

ASTRONOMY & THE GALILEO AFFAIR

S2

I. KEY THOUGHTS

S3

1. The scientific issue in the Galileo Affair was NOT about a flat earth!

S4

anti-religious individuals in 19th century concocted that myth
debate was between:

Old Science (Geocentricity) vs. New Science (Heliocentricity) → Copernicus & Galileo

Earth at center of universe

Sun at center of universe

γη (*gē*) earth

ἥλιος (*helios*) sun

2. Galileo had a PEACEFUL relationship between Science & Religion

S5

IMPLICITLY he accepted the Metaphysics-Physics Principle & Message-Incident Principle
his hermeneutics were remarkable & ahead of church theologians!

Features:

- Principle of Accommodation
- Incidental Ancient Science in Scripture
- Baconian Hermeneutic → science assists biblical interpretation

3. The Re-cycle Thesis

S6

QUESTION: Is the origins debate today a re-cycling of the Galileo Affair with a different science?

☛ **evolutionary biology** instead of **astronomy**

4. Pattern & Process in Science

S7

Galileo's day (early 1600s):

Pattern (observation) is known → movement of the planets

Process (mechanism) is not known → believed planets were in moving heavenly spheres

☛ Isaac Newton's Theory of Gravity only appears in late 1600s

II. BRIEF HISTORY OF ASTRONOMY

S8

Ancient Greek Astronomy

S9

Basic features:

THE EARTH

- centre of the entire universe (**Geocentricity**)
- spherical
 - curved shadow of earth on face of the moon during an eclipse
 - sightings of stars not previously seen as they travelled south
- immovable
 - they did not feel the movement of earth's rotation
 - they argued objects would be thrown off & birds left behind

THE HEAVENS

S10

- spherical
 - single or multiple spheres
 - last sphere called "the **Firmament**"
- motion of the spheres caused movement of the stars
- Two Types of Stars
 - (1) Fixed Stars
 - attached to the Firmament & they move together in unison as Firmament moves
 - (2) Wandering Stars (Planets)
 - travelled on their own path

S11

Retrograde Motion

S12 H13

DEF: a brief east-to-west loop by a planet from its normal west-to-east
movement across the sky
believed to be **real** → not a visual effect

EXAMPLES

Plato (427-347 BC/E)	S2 H22
single heavenly sphere rotates daily	
Aristotle (384-322 BC/E)	S3 H22
multiple heavenly spheres & the last sphere (Firmament) rotates daily	
universe features two parts:	
(1) Terrestrial	
sublunar → below the sphere of the moon	
bodies changeable & destructible	
(2) Celestial	
unchangeable & indestructible	
☛ Galileo will challenge this idea	
Claudius Ptolemy (100-170 AD/CE)	S4
<i>Great System of Astronomy</i> (150 AD/CE)	
basically Aristotelean → geocentric with many spheres	
dominant astronomy for the next 1400 years	
Achievement:	
accurate predictions	
offered an explanation for retrograde motion of “wandering stars”	S5 H23
☛ Galileo will challenge Ptolemaic astronomy	
Nicholas Copernicus (1473-1543)	S6
formulated heliocentric astronomy	
• sun is at the of the <u>entire</u> universe	S7 H24
• planets & moon are in their own sphere	
• motion of spheres caused the motion of the planets & moon	
• fixed stars are attached to the firmament (last sphere of the universe)	
• firmament is immovable	
faithful Christian	S8
church cannon (a religious assistant/administrator) for 40 yrs	
had a peaceful relationship between Science & Religion	
Brief Treatise (1514)	S9
written anonymously & given to trusted friends	
made 7 assertions	
1. <u>ASSERTION #3</u>	S10
“All the spheres revolve about the sun as their mid-point, and therefore the	
sun is the center of the universe. ”	E Rosen, <i>Three Copernican Treatises</i> (NY: Dover 1959), 58
<u>COMMENT:</u>	
heliocentricity is NOT our understanding!	
2. <u>ASSERTION #7</u>	S11
“The apparent retrograde and direct motion of the planets arises not from their	
motion but from the earth’s. The motion of the earth alone, therefore, suffices	
to explain so many apparent inequalities in the heavens.”	Ibid, 59
<u>COMMENT:</u>	
retrograde motion is only an appearance → a visual effect	S12 H13

On the Revolutions of the Heavenly Spheres (1543)

S2

Copernicus's most famous book

heliocentricity was rarely taught openly by end of 16th century

if so, as a “hypothesis” and not as description of physical reality

an academic book written in Latin

therefore, no negative reaction from common people

Galileo wrote in Italian → common people drawn into the controversy

3. “The machinery of the world ... has been built for us by the **Best and Most Orderly Workman** of all ... And although I realize that the **conceptions of a philosopher** [ie, natural philosopher or scientist] are placed **beyond the judgment of the crowd** ... it is his loving duty to seek the truth in all things, in so far as **God has granted** that to **human reason**.” S3

N. Copernicus, *On the Revolutions of the Heavenly Spheres*, *Great Books of the Western World*, RM Hutchins, ed (Chicago: Encyclopaedia Britannica, 1543 [1948]), 6, 508

COMMENTS:

S4

- world was designed by God
- reason & science were rooted in God
- Scientific Knowledge Gap between the academics & common people
“conceptions of a philosopher” & “the crowd”

Copernicus Anticipated Theological Criticism

S5

4. “But if perchance there are certain ‘**idle talkers**’ who take it upon themselves to pronounce judgment, although wholly **ignorant of mathematics**, and if by shamelessly **distorting the sense of some passage of Holy Writ** to suit their purpose, they dare to reprehend and to attack my work; they worry me so little that I shall ever scorn their judgments as foolhardy... Mathematics is written for mathematicians; and among them, if I am not mistaken, my labours will be seen to **contribute** something to the ecclesiastical commonwealth [the church], the principate of which Your Holiness [Pope Paul III] now holds.”

Ibid., 509

COMMENTS:

S6

- Scientific Knowledge Gap between the academics & common people
“mathematicians” & those “wholly ignorant of mathematics”
- Hermeneutical debates over New Science
eisegesis → “distorting the sense of some passage of Holy Writ”
- Science a contribution to the church
dedicated *Revolutions* to Pope Paul III

Example of a Critic: Martin Luther

S7-8 H13

5. “The **new astronomer** [Copernicus] wants to prove that the Earth goes around [the sun] and not the heavens, the Sun, and the Moon [around the earth] ... The **fool** will turn the whole science of Astronomy upside down. But, as **Holy Writ declares**, it was the Sun and not the Earth which Joshua commanded to stand still [Josh 10:12-13].” S9

M Luther, *Table Talk* (4 Jun 1539), in A. Armitage
World of Copernicus (NY: Signet, 1951), 90

6. “Joshua said to the Lord in the presence of Israel: ‘**O sun, stand still** ... The **sun** **stopped in the middle of the sky** and delayed going down about a full day.’” S10

Josh 10:12-13 **SQ 1** for full passage

COMMENTS:

S2

- Luther accepts **SCIENTIFIC CONCORDISM**
“But, as Holy Writ declares, it was the Sun ...”

Luther’s geocentrism:

based on a literalist & concordism reading of the Bible

- classic example that Scientific Concordism **FAILS** S3 H13
the Bible should not be used as a book of science

CONCLUSION: Brief History of Astronomy

S4

1. ALL astronomers accepted the earth is spherical in 1600s

Galileo Affair is not about a flat earth!

2. Scientific Knowledge Gap growing between the academics & common people S5
3. Hermeneutical debates beginning to emerge because of heliocentrism S6

III. BRIEF HISTORY OF GALILEO GALILEI (1564-1642)

S7

Preamble

S8

volatile time & volatile personality → a formula for disaster

SOCIAL FACTORS

S9

- Roman Catholicism on the defensive
fresh off the Protestant Reformation
- Works of Aristotle rediscovered in 12th to 13th centuries S10
became the **Science-of-the-Day**
integrated (conflated) into Roman Catholic theology
- Invention of Printing S11
wide distribution after 1500 & public accessibility
1559 Roman Catholic Church establishes the **Roman Index** (prohibited books)

PERSONAL FACTORS

S12

- Galileo: arrogant, sarcastic, quick to anger → many enemies S12
- wrote his books in Italian S13
common people became a factor
- used DIALOGUE style → to protect the author S14
Galileo put the words of opponent professors in mouths of peasants!

1564

S15

born 15 Feb in Pisa, Italy

raised a Roman Catholic

his father Vincenzo was a music theorist & **experimentalist**
in many contentious debates**1581**

S16

studied medicine at U of Pisa, but did not complete program
nicknamed “Wrangler” for his argumentative style**1585**

moved to Florence

studied **physics & math** with tutorimportant scientific advances in 16th century Italy were made outside the universities

1589

S2

became a professor of mathematics at U of Pisa
 mathematicians deemed inferior & suspicious!

Therefore, part of the Galileo Affair is a **Professional Clash**

S3

NATURAL PHILOSOPHERS

Aristotelians
 qualitative
 based on Aristotle's works
 DEDUCTIVE

MATHEMATICIANS

Galileo
 quantitative
 based on experiments
 INDUCTIVE

Aristotle's Categories

S4

- coined the term 'category'
- categories based on common sense perceptions of daily life
- 'quantity' was only 1 of his 10 categories:
 - quantity**, quality, substance, relation, place, time, posture, having, action, being acted on

1590 *On Motion*

S5

THESIS: **motion & math** are the key to science
 attacks Aristotle's common sense views
 EG

speed of falling bodies proportional to weight (ie, heavier objects fall faster)

☛ ARISTOTLE WRONG → theme throughout Galileo's career

Famous Experiment

dropping cannon balls off Tower of Pisa is probably not true

1592

S6

became a math professor at U of Padua

1597

admits he had long ago accepted Copernican Astronomy

1604

Supernova (exploding star)

Aristotle → celestial realm doesn't change

a comet is friction between air & lunar sphere

Galileo → new star

☛ ARISTOTLE WRONG

gives 3 PUBLIC lectures

1608

S7

telescope was invented by Hans Lippershey

1609

Galileo made his own telescope & pointed it to the heavens:

S8

- moon was not a perfect sphere and has valleys & mountains

Aristotle: heavens were perfect spheres

- moving spots on sun

Aristotle: heavens do not change

- four moons of Jupiter

Aristotle: all heavenly bodies revolve around the earth

- phases of Venus indicated that Venus & the earth revolve around sun

S9 H24

Aristotle: earth was the centre of the universe

☛ ARISTOTLE WRONG

S10

1610 *Starry Messenger*

S2

THESIS: telescope findings reveal the Aristotelian universe is incorrect

☛ ARISTOTLE WRONG

BUT

ambiguous about heliocentrism

2nd edition made Galileo famous throughout Europe

frenzy of telescope watching

ARISTOTELIAN REACTIONS:

S3

refused to use the telescope

claimed to see nothing

argued flaws in lenses

claimed optical illusions

accused Galileo of fraud

SIMILAR TO ANTI-EVOLUTIONARY ARGUMENTS TODAY?

S4

refuse to study fossils

claim to see no transitional fossils

argue flaws in the fossil record

claim transitional fossils are illusions → diseased creatures

accuse paleontologists of fraud (and even demonic deception!)

Clergy drawn into the debate

S5

pastoral concern emerging:

was Galileo undermining the faith of Christians with his astronomy?

1610

S6

left U of Padua & returned to Florence

became “Philosopher & Mathematician” of the **Grand Duke of Tuscany**

an opportunity to challenge the ideas in the universities

1611

S7

visited **Rome** → very positive

very good dialogue with astronomers at Roman College (Jesuits)

elected to Lincean Academy (scientific society)

had audience with the Pope who was impressed

1612 *Discourse on Floating Bodies*

S8

THESIS: **AUTHORITY** in science is based on **experiments** (Induction)

NOT based on the works of Aristotle (Deduction)

☛ ARISTOTLE WRONG

1613 *Letters on Sunspots*

S9

fully embraces Copernican heliocentric astronomy

Lincean Academy in Rome publishes it

1613

S10

THE BREAKFAST

Grand Duchess Christina asks about theological implications of Galileo’s astronomy:

was Galileo undermining Christian Faith?

Benedetto Castelli informed Galileo

1st response is the “Letter to Castelli” (1613)

later expanded to the “Letter to Grand Duchess” (1615)

- 1615 Roman Catholic church informed that Galileo was interpreting the Bible S2
 ☛ THE PROTESTANT PROBLEM
- 1616 church placed Copernicus' *On the Revolutions* (1543) on the Roman Index S3
 "suspended for correction"
- THE COMMITTEE:
 made up of only theologians & pastors, and they consulted for only a few days
 examined the propositions:
 1. The sun is at the centre of the world & does not move
 2. The earth is not at the centre of the world & is in motion
- THE JUDGMENT S4
 11 to 0 vote
 7. "All said that this proposition [1] is foolish and absurd in philosophy [natural philosophy = science], and formally **heretical** since it **explicitly contradicts** in many places the sense of **Holy Scripture**, according to the **literal meaning** of the words and according to the **common interpretation & understanding** of the Holy Fathers and the doctors of theology ...
 All said that this proposition [2] receives the same judgment in philosophy S5
 and that in regard to theological truth it is at least **erroneous in faith.**"
- M.A. Finocchiaro, ed/trans, *The Galileo Affair: A Documentary History*
 (Berkeley, CA: U of California Press, 1989), 146
- COMMENT: S6
 ☛ church was entrenched in SCIENTIFIC CONCORDISM
 hermeneutics was a significant factor in the Galileo Affair
- Galileo summoned to Rome S7
 Cardinal Robert Bellarmine:
 warned Galileo against the REALISM of heliocentrism
 asked him to call it a HYPOTHESIS
 Bellarmine was correct → no experimental evidence the earth moved
 only appears in 1838 with stellar parallax
- 1618 S8
 3 comets appear
 Jesuits of Roman College publish a book on comets
 they used an Aristotelean interpretation
 comets not celestial, but sparks between air & lunar sphere
- 1623 *The Assayer* S9
 Galileo's work on comets
 attacks Jesuits & alienates them → in the end they'll get Galileo!
- 1624 S10
 Galileo visited Rome & met with Pope Urban VIII
 this Pope was a friend of Galileo's
 encouraged to write up his views as **HYPOTHESIS**
 worked on book between 1624 and 1630
 argued that tides are evidence of the earth's motion

- 1631 Galileo receives the *Imprimatur* for his book → church's seal of approval S2
- 1632 ***Dialogue on the Two Chief World Systems: Ptolemaic & Copernican*** S3
February
 Galileo's most famous book
 PROOF the earth moves → tides
 used the dialogue style
 Jesuits convinced Pope Urban VIII that he is the character named "Simplicio"
 Pope feels betrayed & never talks to Galileo again
- August S4
 the church stopped distribution of the book
 committee was formed to examine it
- October
 Galileo called to Rome
- 1633 S5
June 16
 recommendations of committee:
 • Galileo publicly recant his views
 • Galileo put under house arrest
 • *Dialogue* to be banned
- June 22 S6
Galileo's Heresy Trial & "Recantation"
 8. "I, Galileo, son of the late Vincenzo Galilei of Florence, seventy years of age ...
 I have been judged vehemently suspected of heresy, namely of having held and
 believed that
 [1] the sun is the center of the world and motionless
 [2] and the earth is not the center and moves ...
 With a sincere heart and unfeigned faith I abjure, curse, and detest the aforesaid
 errors and heresies."
Galileo Affair, 292
- COMMENTS: S7
 regrettable, but somewhat understandable
 Galileo was 70 yrs old & sick → wants to get home
 BUT
 Galileo becomes the SYMBOL of the WARFARE relationship
 of Science & Religion
- December S8
 returned to Florence & was under house arrest for rest of his life
 NOT in a dungeon & in chains!!!
 continued scientific work & focussed on motion
- 1637 S9
 abandoned his theory that tides are proof the earth moves
- 1638 ***Discourses & Mathematical Demonstration Concerning Two New Sciences*** S10
 ☛ ARISTOTLE WRONG again!!!
- 1642 S11
 dies January 8 & was buried in Florence, Italy

Epilogue

S2

1687Newton describes Theory of Gravity in *Mathematical Principles* (1687)

NB

Galileo did not have the concept of gravity in his science

1835Roman Catholic church removed *Dialogue* from the Roman Index**1838**

stellar parallax confirms earth that moves

CONCLUSION: Brief History of Galileo Galilei

S3

1. The Galileo Affair much more complex than simple Science & Religion Warfare

S4

numerous contributing factors:

• Social

Roman Catholicism still reacting to the Protestant Reformation

• Personal

Galileo's bad attitude

• Professional

Aristotelians (Old Science) vs Mathematicians (New Science)

• Theological

Church was steeped in scientific concordism

Aristotle was conflated into Roman Catholic theology

S5

• Scientific

Geocentricity vs. Heliocentricity

• Knowledge Gap

between growing academic knowledge vs. common knowledge

2. History of Scientific Discovery

S6

1st a pattern (observation) is discovered, 2nd a process (mechanism) is discovered

Pattern: 1543 Copernicus & heliocentricity

Process: 1687 Newton & Theory of Gravity

Parallel to Evolutionary Biology?

S7

Pattern: 1800s fossil record

Process: today just beginning to be understood through genetics

3. Hermeneutics (poor) played a significant part in the Galileo Affair

S8

Lesson for Today:

IF we are going to be involved in the origins debate,

THEN we need to have competent hermeneutics of Genesis 1-11

☛ let's not repeat the hermeneutical errors of the church in Galileo's day

IV. GALILEO'S HERMENEUTICS AND SCIENCE & RELIGION RELATIONSHIP S2

Background: 1613 a breakfast & 2 hr discussion afterward S3

Grand Duchess Christina asks about theological implications of Galileo's astronomy:
was Galileo undermining Christian Faith?

Galileo responded with "Letter to Castelli" (1613)
expanded into "Letter to Grand Duchess Christina" (1615) S4

1. FOUNDATIONAL PRINCIPLE: THE TWO DIVINE BOOKS S5Scripture & Nature Rooted in the Trinitarian God S6

9. "For the **Holy Scripture** and **nature** derive **equally** from the **Godhead**, the former as the dictation of the Holy Spirit and the latter as the most obedient executrix of God's orders."

COMMENTS:

"Letter to Christina" in Finocchiaro, 93

"Godhead" a term for the Holy Trinity—Father, Son & Holy Spirit
balance between the Two Books → both "derive equally" from God

Scripture & Nature Reveal God S7

10. "God **reveals** himself to us **no less excellently** in [1] the **effects of nature** than in [2] the **sacred words of Scripture**, as **Tertullian** [theologian; 160-220 CE/AD] perhaps meant when he said, 'We postulate that God ought **first** to be known [1] by nature, and afterward further known [2] by doctrine—[1] by nature through his works, [2] by doctrine through official teaching.'" "Christina" 93

COMMENTS:

S8

balance between the Two Books → both equally "excellent"
strong view of Natural Revelation (ID)
☛ start 1st with Nature in order to know God

Priority of Scripture over Nature in Theological Issues S9

11. "I have no doubt at all that, **where human reason cannot reach**, and where consequently one **cannot have a science**, but only opinion and **faith**, it is appropriate piously to conform absolutely to the **literal meaning of Scripture**." "Christina" 104

COMMENTS:

S10

reflects Metaphysics-Physics Principle
theology (metaphysics) is **beyond** science (physics)
accepts the literal meaning of theological statements

Priority of Nature over Scripture in Scientific Issues S11

12. "I think that in disputes about natural phenomena **one must begin NOT** with the authority of scriptural passages, but with sensory experience and necessary demonstrations [science] ... after becoming certain of some physical conclusions, we should use these as **very appropriate aids** to the **correct** interpretation of Scripture." "Christina" 93

COMMENTS:

S12

REJECTS scientific concordism
science contributes to hermeneutics
"very appropriate aids to the correct interpretation of Scripture"
Baconian Hermeneutic (Principle #11) → "creatures are a key to Scriptures"

QUESTION

S13

Is **evolutionary biology** a "very appropriate aid to the correct interpretation" of the Genesis 1 & 2 creation accounts?

2. NATURE: THE BOOK OF GOD'S WORKS

S2

God Created Faithful Laws of Nature

S3

13. Nature is “the most obedient executrix of God’s orders ... Nature is inexorable and immutable, [and] **never** violates the terms of the laws imposed on her.” “Christina” 93

COMMENTS:

implications: God is faithful & not deceptive → we can trust nature & science
nature is not a God-of-the-Gaps world

Science is a Gift from God

S4

14. “I do not think one has to believe that the same God who has given us our senses, language, and intellect would want us to set aside the use of these ... Indeed, **who wants the human mind put to death?** . . . When one is in possession of this [scientific information] it too is a **gift from God.**” “Christina” 94, 96, 105

COMMENTS:

crushes the science vs. religion dichotomy
human epistemology & knowledge rooted in God
☛ science ultimately rooted in God!

QUESTION

S5

Is **evolutionary biology** also a gift from God?

Practice of Science IMPLICITLY Affirmed in Scripture

S6

15. “To prohibit the entire science [astronomy] would be no different than to reject hundreds of statements from the Holy Writ, which teach us how the **glory** and the **greatness** of the supreme God are marvellously seen in all his **works** and by divine grace are **read** in the open **book of the heavens.**” “Christina” 103

COMMENTS:

Two Divine Books Metaphor → “book of the heavens”

strong view of natural revelation (ID)

Ps 19:1 re-written:

“The open book of the heavens declare the glory & greatness of God”

Nature is Intelligible & Written in Language of Mathematics

S7

16. From *The Assayer* (1623) “Philosophy [i.e., natural philosophy, or science] is written in this **grand book**, the universe, which stands continually open to our gaze. But the **book** cannot be understood unless one first learns to comprehend the language and to read the letters in which it is composed. **It is written in the language of mathematics** ... without which it is humanly impossible to understand a single word of it; without these, one wanders about in a dark labyrinth.” S. Drake, *Discoveries & Opinions of Galileo* (NY: Doubleday, 1957), 237-8

COMMENTS:

nature is rational & understandable → strong view of natural revelation (ID)

Albert Einstein:

S8 N15

“The eternal mystery of the world is its comprehensibility.” Q7 N15

BUT

no mystery for Galileo → God wrote the mathematics into nature

QUESTION

S9

What do we need to “first learn” before understanding origins?

geology, palaeontology, genetics, comparative anatomy

Otherwise, will we “wander about in a dark labyrinth”?

3. SCRIPTURE: THE BOOK OF GOD'S WORDS

S2

Scripture is Inerrant, NOT its Interpreters

S3

17. "Holy Scripture can **never lie or err**, and its declarations are **absolutely** and **inviolably true** ... Though the Scripture was **inspired by the Holy Spirit** ... we cannot assert with certainty that **all interpreters speak by divine inspiration** since if this were so then there would be no disagreement among them about the meaning of the same passages ... Holy Scripture can **never lie**, as long as its **true meaning has been grasped**.

"Letter to Castelli" in Finocchiaro, 49, 51; "Christina" 92, 96

COMMENTS:

S4

accepted Doctrine of Biblical Inspiration

"Scripture was inspired by the Holy Spirit"

accepted Doctrine of Biblical Inerrancy

Bible "can never lie or err"

Biblical "declarations" "absolutely & inviolably true"

human interpreters are the problem

☛ we need hermeneutics!

Intention of Scripture is for Salvation, NOT Science

S5

18. "I should believe that the authority of Holy Writ has merely **the aim** of persuading men of those articles and propositions which are necessary for their **SALVATION** and surpass all human reason, and so could not become credible through some other science or any other means except [1] **the mouth of the Holy Spirit** ... If [2] **the first sacred writers** had been thinking of persuading the people about the arrangement and the movements of the heavenly bodies, they would not have treated them **so sparsely**." "Castelli" 51-2

COMMENTS:

S6

Principle of Authorial Intentionality (Principle #10)

Dual authorship of Scripture:

[1] Divine Intention → SALVATION

"mouth of the **Holy Spirit**"

"the aim" of the Bible

[2] Human Intention → NOT SCIENCE

"first sacred writers would not have treated [astronomy] so sparsely"

Science in Scripture is INCIDENTAL

S7

19. The Scripture "speak[s] **incidentally** of the earth, water, sun, or other created thing ... **sciences** [are] discussed in Scripture to a **very minor extent** and with **disconnected statements**; such is precisely the case of **astronomy**, so little of which is contained therein that one does not find there even the names of the planets, except for the sun, the moon, and only once or twice Venus, under the name Morning Star." "Christina" 93-4

COMMENTS:

S8

reflects the Message-Incident Principle

science in Scripture is "incidental"

science only appears to a "very minor extent and with disconnected statements"

QUESTION

S9

does Scripture "speak incidentally" of the origin of the world?

20. “Propositions **dictated by the Holy Spirit** were expressed by the sacred writers in such a way as **to accommodate** the capacities of the very unrefined and undisciplined masses ... in order **not to sow confusion** into the minds of the **common people** and make them more obstinate against dogmas involving **higher mysteries** ... Indeed I shall further say that it was not only **respect** for **popular inability**, but also the **current opinion of those times** ... This doctrine [accommodation] is **so commonplace** and so definite among all theologians that it would be superfluous to present any testimony for it.” Ibid., 92, 106

COMMENTS:

S3

reflects the Message-Incident Principle

science is “current opinion of those times” → science-of-the-day
ancient science**Principle of Accommodation** (Principle #3)

S4

refers to accommodation 8 X in “Letter to Christina”

“so commonplace” in the 17th century

reason for accommodation:

to avoid **pastoral** problems

“in order not to sow confusion into the minds of the common people”

QUESTION:

S5

Why is evolution not in the Bible?

☛ to avoid pastoral problems

4. THE CONFLICT BETWEEN GALILEO & HIS CRITICS

S6

Central cause → poor hermeneutics

QUESTION:

Are the issues similar today with Anti-Evolutionism?

Scientific Concordism is the Root of the Conflict

S7

21. “So the reason they [Galileo’s critics] advance to condemn the opinion of the earth’s mobility and sun’s stability is this: Since in many places in Holy Scripture one reads that the [1] **sun moves** and the [2] **earth stands still**, and since the **Scripture can never lie or err**, it follows as a necessary consequence that the opinion of those who want to assert the [1] sun to be motionless and the [2] earth moving is **erroneous** and **damnable** ... They want to **extend**, not to say abuse, its [ie, the Bible’s] **authority**, so that even for purely **physical** [scientific] **conclusions**, which are not **matters of faith**, one must totally abandon the senses and demonstrative arguments [ie, scientific] in favour of any scriptural passage whose apparent words may contain a different indication.” Ibid, 92, 90

COMMENTS:

S8

Galileo’s critics accepted Scientific Concordism

“authority” of the Bible “extends” to “physical conclusions”

a superficial logic to the argument of the critics:

S9

- The Bible states the “sun moves” & “earth stands still”
- The Bible “never lies or errs”

Therefore:

belief the sun stands still & earth moves is “erroneous & damnable”

BUT critics fail to appreciate Message-Incident Principle:

☛ “physical conclusions ... are not matters of faith”

Recasting Galileo's Words for TODAY:

S2

“So the reason **anti-evolutionists** advance to condemn the opinion of the **evolution of life** is this:

- Since in many places in Holy Scripture one reads that **life was created *de novo*** [quick & complete; Gen 1 & 2], and
- since the Scripture can never lie or err,

[Therefore]:

it follows as a necessary consequence that the opinion of those who want to assert the **evolution of life** is erroneous & damnable.”

QUESTION:

S3

Can you **empathize** with scientific concordists & anti-evolutionists? on the surface this argument is reasonable

BUT

in the end falls short hermeneutically

similar to Galileo's critics, it assumes scientific concordism is a feature of the Bible

Excessive Biblical Literalism

S4

22. “Though the **Scripture cannot err**, nevertheless some of its interpreters and expositors may sometimes err in various ways. One of these would be very serious and **very frequent**, namely to want to limit oneself always to the **literal meaning of the words**.” “Castelli” 49

COMMENTS:

interpreters are the problem, not the Bible

☛ “frequent” error is literalism

TODAY

S5

2004 ABC TV survey: 87% Evangelical Protestants & 51% Roman Catholics accept Gen 1 is literal → Young Earth Creation

Proof-Text “Hermeneutics” aka “Sound-Bite TV Reporting”

S6

23. “They published some writings full of useless discussions and **sprinkled with quotations** from the Holy Scripture, taken from passages which they **do not properly understand** and which they **inappropriately adduce**.” “Christina” 87

TODAY

S7

anti-evolutionists often use the *de novo* creation of living organisms “after their kinds” in Gen 1 to claim that God did not create through evolution

☛ they fail to recognize that *de novo* creation is an ancient science of origins

Misappropriation of Academic Authority

S8

DEF: an expert in one academic discipline acts like an expert in another unrelated discipline

Absolute Prince Analogy

24. “**Officials and experts of theology** should not **arrogate** to themselves the authority to issue decrees in the professions they **neither exercise nor study** [eg, astronomy]; for this would be the same as if an absolute prince, knowing he had unlimited power to issue orders and compel obedience, but being neither a **physician** nor an **architect**, wanted to direct medical treatment and the construction of buildings, resulting in serious **danger to the life** of the unfortunate sick and in the obvious **collapse of structures**.”

“Christina” 100-101

COMMENTS:

S2

theologians are not astronomers!

TODAY

S3

most of the leading anti-evolutionists do not have biology degrees:
law, engineering, history, philosophy, mathematics, astronomy, education,
theology, etc

SUGGESTION

always ask: What type of Doctor?

CONCLUSION: Galileo's Hermeneutics and Science & Religion Relationship

S4

1. Galileo had a peaceful relationship between his astronomy & his Christianity
there was no hint of conflict

2. Galileo believed that science does not deal with religion

S5

**25. "The motion or rest of the earth or the sun are not articles of faith and are
not against morals."**

"Christina" 109

3. Galileo believed that the purpose of Scripture was for worship & salvation

S6

**26. "The primary purpose of the Holy Writ [is] the worship of God and
the salvation of souls."**

"Christina" 93

4. Galileo's hermeneutics reflect the Message-Incident Principle

S7

to summarize his views, he used Cardinal Baronio's hermeneutical aphorism

S8

**27. "The intention of the Holy Spirit is to teach us how one goes to heaven,
and not how heaven goes."**

"Christina" 96

MESSAGE OF FAITH

S9 H5

How to Go to Heaven

"articles of faith" "morals" "worship of God" "salvation of souls" Quotes 25-26

"primary purpose of the Holy Writ" "intention of the Holy Spirit" Q 26-27

INCIDENTAL ANCIENT SCIENCE

S10 H5

How Heaven Goes (astronomy) in the Bible:

appear "incidentally" Q 19

mentioned "sparsely" Q 18

"current opinion of those times" Q 20

"accommodated" to the level of "common people" Q 20

"in order not to sow confusion" Q 20

V. GALILEO'S HERMENEUTICAL GAFFE: LITERALISM & CONCORDISM S2

Despite Galileo's excellent hermeneutics in the "Letter to Christina," he succumbs to literalism and scientific concordism near the end of the letter

☛ moving completely beyond literalism & concordism is difficult!

The firmament is LITERALLY the last sphere in the heavens S3

28. "The word **firmament** [in the Bible] is **literally** very appropriate for the **stellar sphere** [ie, the sphere of fixed stars] and everything above the planetary orbs, which is totally **still and motionless** according to this arrangement [Copernican astronomy]." "Christina" 118

COMMENT: S4 H24

Galileo believed the firmament was the boundary of the physical universe

The sun is LITERALLY in the middle of the heavens S5

29. "With the Copernican system one can very clearly and very easily give a **literal meaning** to another detail which one reads about the same miracle [Josh 10]; that is, that the sun stopped in **the middle of the heavens**." Ibid, 117

COMMENT: S6 H24

Galileo believed the sun was literally in the center of the entire universe

The rotation of the sun LITERALLY turns the spheres of the planets S7

30. "The sun is both the source of light and **THE ORIGIN OF MOTION** [my capitals], and given that God wanted the whole world system to remain motionless for several hours as a result of Joshua's order, it was sufficient to stop the sun, and then **its immobility stopped all the other turnings**, so that the earth as well as the moon and the sun (and all the other planets) remained in the same arrangement; and during that whole time, night did not approach, and the day miraculously got longer." Ibid, 117

COMMENT

- Galileo believed: S8-9 H24
the rotation of the sun caused the movement of the spheres & planets
Therefore: stop the rotation of the sun and it stops the earth's rotation and the sun will not "set"
- Galileo believed:
Josh 10 miracle really happened
☛ personal interventionism

The Problem of Scientific Concordism S10

with the advance of science:

the concordism of one generation is rejected by the next generation
it's like the God-of-the-Gaps

with regard to Galileo's Scientific Concordism: S11

- sun is NOT in middle of heavens
- sun is NOT surrounded by spheres with a planet
- firmament does NOT exist above planets
- sun's rotation does NOT transmit motion to spheres & planets

PASTORAL CONCERN: S12

IF science advances & destroys your scientific concordism,
THEN is your faith in God also destroyed?

VI. THE “APOLOGY TO GALILEO”

S2

Pope John Paul II “Lessons of the Galileo Case” (1992)

The Problem

S3

hermeneutical **incompetence** of 17th century theologians of the Church

31. “The new science [Copernican astronomy] ... obliged **theologians** to examine their own criteria of scriptural interpretation. **Most of them did not know how to do so ...** The **majority of theologians** did not realize the formal distinction between [1] Sacred Scripture and [2] its interpretation, and this led them unduly to **transpose** [conflate] into the realm of the **doctrine of the faith** a question that in fact pertained to **scientific investigation**.”

JP II, “Lessons of the Galileo Case,” *Origins: CNS Documentary Service* 22 (1992), 372-373

COMMENTS:

S4

The Bible is NOT the problem → the interpreters are!

Failure to distinguish:

[1] “Sacred Scripture” from

[2] “its interpretation”

Problem of Conflation:

“**transpose** [conflate] into the realm of the doctrine of the **faith** a question that in fact pertained to **scientific** investigation.”

The Tragic Consequence

S5

Galileo has become the SYMBOL of Science & Religion Warfare

32. “The Galileo case has been a sort of ‘**myth**’ in which the image fabricated out of the event was quite far removed from reality ... **This myth** has played a considerable **cultural role**. It has helped anchor a number of scientists of good faith in the idea that there was an **incompatibility** between [1] the spirit of **science** and its rules of research on one hand and [2] the **Christian faith** on the other.”

Ibid, 373

COMMENTS:

S6 H1

today this Galileo myth continues to fuel: Science & Religion Warfare
Science vs. Religion Dichotomy

The Problem Re-Stated

S7

Cardinal Paul Poupard

commissioner of 13 yr study that led to the Galileo apology

33. “Galileo’s judges, incapable of dissociating **faith** from an **age-old cosmology**, believed quite **wrongly** that the adoption of the Copernican revolution, was such as to undermine Catholic tradition.”

P. Poupard, “Report” Ibid, 374-5

COMMENTS:

S8

Problem of Conflation17th century theologians conflated “faith” & “age-old cosmology”

The Solution

S9 H5

Message-Incident Principle → **Separate, Don’t Conflate!**

QUESTIONS:

S10-11 H5

Are Christians today:

“incapable of dissociating faith” from an “**age-old biology**”?“incapable of dissociating faith” from an “**age-old biology of human origins**”?

VIII. CONCLUSION: ASTRONOMY & THE GALILEO AFFAIR

S2

1. Galileo did NOT view Science & Religion in a Warfare Relationship

S3

He believed:

S4

- Two Divine Books

God reveals equally well:

(1) “the effects of nature” Quote 10

“book of the heavens” Q 15

“grand book” Q 16

(2) “the sacred words of Scripture” Q 10

- Science was a “gift from God.” Q 14
- Science was a “very appropriate aid to the correct interpretation of Scripture.” Q 12

2. Galileo was a Christian (though far from perfect → but who is?)

S5

He believed:

S6

- The Trinitarian God of Christianity

referred to as the “Godhead” Q 9

- The Bible was inspired by God

“the Scripture was inspired by the Holy Spirit” Q 17

- Biblical Inerrancy

“its [Scripture’s theological] declarations are absolutely and inviolably true” Q 17

“conform absolutely to the literal meaning of Scripture” Q11

- Natural Revelation & Intelligent Design

S7

“the glory & the greatness of the supreme God are marvellously seen in all His works” Q 15

1st stage of knowing God

“God ought first to be known by nature” Q 10

- Divine Action

Cosmological Providentialism in Operations

“nature [was] ... the most obedient executrix of God’s orders” Q 9

Personal Interventionism

Josh 10 stopping of sun miracle Q 29 & 30

3. Galileo had Academic Hermeneutics

S8

Despite his minor hermeneutical gaffe, he rejected scientific concordism

He accepted the hermeneutical principles of:

S9

- Accommodation Q 20
- Authorial Intentionality: Divine & Human Q 18
- Baconian Hermeneutic → Science is a KEY to understanding the Scriptures Q 12
- Message-Incident Principle (Implicit) Q 19, 20, 25-30
- Incidental Ancient Science in Scripture Q 19

S10

4. Lessons from the Galileo Affair for Today

S2

History reveals:

S3

- anti-heliocentrism (anti-Copernicism) rooted in: (1) tradition (Aristotle)
(2) scientific concordism
- scientific concordism → failed
- solution to Science-Religion conflicts → competent hermeneutics

Similarly, TODAY reveals:

S4

- anti-evolutionism rooted in: (1) tradition (87% evangelical Protestants → Young Earth Creation)
(2) scientific concordism
- scientific concordism → will fail
- solution to Sci-Rel conflicts → competent hermeneutics of Gen 1-11

IF Lamoureux were the Pope of evangelical Protestants

S5

- ☛ I would write a letter of apology to all evolutionary scientists

5. Time for a New Symbol for Science & Religion?

S6

Galileo as a symbol of a PEACEFUL relationship between Science & Religion?

S7

Time for a new aphorism?

S8

GALILEO TAUGHT THE 17TH CENTURY CHURCH:

“The intention of the Holy Spirit is to teach us how one goes to heaven,
and not how heaven goes.”

S9

GALILEO COULD TEACH THE 21ST CENTURY CHURCH:

“The intention of the Bible is to teach us **THAT** God is the Creator,
and not **HOW** the Father, Son, and Holy Spirit created.”

D. Lamoureux, *Evolutionary Creation* (2008), 35