

Science before Science Study Group

Week Six

Review Questions - Memorize

- What is a physical thing?

A physical thing is something and can become something else

- Physical things have two parts – what are they?

Matter and form.

- What is matter?

Matter is what it is potentially

- What is form?

Form is what a thing is actually

- What are the two kinds of changes?

A change of substance and a change of accident (property)

Review Questions - Memorize

- What is a substance?

A substance is something that has its own existence. (e.g. a cat, a man, a tree, etc.)

- What is a property or accident?

A property or accident is something that exists in a substance. (e.g. color, texture, hotness or coldness, shape, impetus)

- What is the mnemonic for remembering the nine properties of physical things ?

The nine properties of physical things can be remembered using the mnemonic
QQ RARe POET

- What are the nine properties?

The nine properties are quantity, quality, relation, action, reception, place, orientation, environment, time

Review Questions - Memorize

- What is the principle of non-contradiction?

The principle of non-contradiction is:

Something cannot BE and NOT BE at the same time and in the same way

- What is change?

Change is the process of what can be becoming what is

- What is the most important type of change?

The most important type of change is change of place

- Why is change of place the most important type of change?

Change of place is the most important type of change because unless something can move, things cannot interact with each other

- What is the principle of causality?

The principle of causality is:

Nothing can change itself

- What is impetus?

Impetus is the power or quality of something to move itself.

- What is force?

Force is the quality or power of something to change the impetus of another thing.

Review Questions

- What does plana mean in Latin?

Plana is the Latin word for field.

- Is plana a property or substance?

Plana is a substance.

- Can you identify a property of the plana?

Light is a property of the plana.

Another property of the plana is the gravitational field.

- What are the two parts of the scientific method?

The two parts are (1) it looks at the world through the property of quantity and (2) it make use of symbols and rules to make laws that can make predictions.

- Why is quantity the first property of physical things?

Quantity is the first property because we can think of quantity without all the other properties.

Review Questions

- Empiriometric is another name for what?
Empiriometric is another name for the scientific method
- What does 'empirio' mean?
'Empirio' means the world of the senses
- What does 'metric' mean?
'Metric' means 'as measured'

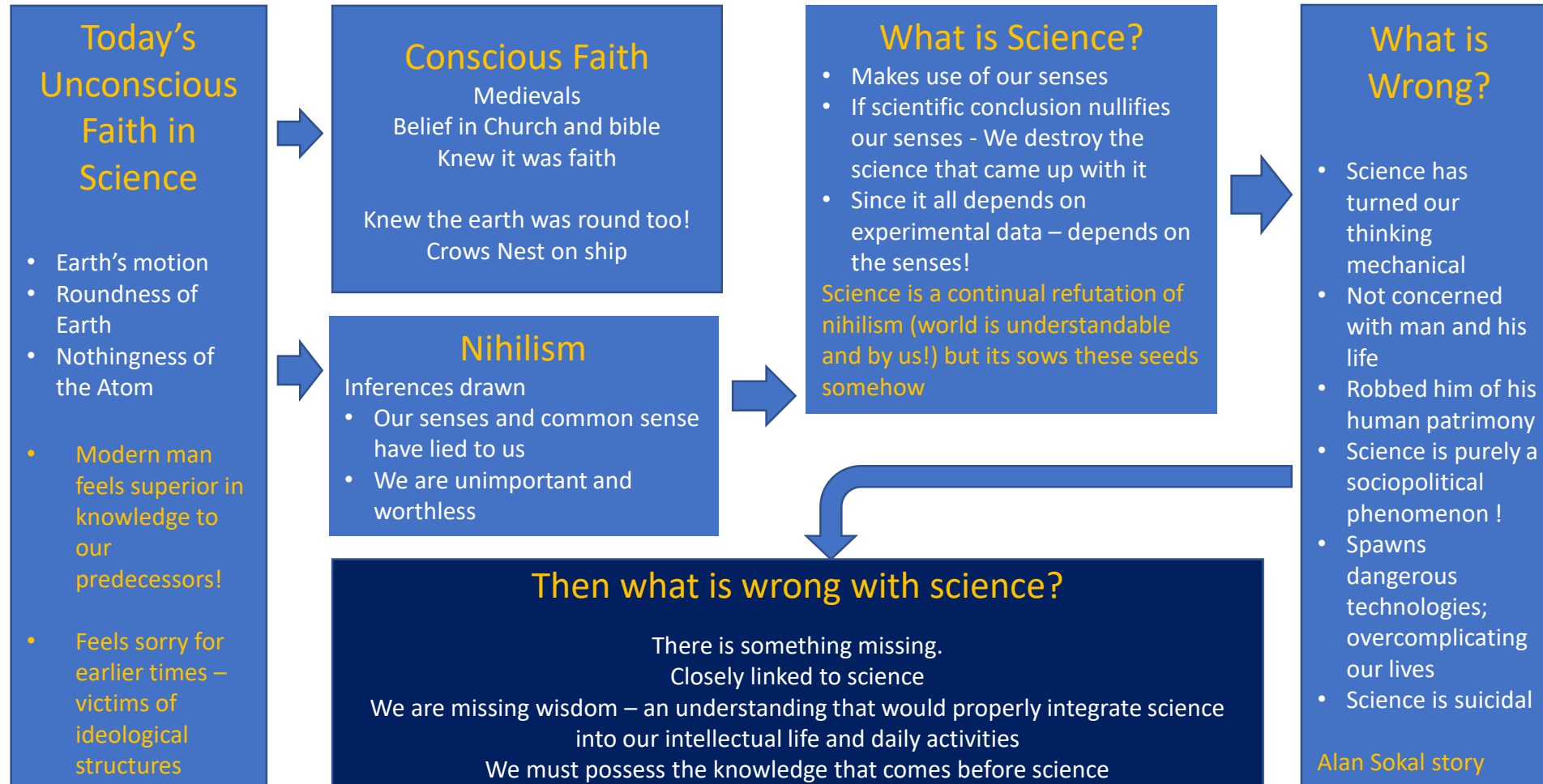
Chapter 2 – A False Sense of Certitude

- Realizing and distinguishing what we know and what we believe!
- Realizing the importance of the authorities we chose!

Science Before Science

- We have unconscious faith
 - What we believe and what we know – are we aware?
- We will look at
 - The earth being in orbit around the sun
 - The roundness of the earth
 - Nothingness of the atom
- Nihilistic element in culture

Chapter 1: Science without Wisdom



Science without Wisdom

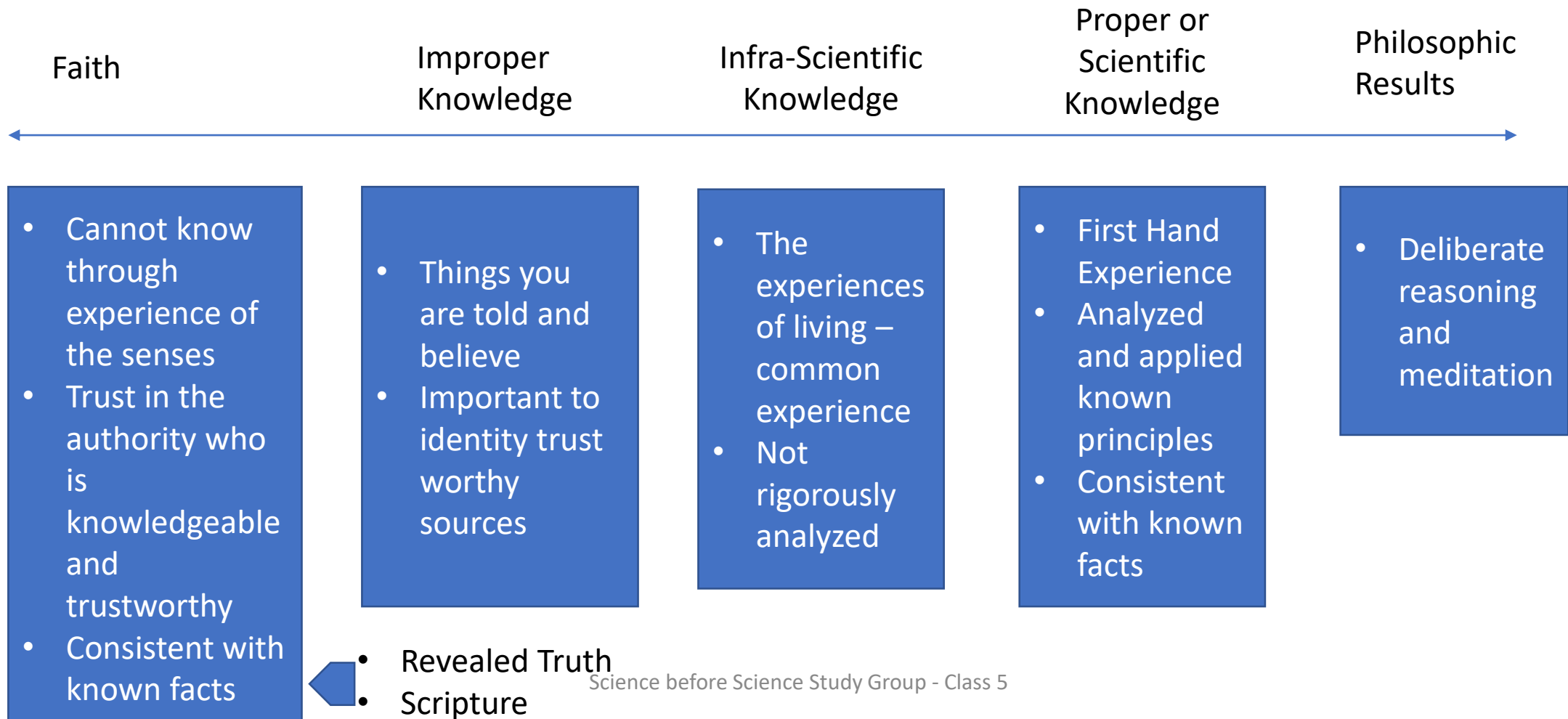
- What is missing?
 - The Science before Science
- What is the science before science?
 - Philosophy – a love of wisdom
- What is the meaning from its Greek?
 - Philo – love of
 - Sophia – wisdom

All men by nature desire to know — Aristotle's *Metaphysica*

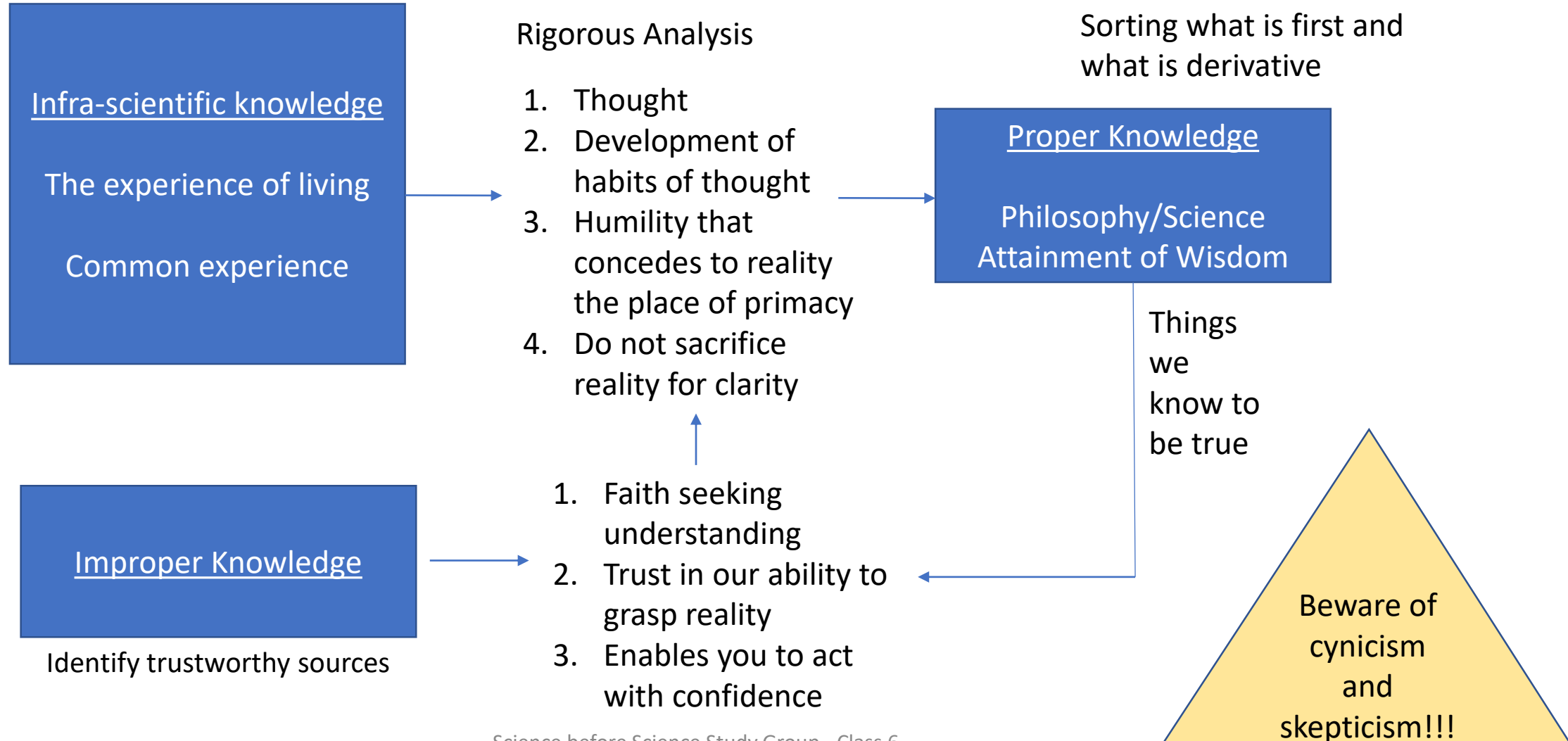
Sense of “before”

- What comes “before” science?
 - Not talking in a historical way
 - Knowledge of a triangle
 - Knowledge of what a side is precedes the concept of triangle
 - Knowledge of side comes “before” knowledge of a triangle
 - Side is “before” the triangle because side is required in the definition

Chapter 2: A False Sense of Certitude



From Blind Belief to Proper Knowledge and Belief



The Earth Revolves around the Sun

- Belief hanging from a chain of beliefs – accept on authority of teacher
 - Do you feel as if the earth's surface is moving at 1,000 miles an hour due to its rotation?
 - Do you feel like the earth is moving 67,000 miles an hour around the sun?
- We use language that indicate how strongly we do not sense any motion of the earth.**
- “It's getting dark, because the sun is going down”
 - Even those with advance scientific education – haven't considered the grounds they believe and say these things – improper knowledge
 - Knowledge of inertia, rotational effects – Coriolis and centripetal forces – too small for us to sense
 - A matter of faith, unconscious faith

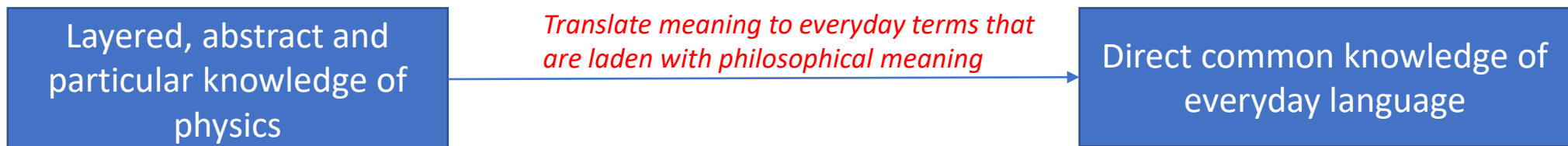
The Roundness of the Earth

- We all believe the earth is round – why?
- Many have not even asked why? – why not?
- How many have done the experiments to verify the shape?
- How many have actually seen the earth from space?
- How many have flown all the way around the earth, watching to verify a continuous heading that would end in a great circle flight around the earth?

Medieval men knew the earth was round – crow's nest

Nothingness of the Atom

- Science without philosophy
 - How to untangle
 - Warranted belief in science from
 - Unwarranted unscientific pseudo-philosophy? We are mostly nothing!
 - Order to our knowledge
 - Immediately known and derived things
 - E.g. book in front of me (primary) and existence of an author (derivative).
 - More certain of the book than the atoms that make up the book
 - Knowledge of atom is a third or fourth level of knowledge
 - Suspended by multiple chains – knowledge conveys up the chains – be careful in moving from link to link



Nothingness of the Atom (continued)

- Modern physics/science never poses the question
 - Is man 10^{28} things or 1 thing?
 - Cannot be both 1 and 10^{28} things – principle of non-contradiction
 - A question for philosophy not modern physics
 - Two planes of explanation interact with each other
 - You are one thing
 - You are 10^{28} atoms
 - Atoms are subsumed into the being of man
 - Reality is multi-layered
 - Reality is heterogeneous not homogeneous

Quiz

Match each item in column A with an item from column B

A	B
Infra-scientific knowledge	Things you are told and believe
Improper knowledge	Analyzed knowledge based on facts and principles
Proper knowledge	Philosophy –study of first principles
Science before science	The experience of living

Important things to remember

- there is an order to our knowledge (primary and derivative)
- we must not sacrifice reality for clarity
- reality is multi-layered
- reality is complicated
- reality must hold place of primacy
- identify trustworthy sources

Chapter 3: First Things First

- Little errors in the beginning cause big errors later on!
- There is an 'is'. Things exist. The real is real!
- Descartes and Kant
 - Start with ideas in the mind – idealism
- We know things exist before we know self and before we know the essence of such things

The Senses

- The senses are the means through which we know everything!
 - Sense of touch is primary – why?
 - Through senses we know the quality of things

The senses are the means through which we know everything

- Common sense – commonality of the senses

Skepticism is (ironically) endemic in our scientific culture

- We have been taught to doubt (at least implicitly)

The Primacy of the Senses

- Items discussed by modern science are not primary
 - The atom is not primary
 - The motion of the earth is not primary
 - The shape of the earth is not primary
- The sense-received fact that things exist is primary!
 - The sensorial data that registers the local flatness of the earth is primary.
 - The sensorial data that registers the relative motion between the earth and the sun is primary

Are the Senses Trustworthy?

- The senses have not given us false information.
 - We have erroneously deduced false information from them.
- Optical examples in text
 - Fechner's wheel
 - TV screen
- One does not blame the senses for not seeing the back of a statue when you've only looked at the front!
- The senses in the end can and must be the instrument through which one finds out about the limitations of the senses

Are the Senses Trustworthy? (continued)

- Remember the senses are that by which we know things
 - Error: that these paradoxes mean our senses are untrustworthy
 - Only a highly refined science can tell you anything of what color really is and if it is real
 - Truth is – the senses provide that information
 - Problem is starting with the paradoxes – with the pathological or perturbed – not the natural state
 - If everyone were blind, the technical and abstract study of light would certainly not exist now. We would have to invent a sort of mythology using things the other sense tell us.
 - Read on p. 38 the blind man!

Wrong thinking!

- Many think that one can go back and second guess the accuracy of sensorial knowledge
 - postulate some system that is logically consistent that completely undermines what the senses have given us
 - Such a thing is impossible!
- Philosophical idealists
 - Pretend not use sensorial knowledge
 - Kant and Descartes
 - Kant thought that one could not know the thing itself.