considerable a personage, there being still many people so obstinate as to retain their former opinion, that *abuse* is not

demonstrated,

demonstration, and that false reflections on a person's moral character should have no place in matters of science; I have therefore in respect to such of my readers, taken the liberty, of giving some farther confirmations of what I before advanced, and also to shew, that the rule which the "ingenious professor" affirms to be "*the only true one,*" is not only false, but even false on his own principles: that both Kersey's principle and Malcolm's when rightly applied bring out exactly the same conclusion as the old method which he has reprobated, and that the *learned professor's* mistakes arise from not knowing how to find the amount of a sum of money for a given time at simple interest.

As compound interest

"Is an increase of money day by day

"And month by month, exactly in proportion

"To the elapse of time"-----

So simple interest is universally allowed to be that whose interest is supposed to bear no interest; or which is the same, it is a sum of money payable *at the end of the time* of any transaction, for the use of money during that time, according to agreement: the truth of this will fully appear from the general practice of the best writers, and from common acceptation; for when transactions are settled according to simple interest, the supposition that the interest bears no interest is the same thing as supposing it to be of no advantage either to the debtor or creditor during the time of the transaction; but to have the use of money is certainly an advantage, and therefore the interest cannot be payable till the end of the time; for if it be payable sooner the creditor has doubtless a right to use it, and of course acquires an advantage by it, or which is equivalent, gains interest upon interest according to some species of compound interest; which is contrary to the supposition; and consequently either the interest is not due till the end of the time, or else it is no advantage to have the use of money: But perhaps the professor, as being a schoolmaster, may like the argument better in this form:

1. If any thing be payable in the intermediate time, it must be interest;

2. But the interest is allowed to be of no use to either party in the intermediate time;

3. Therefore, that which is payable before the end of the time is of no use to either party. Now how the professor will contrive to pay the interest so as to be of no use to either party I cannot devise, unless he do it in the new halfpence that nobody will take;—but false principles are not to be established by a quibble.

Corollary 1. Hence if a sum of money be put out to interest for a given time, the creditor has no right to half the interest at the expiration of half the time, but only to such a part as would amount to half the interest at the end of the time; and so for other intervals, &c.

Corollary 2. Hence also, if $1l.$ be put out to interest at the rate r for the time t ; its interest for any time x less than t is $\frac{rx}{1+rt-rx}$

For $1 : r :: t - x : rt - rx$ the interest of $1l.$ from the time x to the expiration of the remainder of the time t , therefore $1 + rt - rx$ is the x payable

amount of 1l. in that time; but rx is the interest of 1l. for the time x payable at the end of the time t , wherefore $1 + rt - rx : 1 :: r$

$x : \frac{rx}{1 + rt - rx}$ the value of the interest at the end of the time x :

Also the amount of 1l. in the time x when put out as above will be $\frac{1 + rt}{1 + rt - rx}$, which becomes $1 + rt$ when x is equal to t .

This being premised; let M and N be two sums of money; the first payable directly, and the other at the end of the time t ; to find the equated time according to Kerfey's principle.

Let x be the equated time; then because the amount of 1l. in the time t is $1 + rt$, the present value of N is $\frac{N}{1 + rt}$ and therefore $M +$

$\frac{N}{1 + rt}$ or $\frac{M + N + Mrt}{1 + rt}$ is the sum of the present values, which

according to Kerfey must be equal to the present value of $M + N$ payable at x ; now by cor. 2. the amount of 1l. in the

time x is $\frac{1 + rt}{1 + rt - rx}$ therefore $(M + N) \times \frac{1 + rt - rx}{1 + rt}$ is

the present value of $M + N$ which being made equal to $\frac{M + N + Mrt}{1 + rt}$

we have $x = \frac{Nt}{M + N}$ which agrees with the old method.

The same data being supposed, let Malcolm's principle, of the equality of interest and discount at the equated time, be applied: Then

the interest of M for the time x being by cor. 2, equal to $\frac{Mrx}{1 + rt - rx}$,

and the amount of 1l. from the equated time x to the time t being $1 + rt - rx$, and the interest $rt - rx$, the discount of the sum

N at the time x will be $\frac{Nrt - Nrx}{1 + rt - rx}$, which being made equal to

$\frac{Mrx}{1 + rt - rx}$ the interest; x is found equal to $\frac{Nt}{M + N}$ the same

as before, and therefore both Kerfey's and Malcolm's principles rightly applied agree exactly with the old method.

To prove that the professor's conclusion is false, on his own principles, nothing more is requisite than to calculate the interest from his equated time to the time of the last payment, according to his own method, and it will be found that the creditor will gain more this way, than he could by receiving the payments as they become due, which must certainly be a disadvantage to the debtor, unless the professor can demonstrate that two people may deal together upon equal terms; that one can have no advantage but what he derives from the other, yet one of them shall gain and the other shall not lose: As the usual pretence that the business is truly settled at Malcolm's equated time, and

and that the time before or after it, has nothing to do in the matter; if there was any validity in it, the consequence would be, that it is best to judge of things only by halves, and that truth is variable like the ordinate of a curve, and a lie to-day may be true tomorrow, &c. &c. But it is not worth while to bestow any farther confutation on a method so grossly and palpably false, and therefore as the errors remain uncorrected in the two last editions of his book (*viz.* the third and fifth), I shall only advise the learned professor to correct them in his next seventh edition.

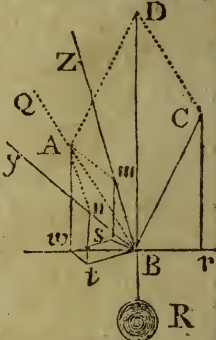
ARTICLE XVIII.

Miscellaneous Problems and Solutions, &c.

By Reuben BURROW.

PROPOSITION I. THEOREM.

IF R be a weight supported in equilibrio by 3 cords, B C, B z, B y, I knotted at B; then if a plane be supposed to pass thro' R B, B C, meeting the plane passing thro' B z, B y in B Q, the force compounded of the forces in the direction of B z, B y, will fall in B Q. For the forces in B z, B y compound a single equivalent force in the plane z B y, and if this force is not in the line B Q it may be reduced to a force in B Q and another perpendicular to it; now either the forces B A and B C in the directions B Q B C in the plane C B Q keep the body in equilibrio with respect to the direction of the plane C B Q, or not; if they do, that is, if they have equal horizontal forces, then the former force perpendicular to the plane C B Q acting at B will draw the body out of the plane



and \therefore it will not be in equilibrio; if the forces B A, B C reduced to a horizontal direction are not in equilibrio, one will exceed the other, and this excess acting at B in the plane C B Q, together with the former acting at B in a direction \perp to this plane, will compound a third force which has no opposite force to counterbalance it, and therefore the body will not be in equilibrio, contrary to the supposition.

PROPOSITION II. PROBLEM.

Given the directions of three forces supporting a body in equilibrio; required the ratio of the forces.

Let B C, B z, B y, be the directions of the forces and B R the direction of the force sustained; let a plane pass thro' B R, B C meeting the plane passing thro' B z, B y, in B Q; take B D = the force B R in R B produced and in this plane draw D A parallel to B C meeting the intersection of the plane B Q in A; then draw A m \parallel to B y and A n \parallel to B z, then B z, B m, B C express the forces of B y, B z, B P, from

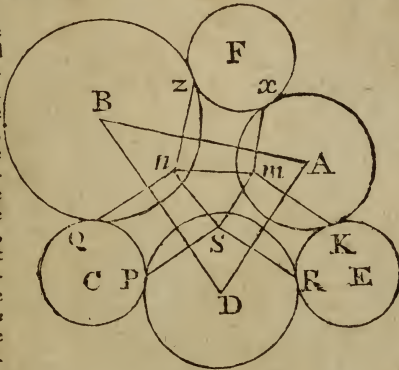
from whence the practical construction is evident; or the quantities may be found by calculation for $Bn = \frac{BD \times s.CBr \times \text{cof. } CBr \times s.wBs}{r \times s.tBs \times \text{cof. } nBt}$

$$BC = BD \times s.CBr, \text{ and } Em = \frac{BD \times s.CBr \times \text{cof. } CBr \times s.wBs}{r \times s.tBs \times \text{cof. } mBs}$$

PROPOSITION III. PROBLEM.

If three hemispheres be placed in a triangular situation, with their sections on a horizontal plane, and a fourth sphere be sustained by the three; required the pressure against each.

Let A, B, D be the centers of the three given hemispheres and E, F, C different positions of the fourth sphere touching the rest in R, K, x, z, P, Q; then if the sphere E be supposed to revolve round the line DA, touching the two spheres A and D, the points of contact will describe two parallel circles whose projections R s, K m will pass through the points of contact R and K, and be projected into right lines on the horizontal plane; by the same reason



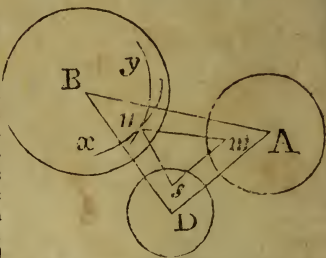
when the sphere revolves about D B and B A the circles described by the points of contact will be projected into right lines, and consequently the intersections of those right lines give the projections of the points of contact (made by the sphere when sustained at rest) upon the plane of the horizon; wherefore the point m, n, s thus found are given, and also the lines A m, D s, B n; now if n, m, s be supposed to represent the points of contact made by the third sphere when sustained by the rest, all the forces sustaining it pass through its center in the directions A m, B n, D s; wherefore, the directions of the forces being given, the forces themselves may be found, by the last problem.

PROPOSITION IV. PROBLEM.

Three spheres being placed on a horizontal plane sustaining a fourth; required the force sustained by each.

Let A, B, D, be the given spheres on the plane of the horizon, then if the fourth sphere be supposed to touch the spheres B and D and to revolve round the line B D, the projection on the plane of the horizon of the circle described by the point touching the sphere B will be an ellipse whose axes and position are determinable from the data;

data; in the same manner the ellipse described in consequence of the revolution of the given sphere about A B is determinable, and therefore the point of their intersection n may be found, and by the same method may the other two projections m and s of the points of contact on the plane of the horizon, be determined: Then if n, m, s be now supposed the real points of contact instead of their projections (as in the last problem) the directions $A m, B n, D s$ will be given, and therefore the pressure against each sphere may be found by prop. 7.

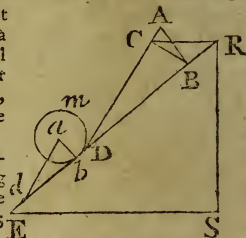


N. B. The 329 question of the Ladies Diary which was proposed in 1750, but not answered in any of the succeeding publications of that work, is a particular case of this problem.

PROPOSITION V. PROBLEM.

If A D and D E are two planes inclined to each other in an angle A D E; it is required to find the point R in the plane E D produced, so that a body descending from R along R E shall acquire the same velocity at E as another body which descends from A down A D, impinges on D E and descends thence down D E to E.

Draw A B perpendicular to E D meeting it in B, draw B C \perp to A D meeting it in C, and draw C R parallel to the horizontal line E F meeting E D in R; then R is the point required.



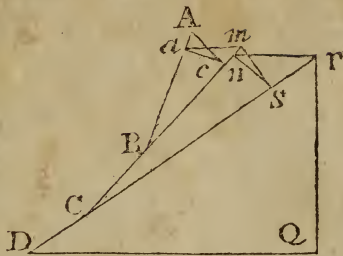
For let $a m b$ be the position of the descending body (which is here supposed a globe) at the instant it impinges on the plane D E, and draw $a d$ parallel to A D and $a b$ perpendicular to D E; then because any force $a d$ may be resolved into the forces $a b$ and $b d$, it is evident that if $a d$ represent the velocity acquired by descending through A D, the instant before it impinges on D E, then $b d$ will represent the velocity with which the body proceeds along the plane D E the instant after the impingement, and these velocities are as $a d$ to $b d$ or A D to D B by similar triangles; but A D is to D B as $\sqrt{A D}$ to $\sqrt{C D}$ and this last ratio is as the velocity acquired by falling through A D to the velocity acquired by falling through C D, or R D, and therefore the velocity acquired by descending through R D is the same as the body has, after descending through A D and impinging on D E; wherefore as their velocities are the same, at D, they will also be so at E, and consequently the velocity acquired by descending from A to E will be the same as by descending from R to E or from R to S.

PROPOSITION

PROPOSITION VI. PROBLEM.

If $AB, BC, CD, \&c.$ be any number of planes given in position, it is required to find the velocity that a body acquires by descending through them all.

Draw An perpendicular on CB produced, and $na \perp$ to AB , and am parallel to the horizon, meeting CB in m ; then draw ms perpendicular to DC produced, and $sc \perp$ to CB , and cr parallel to DQ , meeting DC in r ; then rQ is the height through which a body descending will acquire a velocity equal to that acquired by the body in falling through all the planes.



For the velocity acquired in descending from A to C is equal to that acquired by descending from m to c by the last; and by the same reason, the velocity acquired in falling from m to D is equal to that gained by falling from r to D , or from r to $Q, \&c.$; wherefore the velocity acquired in falling through rQ is equal to that acquired in falling from A to D .

For the velocity acquired in descending from A to C is equal to that acquired by descending from m to c by the last; and by the same reason, the velocity acquired in falling from m to D is equal to that gained by falling from r to D , or from r to $Q, \&c.$; wherefore the velocity acquired in falling through rQ is equal to that acquired in falling from A to D .

Scolium. This proposition hath been generally used by writers of mechanics, to prove that a body acquires the same velocity in descending through a curve as by falling through its perpendicular height; that this conclusion is true, appears by conceiving the above figure to become a curve, for the angles $ABn, \&c.$ being then indefinitely small, the points $A, a, n, m, \&c.$ coincide, and rQ becomes the curve's altitude; but those writers deduce it from two absurd suppositions. *Maclaurin* and *James Gregory*, are, I believe, the only authors that have noticed the mistake; the first in p. 211 of his account of *Newton's* discoveries, and the latter in a small treatise, published at *Glasgow* in 1672, under the name of *Patrick Mathers*, entitled, "*The Great and New Art of Weighing Vanity.*"

New MATHEMATICAL QUESTIONS to be answered in next Year's DIARY.

[41] I. QUESTION, by Mr. George Sanderfon.

If a given chord bisect the diameter of a given circle in D ; to draw a line from one end of the diameter meeting the circle in F and the chord in E so that the ratio of DE to EF may be given.

[42] II. QUESTION, by Mr. T. Barker.

If two given circles be so placed that a given point P divides both their diameters in the same ratio, and S be also another given point; it is required to draw PAB cutting the two circles in A and B so that the angle ASB may be the greatest possible.

[43] III.

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[43] III. QUESTION, by Mr. John Hampshire.

PP is a given circle and CA, CB, are lines, given in position; it is required to find the points in the circumference from whence perpendiculars being let fall on CA, CB shall make the distance of their intersections a given quantity or the least or greatest possible.

[44] IV. QUESTION, by Mr. J. Jackson.

IF PAB be a given triangle, and BM be drawn meeting PA in the given point M; it is required geometrically to draw PSH meeting BM in S, so that ST being drawn parallel to PA meeting BA in T, and TH being drawn parallel to PB meeting PS in H the perimeter of the triangle STH may be either a given quantity or a *minim.*

[45] V. QUESTION, by Mr. John Burrow.

IN any polygonal figure of an odd number of sides, if each two sides containing an angle be produced to meet the side opposite that angle; or if the number of sides be even, and each two sides containing an angle, be produced to meet the two sides containing the opposite angle; then will the sum of all the salient angles of the figure thus generated be equal to two right angles, if the number of sides be odd, but equal to four right angles if the number of sides of the polygon be even.

[46] VI. QUESTION, by Mr. Joseph Edwards.

SUPPOSE a stick three feet long with one end resting on the palm of the hand, and inclined to the horizon in an angle of 60° ; required the time of travelling 100 yards, so that the stick may preserve the same inclination to the plane.

[47] VII. QUESTION, by Mr. Reuben Burrow.

HAVING given two points through which a great circle is to pass; it is required to find the pole of that great circle geometrically, and also to cut off a given arch from it; according to the orthographic projection of the sphere.

[48] VIII. QUESTION, by Mr. Thomas Todd.

REQUIRED the curve into which a hollow cylindrical tube must be bent, so that being revolved about an axis at right angles to the horizon with a given velocity, a globe put in any part of the tube may remain there without ascending or descending.

[49] IX. QUESTION, by the Rev. Mr. Crakelt.

FROM a given point it is required to draw a right line cutting two circles given in magnitude and position so that the parts of the line intercepted by these circles may have a given ratio. *N. B. The 28 Prob. 233 of Simpson's Geometry is a particular case of this; but the general problem admits of a simpler construction than that there given.*

[50] X. QUESTION, by Mr. Thomas Moss.

TO divide a given angle into two such parts that the rectangle contained under the difference of their sines, and the sum of their cosines answering to two given unequal radii, may be of a given magnitude.

[51] XI. PRIZE QUESTION, by Mr. Jeremiah Ainsworth.

A Person undertakes to throw with a pair of common dice, the chance Seven before any other shall come up twice; required the exact probability of doing it?"

N. B. A solution to this Problem hath before been attempted but 'tis apprehended without success.

Whoever gives the best solution to this question before the first of May shall receive a Prize of Twelve Diaries, and the next best a prize of Six Diaries.