

Lecture 13<sup>th</sup>

M. B. ...  
Astronomy

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J. R. B.

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Astronomy is that science which  
<sup>describes</sup>  
~~describes~~ the motions magnitudes  
and distances of the heavenly bodies  
and which investigates <sup>the</sup> laws  
by which these motions are  
regulated. To give some account  
of the present state of Astronomy  
is to be business of this and a sub-  
sequent lecture —

The plan I propose to pursue  
is the following —

1. I shall give a short and  
general description of the Coperni-  
ca or true system of the world

11. Examine the principles on  
which this system is founded  
and show arguments by which  
the truth of it is demonstrable  
— Prove the motion of the Earth

111. Having <sup>established</sup> the true  
system of the world shall then  
proceed to account for a variety  
of different appearances &c.

4. In the last place — Physical  
Astronomy or the laws of Nature  
under one or other of these heads  
may be comprehended every subject  
properly Astronomical

# Table

	Periods	Dist.	Diam.	Comp. Mag.	Can: But Lightly	Probable
	<del>2</del>	<del>Miles</del>	<del>Jh: Miles</del>		<del>years</del>	25 Day
Sun	<del>3</del>	<del>37</del>	900.	10,000,000.	<del>9</del>	<del>4</del>
Mer:	3	37	3.		9.	unknown
Ven.	7	69.	9	$1\frac{1}{2}$	17	23.
Ear:	12	96.	8	$\frac{1}{5}$	23	<del>4</del> 23.56
Mars.	24 <sup>2</sup>	145.	5	$\frac{1}{5}$	35	<del>4</del> 24.40
Jup.	12	495.	94	1000	118	$\frac{1}{28}$ 9.56
Sat:	30	907.	78.	600	216	$\frac{1}{90}$ unknown

Orbits not circular  
 Eccentricity of the earth

Summer in south lat: warmer than  
 in north

Proportional magnitudes  
 cannot be shown on the Orrey  
 Meris sphere

The Universe is by Astronomers  
divided into two parts -  
Solar System - Fixed Stars  
Our Astronomy is chiefly con-  
cerned about the former. All our  
knowledge of the fixed stars may be obtained  
in a few minutes -

Solar System consists of the  
Sun six primary and ten secun-  
dary planets as they are called &  
the comets the number of which  
is as yet uncertain -

To help the imagination and  
prevent a confusion in our Ideas  
Machines of various kinds have

been considered for a while long in  
motions of the system — The most  
celebrated of them is the theory —  
A particular description of which  
is unnecessary —

Mercury — An water wood boat  
on the surface of Mercury —

Shows with so bright and sparkling  
a face that no spots have been  
observed on his surface and that  
the lengths of his Days and nights  
and seasons are unknown —

Eyes: 7 times <sup>less</sup> larger than ours.

Venus Incl: axis  $75^{\circ}$

Jupiter within his figure Zone  
has a great variety in her  
seasons than the earth —

Morning — Evening Star —

Mars, is thought to be obscured  
by a thick gross atmosphere —

has no satellite rather to observe

As Mars our earth and moon

appear as two moons &c —

Jupiter the largest planet  
in the system - Day and night  
together ten hours only -

2 moons they revolve in 2 days  
the fourth in 17 days -

3 moons which very resemble  
some of the satellites of J. moons

Jupiter faint substances  
called belts

Jupiter has no change of seasons

Saturn's ring like a large  
shining arch in the heavens  
- proportion represented in the

Orary -

Plaus of the planets

Mercury - to the <sup>west</sup> east of the sun  
Venus. 2 hours to the east of  
warming star

Mars. 2 3<sup>rd</sup> Day at 7

Jup.<sup>on</sup> 3 hours to the east  
in the evening

Sat. South. S in the evening

Motion of the earth  
Can such a large unwieldy  
body as our earth move  
would not it be either seen  
or felt? —

I answer that there are larger  
bodies in the system which  
move — that it may move  
and we not perceive its motion  
is evident from what happens  
on the earth — In the cabin  
of a ship ~~with~~ no motion is  
perceived — if a machine constructed  
by human art &c —

A Stone thrown upwards  
should fall to the westward  
A Gun fired <sup>along the meridian</sup> south or north  
should miss the mark. —

These arise from a misconcep-  
tion of the laws of motion —

If this is true, it follows that  
a stone dropped from the top  
mast should fall at a greater  
distance from the bottom  
but this is not the case —  
would lead us into the theory  
of Mechanics shall only obser-  
ve in general that &c. —

Other objections from the  
scriptures - The earth rest  
and the sun's motion it is at  
ledge we positively affirm  
in the scriptures

In this we answer in general  
that when we say the sun rises  
and sets or stands still we  
mean the apparent effect not the  
cause - <sup>ge</sup>Thomson's observations  
that Joshua could be had to move  
the motion of the earth be -  
But there is reason to believe  
that sun was not the subject  
of revolutions

that the writers of the scriptures  
laboured under all the prejudices  
and ignorance of the times in which  
they lived. — This is not derogating  
from the character of these men —  
— Great pleasure from our own  
discoveries

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No annual harattes  
condemned afterwards

Direct proofs of the motion

- I. The sun is the fountain of light and heat therefore
- II. This system more simple.
- III. Small body should move round a greater — Earth and Moon
- IV. If the Ptolemaic system is true the planets would be seen as frozen &c but the Sun in the center
- V. Phases of the inferior planets
- VI. of the superior planets shown — behind the sun — Retrograde motions of Jupiter Mars and Saturn
- VII. Planets in the true system

sometimes nearer to the Sun  
farther from the earth - larger  
size -

8. Calculations proved from  
this principle -

Copernicus - - 1500

Galileo - - 1610 had no

power provided the telescope  
to the heavens - spots in the

Sun - new arguments for the motion  
of the earth - salute to him -

# Geographical Definitions

That the earth is a globe

- I. — Sailed round —
- II. — Eclipse of the moon
- III. — Top of tall objects come first in view

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Poles <sup>axis</sup> — great circles — lesser circles —

All great circles divide the globe into equal parts and are divided into 360 Degrees —  
Part: Longitude — Zones —  
Climates —