Faith, Science, & Reason
Theology on the Cutting Edge

By CHRISTOPHER T. BAGLOW, Ph.D.

Editor: Eric Sammons

MIDWEST THEOLOGICAL FORUM
Downers Grove, IL

Copyright © Midwest Theological Forum
www.theologicalforum.org
TABLE OF CONTENTS

vi How to Use This Presenter's Guide
viii Abbreviations for the Books of the Bible

Part I:
Seeing the Whole:
Natural Science and Supernatural Faith

1 Chapter One:
Faith and Science at the Crossroads
of the Human Spirit

6 Chapter Two:
Science and the Christian Faith:
Understanding and Correcting
Models of Conflict

11 Chapter Three:
The Christian Doctrine of Creation:
A Wisdom Wider than Science

16 Chapter Four:
The First Creation Account and
Modern Science: Uniting Perspectives

23 Chapter Five:
Patroness or Persecutor?
Sacred Tradition and Scientific Discovery

30 Chapter Six:
Evil, Prayer, and Miracles:
Questions for God in the Light of
Modern Science

36 Chapter Seven:
The Twist in the Tale: Modern
Science Versus Scientific Atheism

43 Chapter Eight:
Going “Deeper than Darwin”:
God and Biological Evolution

50 Chapter Nine:
The Emergence of the Image:
God and the Sciences of Human Origins

Part II:
The Mind of the Maker:
Physics, Biology, and Human Origins

56 Chapter Ten:
In His Image: The Human Person
from the Divine Perspective

61 Chapter Eleven:
Human Sin and Modern Science:
The Tragic History of the Image of God

67 Chapter Twelve:
From Evolution to Resurrection:
Jesus Christ, the True Origin of Humanity

72 Tests

119 Art Credits

120 Welcome to Your First Session
(For Distribution to Participants)
You have been entrusted with a sacred task: to help your brothers and sisters in Christ learn more about the relationship between science and faith. Whether you are a teacher in a Catholic school, a parish volunteer leading a small faith formation group, or a parent supplementing your own children's education, your task is vital. This Presenter's Guide is intended to assist you in using Faith, Science, & Reason: Theology on the Cutting Edge, Second Edition. More details on page vii.

This Presenter's Guide provides some ideas of activities that you can use to present the most important points in each chapter. We know you can use your experience and creativity to come up with other activities as well.

The Faith, Science, & Reason participant text is written for both high school and college-age students as well as interested adults.

Each chapter is divided into seven main sections:

PREPARING FOR THE SESSION
This section helps you, the presenter, to prepare for the session ahead of time. It has two subsections:

Points to Remember
This subsection summarizes the important points that will be covered in the corresponding chapter in the participant text. It allows you to keep in mind the most important aspects of the chapter for the participants to retain.

Introductory Questions and Answers
These are several questions that the participants should be able to answer by the end of the chapter.

DURING THE SESSION
This section contains material that you can use during the presentation of the chapter materials. It includes five subsections:

Opening Prayer
It is a good practice to begin each class with the Sign of the Cross and a familiar prayer, such as the Our Father or Hail Mary.

Opening Activity
A suggested activity is given that will both review the previous chapter and lead into a discussion about the current chapter.

Presenting the Chapter
This subsection lists the main topics that should be addressed in the chapter, including some suggestions on how to review them.

Main Classroom Activity
This practical activity can be done in the classroom to help the participants more fully understand the concepts presented in the chapter.

Closing Activity
A suggested activity is given to confirm the main points of the chapter.

WRAP-UP
This section allows you to determine if the participants have retained the key points of the chapter. It is broken down into three subsections:

Assessment
This contains suggested activities for the participants in order to evaluate if they have learned the important concepts from the chapter.
Homework
These suggested assignments for the participants can help reinforce the concepts from the chapter.

Preview of the Next Chapter
This preview is a reminder to briefly introduce the next chapter before concluding the current chapter.

VOCABULARY
This reprints the vocabulary terms at the end of the chapter in the participant text for your convenience, and it offers definitions to those terms that are drawn from the text.

STUDY QUESTIONS
This includes the Study Questions at the end of the chapter in the participant text as well as answers.

PRACTICAL EXERCISES
This gives guidance for what answers to expect when you assign Practical Exercises as a class discussion, individual homework, or a group project.

CHAPTER TEST KEY
This key gives the intended answers to the tests in the second half of this Presenter’s Guide.

CHAPTER TESTS
The chapter tests are available to download at www.mtfresources.org/fsr or may be reproduced for distribution.

BEFORE THE FIRST SESSION

Overview of Chapter One
Be sure you and each of the participants have a copy of this book:

Faith, Science, & Reason: Theology on the Cutting Edge
Second Edition
Available from MTF at www.theologicalforum.org

At the time of registration, give each participant a summary of Chapter One and have him or her read Chapter One before the first session.

You might want your registrar to reproduce and distribute page 120 in this guide to the participants.
Chapter One: Faith and Science at the Crossroads of the Human Spirit

PREPARING FOR THE SESSION

The participants should read the chapter before the session if possible.

Points to Remember

Below are the most important points in this chapter to convey to the participants.

1. Faith and science work together to help us understand the world around us.
2. Science answers the “how” questions of life; faith answers the “why” questions.
3. Both the physical universe and the life of faith are orderly, yet with significant intrinsic unpredictability (openness).
4. Paradoxes, both in science and faith, help us to recognize that natural and supernatural realities are complex and not always easily understood.

Introductory Questions and Answers

Use these questions to determine how well the participants have comprehended the chapter, either in the beginning of the session or at the end—or both.

- Why do we need both faith and science to understand the world? Science helps us to answer the “how” questions about the world; faith helps us to answer the “why” questions. Both are needed to understand the world and ourselves.

- How are science and faith related to each other? Science can purify faith/religion from error and superstition, and faith/religion can purify science from idolatry and false absolutes.

- How do faith and science come together in the human spirit? Every person has an innate desire to understand the world and to know the truth. Faith and science work together to discern the deeper truth about the world and its ultimate meaning.

DURING THE SESSION

Opening Prayer

Begin the session with the Sign of the Cross and an opening prayer such as the “Our Father” or the “Hail Mary.”

Opening Activity

1. Preview Chapter 1 by asking a participant to read the quote by St. John Paul II on page 2 of the textbook. Then discuss his metaphor of faith and reason as “two wings.”

2. St. John Paul II said, “Science can purify religion from error and superstition; religion can purify science from idolatry and false absolutes. Each can bring the other into a wider world, a world where both may flourish.” Ask the participants what they believe the former Pope might have meant by this.
Presenting the Chapter

Ideas for presenting the main concepts of this chapter:

1. Many people today believe that science has all the answers. With the participants, come up with at least 5–10 questions about human life that science is not equipped to answer (i.e., “why” questions). Some examples:
   ✦ Does God exist?
   ✦ Why does something exist rather than nothing?
   ✦ Does there exist such a thing as human dignity?
   ✦ Are miracles possible?
   ✦ Do there exist absolute moral standards and laws? (Section A)

2. Discuss with the participants the lives of Friedrich Miescher and St. Ignatius of Loyola. Ask how the lives of both Miescher and St. Ignatius help to illustrate the relational unity of faith and science. (Section B)

3. Ask the participants to imagine a universe that is not orderly. What would that mean? Would it even be possible to live? Examples could include trying to understand how the human body works, inventing technologies, and predicting the weather. (Section C)

4. Ask the participants, “In what ways does God act unpredictably? Is he really unpredictable, or do we just perceive him to be unpredictable sometimes?” (Section D)

5. Paradoxes exist in both the natural and supernatural worlds. Discuss with the participants the differences between these types of paradoxes. For example, many paradoxes in the natural world may one day be understood, whereas some paradoxes in the life of faith (such as the Blessed Trinity) will never be understood completely by humans. (Section E)

Main Classroom Activity

In this chapter the important terms “hypothesis” and “theory” were defined. On the whiteboard/chalkboard create two columns: “Hypothesis” and “Theory.” Read the following statements, and ask the participants to determine whether each one is a hypothesis or a theory:
   ✦ The sun revolves around the earth. [hypothesis]
   ✦ There are canals on the surface of Mars. [hypothesis]
   ✦ The universe is constantly expanding. [theory]
   ✦ The earth is flat. [hypothesis]
   ✦ All objects exert a gravitational force in proportion to their mass. [theory]
   ✦ An object stays in motion unless acted upon by an outside force. [theory]

Note to the participants that each of the hypotheses above were tested and found not to fit the evidence.

Closing Activity

Ask the participants to discuss with one another how they as Catholics ought to think about the relationship between faith and science and why.

WRAP-UP

Assessment

How well have the participants comprehended the chapter content? Here are some suggestions to assess their knowledge.

1. Ask the participants a few of the Study Questions on page 21 of the textbook. (Answers are provided in the next section.)

2. Have the participants define “hypothesis” and “theory.”

3. Ask the participants to explain why miracles are not against faith or science. (Answers should involve an explanation of paradoxes.)
Chapter One: Faith and Science at the Crossroads of the Human Spirit

Homework
1. Assign some or all of the Vocabulary (p. 20).
2. Assign the Study Questions (p. 21).
3. Assign one or more of the Practical Exercises, especially Practical Exercise #3 (p. 22).
4. Assign the next chapter to read.

Preview of Next Chapter
If time permits, have the participants briefly review the introductory questions for Chapter 2, “Science and the Christian Faith: Understanding and Correcting Models of Conflict” (p. 23). Ask the participants to think of potential conflicts between science and faith.

VOCABULARY
This list is reprinted from the textbook (p. 20), with definitions included.

1. **Reason**: The capacity for wisdom, which is based on the ability to think clearly and come to correct answers to specific problems. The intellectual ability to know truth: to comprehend, infer, or think in an orderly way. (p. 2)

2. **Wisdom**: According to Fr. James Brent, “an all-embracing understanding of reality as a whole in light of ultimate causes, especially in light of the end or goal of all things.” (p. 2)

3. **Faith**: An act and disposition of the mind and will marked by the entrustment of one’s whole self to God and the new path of knowing that it makes possible. (p. 3)

4. **Religion**: The practice of faith in prayer, worship, and daily life. (p. 3)

5. **Universe (unum in diversis)**: “A diverse unity”; a complex collection of very different things that are all connected in some real way; the sum total of all beings that are changeable and material. (p. 4)

6. **“How” Questions (Science)**: Approaching the physical universe according to its internal rules and patterns to explain how it works. (p. 5)

7. **“Why” Questions (Theology)**: Approaching the universe according to what the whole system of the universe means. (p. 5)

8. **Scientific Method**: A method of revealing how the universe works by formulating questions, carrying out investigations, analyzing and interpreting data, and constructing explanations. (p. 8)

9. **Hypothesis (Science)**: A proposition set forth as an explanation for the occurrence of some specified group of phenomena. (pp. 8–9)

10. **Theory (Science)**: A hypothesis that survives many challenges and becomes well-tested and well-developed as an explanation of material realities. (p. 9)

11. **Order (Science)**: Predictable patterns in the universe that can be understood and described with laws — laws that can be formulated in mathematical terms. (p. 10)

12. **Physical Determinism**: The belief that the laws of the physical universe and prior events absolutely predetermine everything that happens within the physical universe, including human thoughts, words, and actions. (p. 10)

13. **Openness (Science)**: The characteristic of the universe by which it has significant unpredictability. (p. 10)

14. **Emergence (Science)**: When new entities occur that cannot be explained simply as the sum of their parts and that must be understood by beginning with the whole and working down to the parts. (p. 10)

15. **Obedience of Faith**: A personal adherence of the whole human being to God; an assent of intellect and will to the self-Revelation that God has made through his deeds and words. (p. 11)

16. **Theology**: The study of God and his Revelation using human reason. According to St. Anselm and the Catholic intellectual tradition, it is “faith seeking understanding.” (p. 12)

17. **Order (Theology)**: The lawfulness of the universe — full of patterns that are intelligible — that is based on that fact that the Son is God’s perfect Wisdom. (p. 13)

18. **Logos (Son, Mind)**: The Second Person of the Blessed Trinity, the Son; Greek for “Mind” or “Reason.” (p. 13)

19. **Gospel**: The announcement of salvation through Jesus’ life, Death, and Resurrection. (p. 14)
20. Openness (Theology): The renewal of the earth that is associated with the Third Person of the Blessed Trinity, the Holy Spirit. (p. 14)

21. Holy Spirit (Gift-Love): The Third Person of the Blessed Trinity, associated with what is new and surprising in God’s work in history. (p. 15)

22. Paradox (Natural): A reality, statement, or proposition that to the finite human mind seems self-contradictory or absurd but in reality expresses a scientific truth, e.g., the wave-particle duality of light. (p. 16)

23. Paradox (Supernatural): A reality, statement, or proposition that to the finite human mind seems self-contradictory or absurd but in reality expresses revealed truth, e.g., the mystery of the oneness of God in three Persons. (p. 16)

24. Complementarity (Science): The principle that objects have properties that cannot be observed all at once because of the limitation of our point of view. (p. 17)

STUDY QUESTIONS

Questions are on page 21 of the textbook. Assign the questions as homework to be answered in complete sentences, or ask the participants to list the page numbers where each answer may be found.

1. How did St. John Paul II approach the relationship between faith and reason? Between faith and science? He saw faith and reason as two necessary and harmonious ways to discover truth. He believed faith and science also worked together in the investigation of the universe. (p. 3)

Section A:
2. Formulate another analogy that shows the difference between “how” and “why” explanations. Answers may vary. One example is playing sports: explaining how a game is played is different than why it is played. (p. 5)

Section B:
3. How do the differences between Miescher’s discovery of DNA and St. Ignatius’s discovery at the Cardoner River illustrate the “how/why” distinction? Miescher was focused on finding the truth about cells and nuclei — the “how” cells work. St. Ignatius found wisdom and understanding about “why” we exist at the Cardoner River. (pp. 6–7)

Section C:
4. Consider the descriptions of the universe as both orderly and open, as a balance of “symmetry and surprises.” If the universe was only orderly, or only open, what would that mean for human existence? If the universe were only orderly, then everything would be determined beforehand. If the universe were only open, then we would have no way of knowing how the universe works. (pp. 9–11)

Section D:
5. How do theological order and natural order parallel each other? Through theological order we can know truths about God and how he operates; through natural order we can know truths about the universe and how it operates. (pp. 13–14)

6. Why do we appropriate natural and theological order to the Son-Logos? John 1:3 says that “all things were made through” the Logos, which includes the orderly universe. Moreover, in the life of the Logos, we see the ordered life that we are to live. (p. 13)

7. How do theological openness and natural openness parallel each other? Theological openness shows that God can work in unexpected and new ways in the world; natural openness shows that the universe works at times in unexpected and new ways. (pp. 14–15)

8. Why do we appropriate natural and theological openness to the Holy Spirit (divine Gift-Love)? Through the Holy Spirit God exists in the mode of gift, and gifts are unmerited, unexpected, and unpredictable. (p. 14)

Section E:
9. Is it true that acknowledging paradoxes and mysteries is a flaw of faith, or is it the case that reality is richer than the human mind can fully comprehend? Why or why not? Paradoxes, both natural and supernatural, reflect the reality that we cannot comprehend all of reality. Faith allows us to embrace those paradoxes, realizing that God directs all things. (pp. 16–17)
PRACTICAL EXERCISES

Practical Exercises are on page 22 of the textbook. Discussions or answers should include these elements.

1. Each answer should include the participant’s experiences related to the metaphor of a bird flying with both wings: faith and reason.

2. Each answer should include elements of comparison between scientists’ natural awe and wonder to the religious awe and wonder experienced by St. Ignatius of Loyola.

3. No answer necessary.

CHAPTER TEST KEY

This test is available to download at www.mtfresources.org/fsr, or pages 72–75 may be reproduced for distribution.

I. Vocabulary Matching (2 points each = 30 points)

|------|------|------|------|

II. People Matching (2 points each = 20 points)

|-------|-------|-------|-------|

III. Short Answer (5 points each = 30 points)

Answer these questions in 2–3 sentences.

26. Both faith and science approach questions about the universe and existence. Faith examines the “why” questions and science examines the “how” questions. (pp. 4–5)

27. Theology is "faith seeking understanding," the study of God and his Revelation using human reason in order to understand it more deeply and live in accord with it more fully. (p. 12)


29. Without predictable, consistent orderliness, the human mind would not be able to discern the patterns and intelligibility of the universe. (pp. 9–10)

30. Emergence is the phenomenon by which new entities come to exist that cannot be explained simply as the sum of their parts. This shows that the universe cannot be understood simply at the level of physics or chemistry but that there is unexpected and surprising openness in the universe. This means that the reductionism characteristic of science has significant limitations in its ability to sufficiently explain the nature of the universe and predict its future. (pp. 10–11)

31. Paradoxes help reveal the complexity of the universe and our limitations in understanding. Complementarity shows those limitations by acknowledging properties that cannot all be observed at once. (pp. 16–17)

IV. Essay (20 points)

Answer the following in 2–3 paragraphs.

32. Answers should include the need to answer both “how” and “why” questions — the human person desires knowledge beyond nature to the spirit; Jesus is the “Son-Logos” through whom the universe is ordered. (pp. 4–5, 13–14)
Chapter Two:
SCIENCE AND THE CHRISTIAN FAITH:
UNDERSTANDING AND CORRECTING MODELS OF CONFLICT

PREPARING FOR THE SESSION

The participants should read the chapter before the session if possible.

Points to Remember

Below are the most important points in this chapter to convey to the participants.

1. Science and faith are not in conflict; they instead can and should work in harmony.
2. The idea that science and faith are in conflict arose in the nineteenth century from various developments, including new understandings of science and anti-Catholic bias.
4. Materialism, reductionism, scientism, literalistic creationism, and separationism all unnecessarily divide science and faith.

Introductory Questions and Answers

Use these questions to determine how well the participants have comprehended the chapter, either in the beginning of the session or at the end—or both.

- Why do so many people today think that science and faith are in conflict? When did this rumor of conflict begin? Many people believe they are in conflict due to the “warfare model” of science and faith. This holds that the two have no possibility of harmony because they are mutually exclusive ways of explaining the universe. This idea of a conflict between the two began in the nineteenth century.
- Are there better ways of thinking about the relationship between science and faith? Yes; they can be seen as “friends”: Science can give credibility to faith, and faith can affirm the importance of science.
- What false ideas keep the rumor of conflict alive today? Materialism, reductionism, scientism, and separationism all keep the rumor of conflict alive.

DURING THE SESSION

Opening Prayer

Begin the session with the Sign of the Cross and an opening prayer such as the “Our Father” or the “Hail Mary.”

Opening Activity

1. Preview Chapter 2 by asking a participant to read the quote from Gaudium et Spes on page 23 of the textbook. Then discuss with the participants the qualifications that the document gives to science (“genuinely scientific manner and in accord with moral norms”), and the impact of those qualifications on the modern view of faith and science.
2. Ask the participants to name some examples in popular culture (movies, social media, news) in which faith and science are set up as two opposite—and conflicting—ways of looking at the world.

Presenting the Chapter

Ideas for presenting the main concepts of this chapter:

1. Discuss with the participants the three developments that led to the “warfare model” between faith and science (pp. 25–27). Ask them to
## CHAPTER ONE TEST

### I. Vocabulary Matching (2 points each = 30 points)

<table>
<thead>
<tr>
<th>A. Wisdom</th>
<th>E. Gospel</th>
<th>I. Hypothesis</th>
<th>M. Openness</th>
</tr>
</thead>
<tbody>
<tr>
<td>B. Theory</td>
<td>F. Reason</td>
<td>J. Universe</td>
<td>N. Theology</td>
</tr>
<tr>
<td>C. Paradox</td>
<td>G. Faith</td>
<td>K. Scientific Method</td>
<td>O. Logos</td>
</tr>
<tr>
<td>D. Order</td>
<td>H. Complementarity</td>
<td>L. Religion</td>
<td></td>
</tr>
</tbody>
</table>

1. Ability to think clearly and come to correct answers about certain kinds of problems; capacity for wisdom. \(p. 2\)
2. Process by which one formulates questions, carries out investigations, analyzes and interprets data, and constructs explanations on this basis. \(p. 8\)
3. Well-tested and well-developed explanation of material realities. \(p. 9\)
4. All-embracing understanding of reality as a whole in light of ultimate causes, especially in light of the end or goal of all things. \(p. 2\)
5. Practice of faith in prayer, worship, and daily life. \(p. 3\)
6. Entrusting of one’s whole self to God and the new path of knowing that it makes possible. \(p. 3\)
7. When faith turns to thinking about what is believed; faith seeking understanding. \(p. 12\)
8. Fact that the universe is characterized by a significant amount of intrinsic unpredictability. \(p. 10\)
9. Situation in which two seemingly irreconcilable assertions are made about a natural phenomenon. \(p. 16\)
10. Explanation to be tested and possibly disproved. \(pp. 8-9\)
11. “Diverse unity”; complex collection of very different things that are all connected in some real way. Sum total of all beings that are changeable and material. \(p. 4\)
12. Principle that objects have properties that cannot be observed all at once because of the limitation of our point of view. \(p. 17\)
13. Predictable patterns in the universe that can be understood and described with laws — laws that can be formulated in mathematical terms. \(p. 9\)
14. Announcement of salvation through Jesus’ life, Death, and Resurrection. \(p. 14\)
15. “Mind” or “Reason”; the Second Person of the Blessed Trinity, the Son. \(p. 13\)
II. People Matching (2 points each = 20 points)

A. St. John Paul II  
B. St. Ignatius of Loyola  
C. St. Anselm of Canterbury  
D. Albert Einstein  
E. Friedrich Miescher  
F. Murray Gell-Mann  
G. Francesco Grimaldi  
H. Neils Bohr  
I. Gregor Mendel  
J. Sir Isaac Newton

16. Founder of the Jesuits who had a religious experience at the river Cardoner in which he was able to see the world in a new way, with a new understanding. (p. 7)

17. Medieval bishop and theologian who said theology is “faith seeking understanding.” (p. 12)

18. Physicist who introduced the scientific principle of complementarity. (p. 17)

19. Pope who wrote that faith and reason are “like two wings on which the human spirit rises to the contemplation of truth.” (p. 2)

20. Physicist who accurately predicted the existence of a subatomic particle based upon a sense of order and beauty. (p. 9)

21. Nineteenth-century pioneer in the field of cell biology. (p. 6)

22. Augustinian monk who discovered the laws of genetics. (p. 9)

23. Jesuit priest who discovered diffraction. (p. 16)

24. English scientist who discovered the law of gravity. (p. 9)

25. Twentieth-century scientist who demonstrated that light is a “wavelike particle” called a photon. (p. 16)

III. Short Answer (5 points each = 30 points)

Answer these questions in 2–3 sentences.

26. How are faith and science alike? How are they different?

27. If we have faith, why is theology still necessary?