





RESPECTING THE WEB

by Gilbert Bruce Fargen

25 Feb 2018

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OBJECTIVES

The seventh principle calls on Unitarian-Universalists to affirm and promote:

**“respect for
the interdependent web of all existence
of which we are a part.”**

This talk has two objectives:

1. to review how science describes this web,
2. to explore the ethics of respecting this web.

PRELIMINARIES:

WEB CONCEPTS

BASIC WEB CONCEPTS

- ✘ Every web, including the interdependent web of existence, contains two or more *entities*.
- ✘ Every web contains at least one *relationship* which relates two or more entities.



TYPES & TOKENS

- ✗ Every entity and every relationship is a token of one or more types.
- ✗ Example:

	TOKEN	TYPE
ENTITY	<ul style="list-style-type: none">• Alberta• British Columbia• Manitoba	province
RELATIONSHIP	<ul style="list-style-type: none">• Alberta <u>being east of</u> British Columbia• Manitoba <u>being east of</u> Alberta	being east of

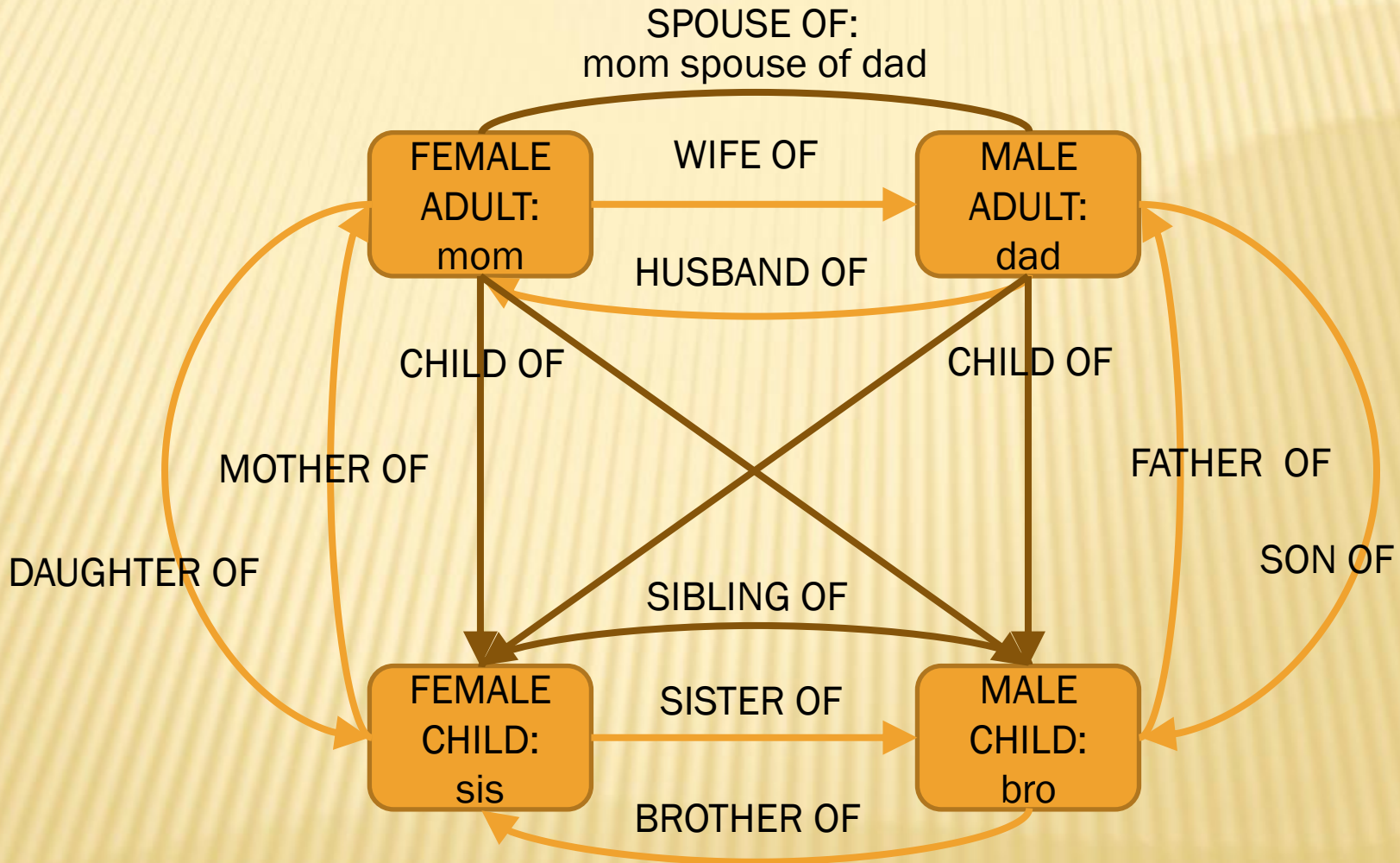
WEB TYPES AND TOKENS

- ✗ In addition to entities and relationships, webs can also have types.
- ✗ The type of a web is fully defined
 - + by the types of entity tokens it contains
and
 - + by the types of relationship tokens it contains.

EXAMPLES: WEB TYPES AND TOKENS

- ✗ There can be numerous webs of the same type.
- ✗ Each individual web is a token of the type.
- ✗ *Example: A human family is a type of web.*
- ✗ *Example: Each individual human family is a token of the human family type of web.*

EXAMPLE: TYPES & TOKENS OF ENTITIES & RELATIONSHIPS



THE FOUNDATIONAL WEB

ATOMS & PROTONS, QUARKS & LEPTONS

- ✘ At one time, science regarded atoms as the foundational particles of matter and recognized numerous types of atoms.
- ✘ Then, we discovered that atoms were actually made up of protons, neutrons and electrons and that the type of an atom was determined by the number of protons it contained.
- ✘ Now, we are told that protons and neutrons are made of even more fundamental particles called “quarks” but that electrons are still a fundamental particles of a type called “leptons”.

FUNDAMENTAL FORCES & BOSONS

At one time it was thought that four forces governed interactions of the fundamental particles.

FORCES

- × Strong Nuclear
- × Weak Nuclear
- × Electromagnetic
- × Gravitational

BOSONS

- × Gluons, Mesons
- × W and Z bosons
- × Photons
- × Gravitons

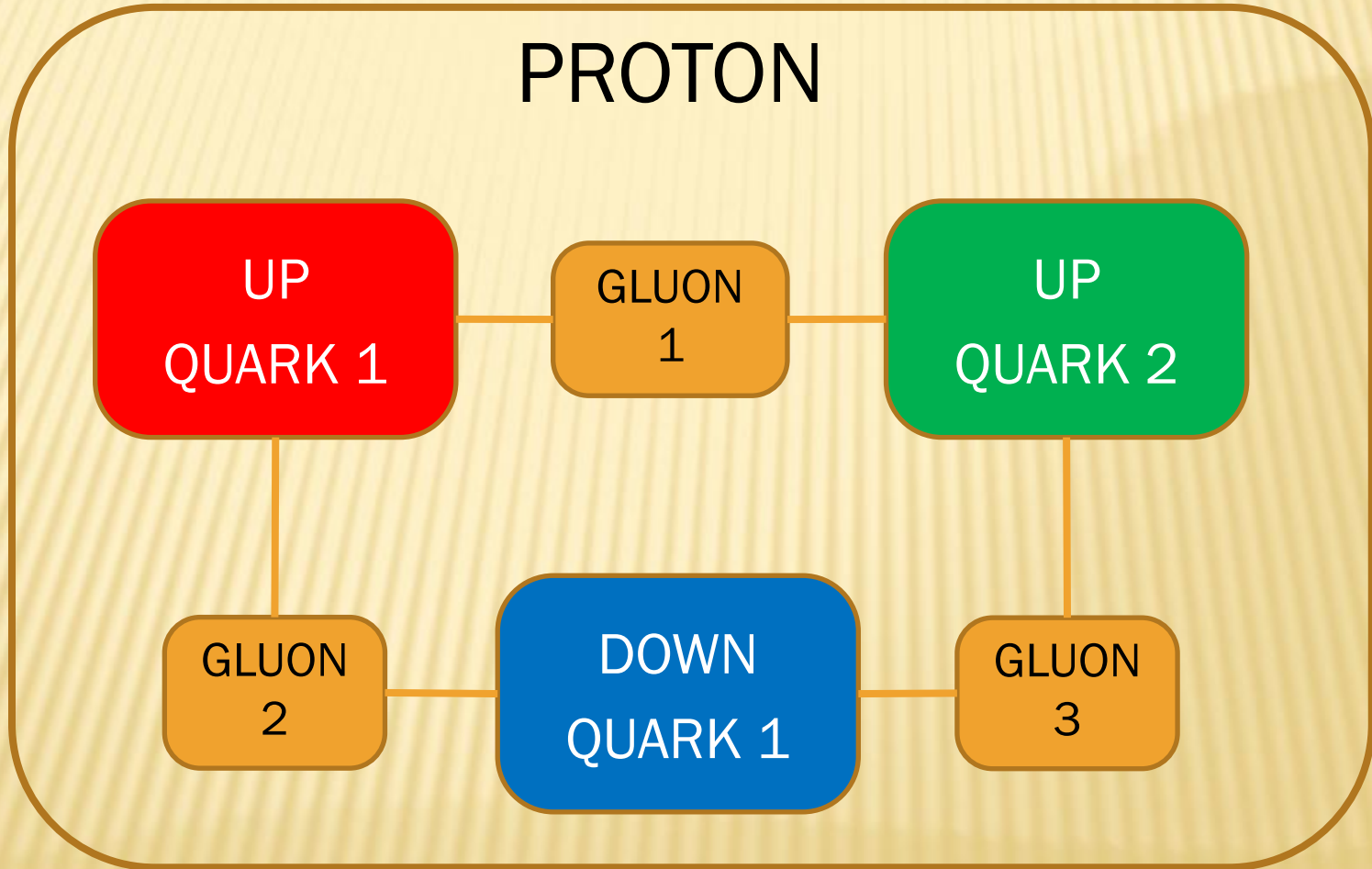
We now believe that the four forces are the result of quarks and leptons exchanging a type of particle called a boson.

QUARKS

		QUARK COLORS		
QUARKS	}	RED	GREEN	BLUE
ANTIQUARKS		ANTI RED	ANTI GREEN	ANTI BLUE

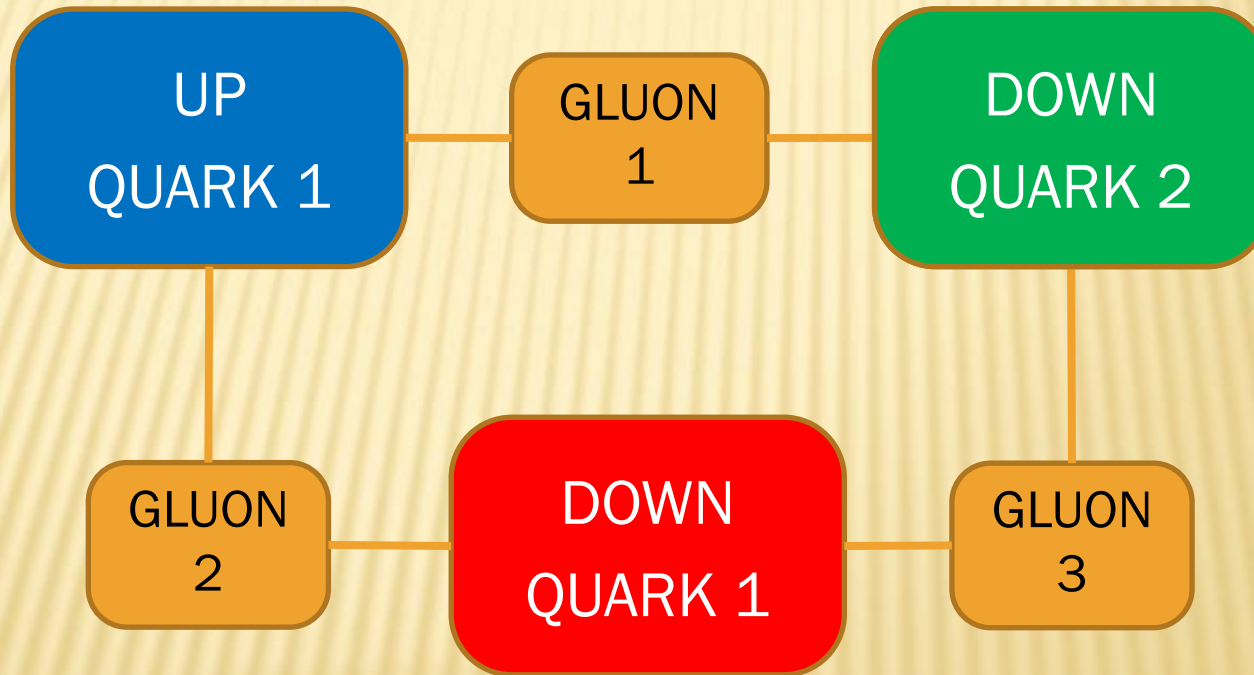
QUARK FLAVORS				
UP	CHARM	TOP	}	QUARKS
DOWN	STRANGE	BOTTOM		
ANTI UP	ANTI CHARM	ANTI TOP	}	ANTIQUARKS
ANTI DOWN	ANTI STRANGE	ANTI BOTTOM		

QUARKS & PROTONS



QUARKS & NEUTRONS

NEUTRON



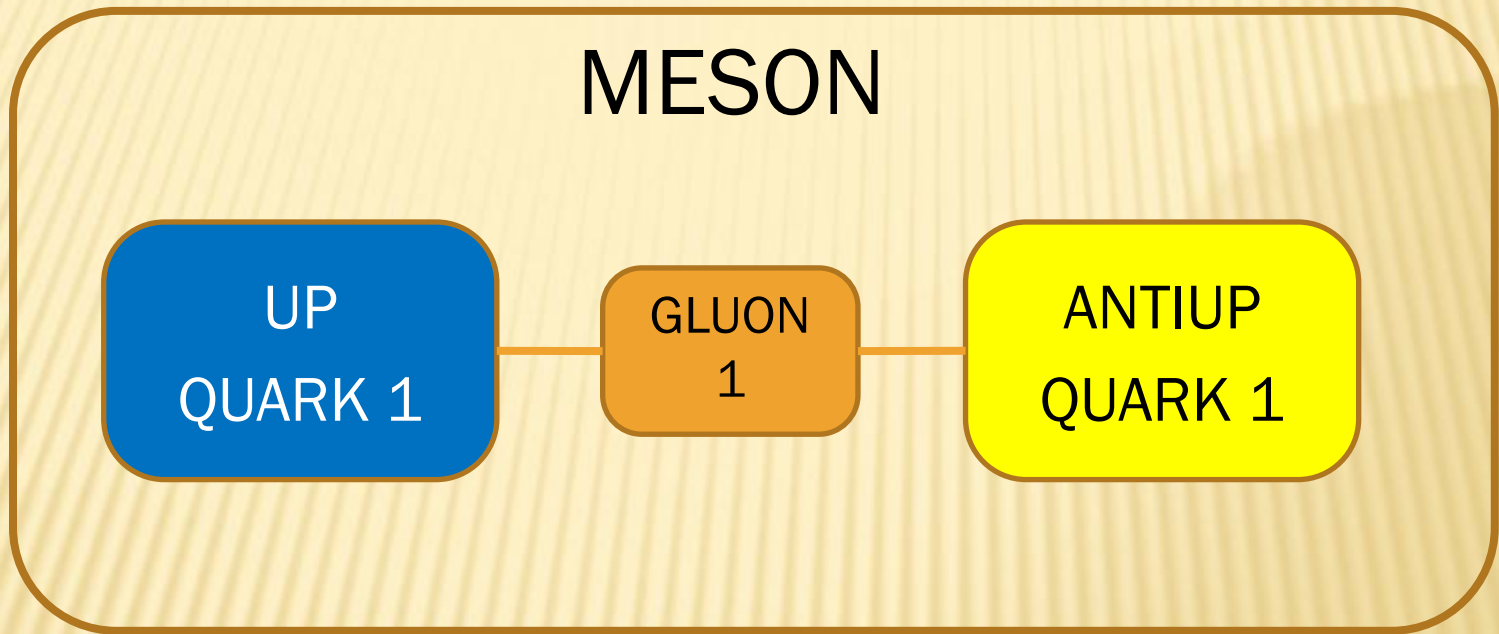
QUARKS & MESONS

MESON

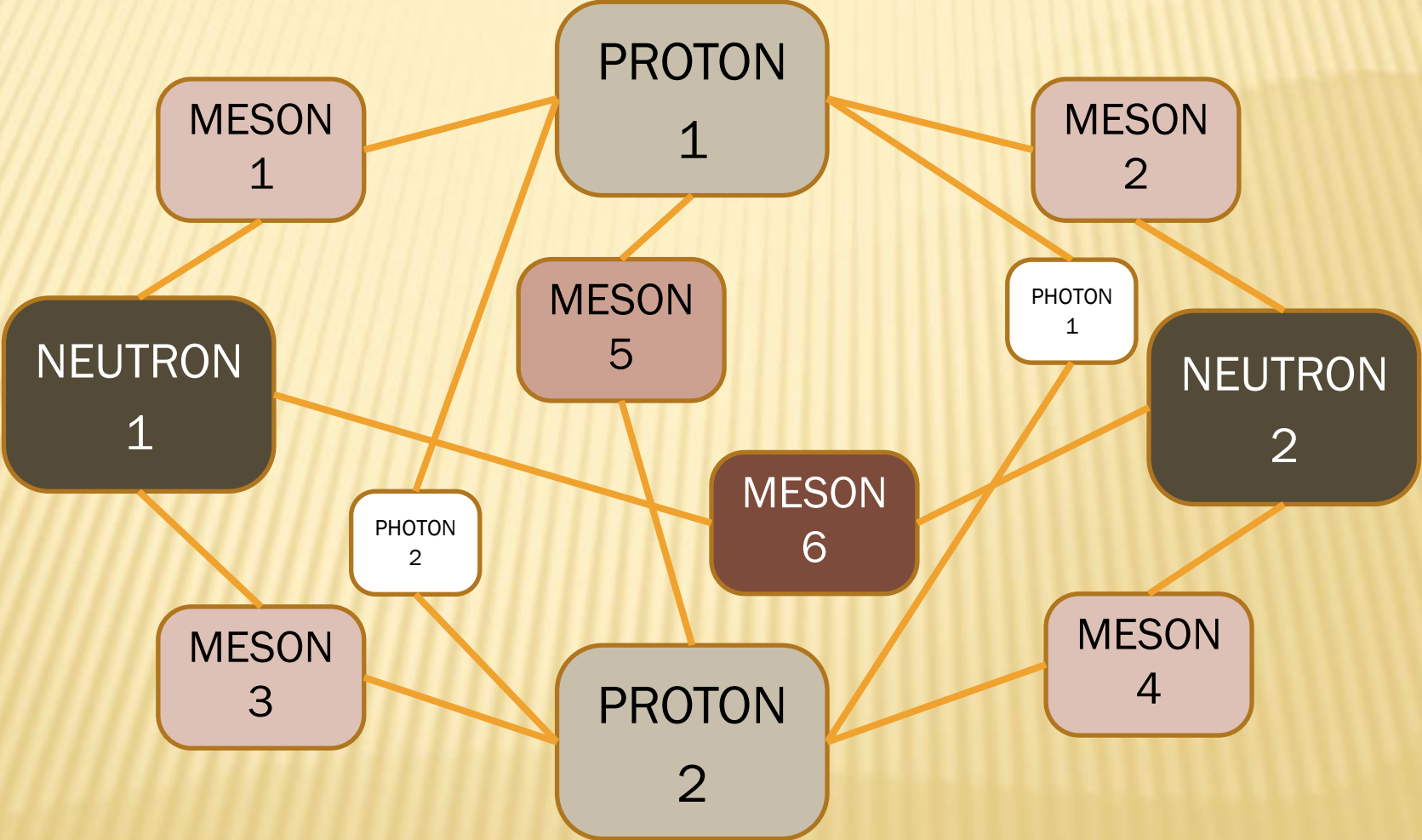
UP
QUARK 1

GLUON
1

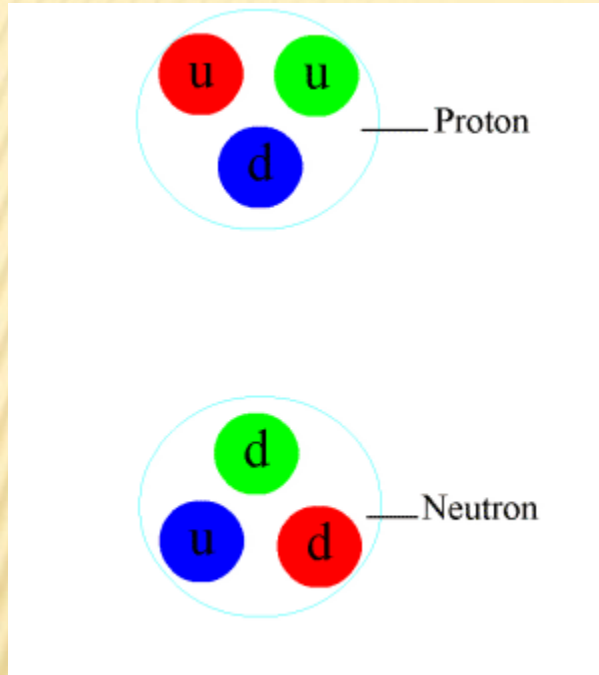
ANTIUP
QUARK 1



PROTONS, NEUTRONS & ATOMIC NUCLEI



THE NEUTRON DANCE



*Animation from
the Wikipedia article
on Nuclear Force*

- ✘ Protons and neutrons are held together by exchanging a pion (a type of meson)
- ✘ Small circles are gluons
- ✘ During the exchange, the gluons change the quarks' color
- ✘ But the color neutrality of the proton and neutron is maintained

PART ONE:

THE SCIENCE OF THE WEBS

THE SCIENCES & THEIR WEBS - 1

SCIENCE

- × physics

WEB

- × solar systems
- × second generation stars
- × first generation stars
- × protons and electrons
- × fermions &
(quarks & leptons)
- bosons
(gluons, mesons, photons,
gravitons)

THE SCIENCES & THEIR WEBS - 2

SCIENCE

- ✘ **planetary sciences**
- ✘ physics

WEB

- ✘ **planetary systems**
- ✘ solar systems
- ✘ second generation stars
- ✘ first generation stars
- ✘ protons and electrons
- ✘ fermions and bosons

THE SCIENCES & THEIR WEBS - 3

SCIENCE

✘ chemistry

- ✘ planetary sciences
- ✘ physics

WEB

✘ organic molecules

✘ inorganic molecules

- ✘ planetary systems
- ✘ solar systems
- ✘ second generation stars
- ✘ first generation stars
- ✘ protons and electrons
- ✘ fermions and bosons

THE SCIENCES & THEIR WEBS - 4

SCIENCE

- × **biology**
- × chemistry
- × planetary sciences
- × physics

WEB

- × **multicellular organisms**
- × **single cellular organisms**
- × **organic replicators (life)**
- × organic molecules
- × Inorganic molecules
- × planetary systems
- × solar systems
- × second generation stars
- × first generation stars
- × protons and electrons
- × fermions and bosons

THE SCIENCES & THEIR WEBS - 5

SCIENCE

- × **physiology**
- × biology
- × chemistry
- × planetary sciences
- × physics

WEB

- × **sensory-motor knowers**
- × **information processing organisms**
- × **differentiated cellular organisms**
- × multicellular organisms
- × single cellular organisms
- × organic replicators (life)
- × organic molecules
- × Inorganic molecules
- × planetary systems
- × solar systems
- × second generation stars
- × first generation stars
- × protons and electrons
- × fermions and bosons

THE SCIENCES & THEIR WEBS - 6

SCIENCE

- × neuroscience
- × physiology

- × biology

- × chemistry

- × planetary sciences
- × physics

WEB

- × **sentients**
- × sensory-motor knowers
- × information processing organisms
- × differentiated cellular organisms
- × multicellular organisms
- × single cellular organisms
- × organic replicators (life)
- × organic molecules
- × Inorganic molecules
- × planetary systems
- × solar systems
- × second generation stars
- × first generation stars
- × protons and electrons
- × fermions and bosons

THE SCIENCES & THEIR WEBS - 7

SCIENCE

- × **psychology**
- × neuroscience
- × biology

- × chemistry

- × planetary sciences
- × physics

WEB

- × **compassionates**
- × sentients
- × sensory-motor knowers
- × information processing organisms
- × differentiated cellular organisms
- × multicellular organisms
- × single cellular organisms
- × organic replicators (life)
- × organic molecules
- × Inorganic molecules
- × planetary systems
- × solar systems
- × second generation stars
- × first generation stars
- × protons and electrons
- × fermions and bosons

THE SCIENCES & THEIR WEBS - 8

SCIENCE

- × **anthropology**
- × psychology
- × neuroscience
- × biology

- × chemistry

- × planetary sciences
- × physics

WEB

- × **symbol & tool users**
- × compassionates
- × sentients
- × sensory-motor knowers
- × information processing organisms
- × differentiated cellular organisms
- × multicellular organisms
- × single cellular organisms
- × organic replicators (life)
- × organic molecules
- × Inorganic molecules
- × planetary systems
- × solar systems
- × second generation stars
- × first generation stars
- × protons and electrons
- × fermions and bosons

THE SCIENCES & THEIR WEBS - 9

SCIENCE

✘ social sciences

✘ anthropology

✘ psychology

✘ neuroscience

✘ biology

✘ chemistry

✘ planetary sciences

✘ physics

WEB

✘ organizations of symbol & tool users

✘ symbol & tool users

✘ compassionates

✘ sentients

✘ sensory-motor knowers

✘ information processing organisms

✘ differentiated cellular organisms

✘ multicellular organisms

✘ single cellular organisms

✘ organic replicators (life)

✘ organic molecules

✘ Inorganic molecules

✘ planetary systems

✘ solar systems

✘ second generation stars

✘ first generation stars

✘ protons and electrons

✘ fermions and bosons

RELATIONSHIPS BETWEEN LEVELS OF WEBS

The webs studied by the various sciences
are related by identifying

a web at a lower level

with

an entity at the next higher level.

EXAMPLE 1: BASE WEBS

WEB	COMPOSED OF
GENE	MOLECULES (amino acids)
MOLECULE	ATOMS + PHOTONS
ATOM	NUCLEUS + ELECTRONS
NUCLEUS	PROTONS, NEUTRONS, MESONS
PROTON	QUARKS + GLUONS

EXAMPLE 2: MIDDLE WEBS

WEB	COMPOSED OF
ORGANISM	ORGANS
ORGAN	CELLS (differentiated)
CELL	CELL NUCLEUS + CELL WALL + CELL BODY + SYMBIONTS
CELL NUCLEUS	CHROMOSOMES
CHROMOSOME	GENES
GENE	MOLECULES (amino acids)

EXAMPLE 3: HIGHER WEBS

WEB	COMPOSED OF
SYMBOL + TOOL USER ORGANIZATIONS	SYMBOL+TOOL USERS + CO-ORDINATED REPRESENTATIONS AND MANIPULATIONS
SYMBOL + TOOL USER	COMPASSIONATE + ABSTRACT REPRESENTATIONS AND MANIPULATIONS
COMPASSIONATE	SENTIENT + REPRESENTATIONS OF OTHERS + COMPASSIONS
SENTIENT	KNOWER + INTERNAL REPRESENTATIONS + APPRECIATIONS
KNOWER	ORGANISM + EXTERNAL REPRESENTATIONS
ORGANISM	ORGANS

**FINDING THE
INTERDEPENDENT WEB OF EXISTENCE**

THE WEB OF EXISTENCE, 1

A problem:

Given that science reveals

a layered set of webs,

which one of science's webs is

the interdependent

Web of Existence,

in the sense of the Seventh UU Principle?

THE WEB OF EXISTENCE, 2

- ✘ The children's version of the Seventh Principle identifies the Web of Existence with the Web of Life.
- ✘ Another option is to identify the Web of Existence with a web which unites all the other webs, a Web of Webs.

A Web of Webs treats entities in higher webs as sets of entities in a lower webs.

THE WEB OF EXISTENCE, 3

But identifying the Web of Existence with the Web of Webs faces another problem:

Where's the interdependence?

For the most part, lower webs are independent of upper webs

And upper webs are dependent on the lower webs.

THE WEB OF EXISTENCE, 4

- ✘ A classic case of interdependence is the relationship between flowering plants and pollinating insects
- ✘ But this interdependence is not general
 - not every pollinator can fertilize every flower
- ✘ Specific flowers may require specific pollinators & specific pollinators require specific flowers.

THE WEB OF EXISTENCE, 5

- ✘ The relationship between **flowering plants and pollinating insects** is one of mutually beneficial interdependence. It is symbiotic.
- ✘ The relationship between **prey and predator** is also one of mutually beneficial interdependence, but unequally distributed within each species and it is not beneficial at all to some individuals within the prey species.
- ✘ Another relationship which is interdependent is that between **parasite and host**, which is beneficial to the parasite but detrimental to the host.
- ✘ Finally, there are relationships like that between **humans and the climate** which are interdependent but detrimental to both and others as well.

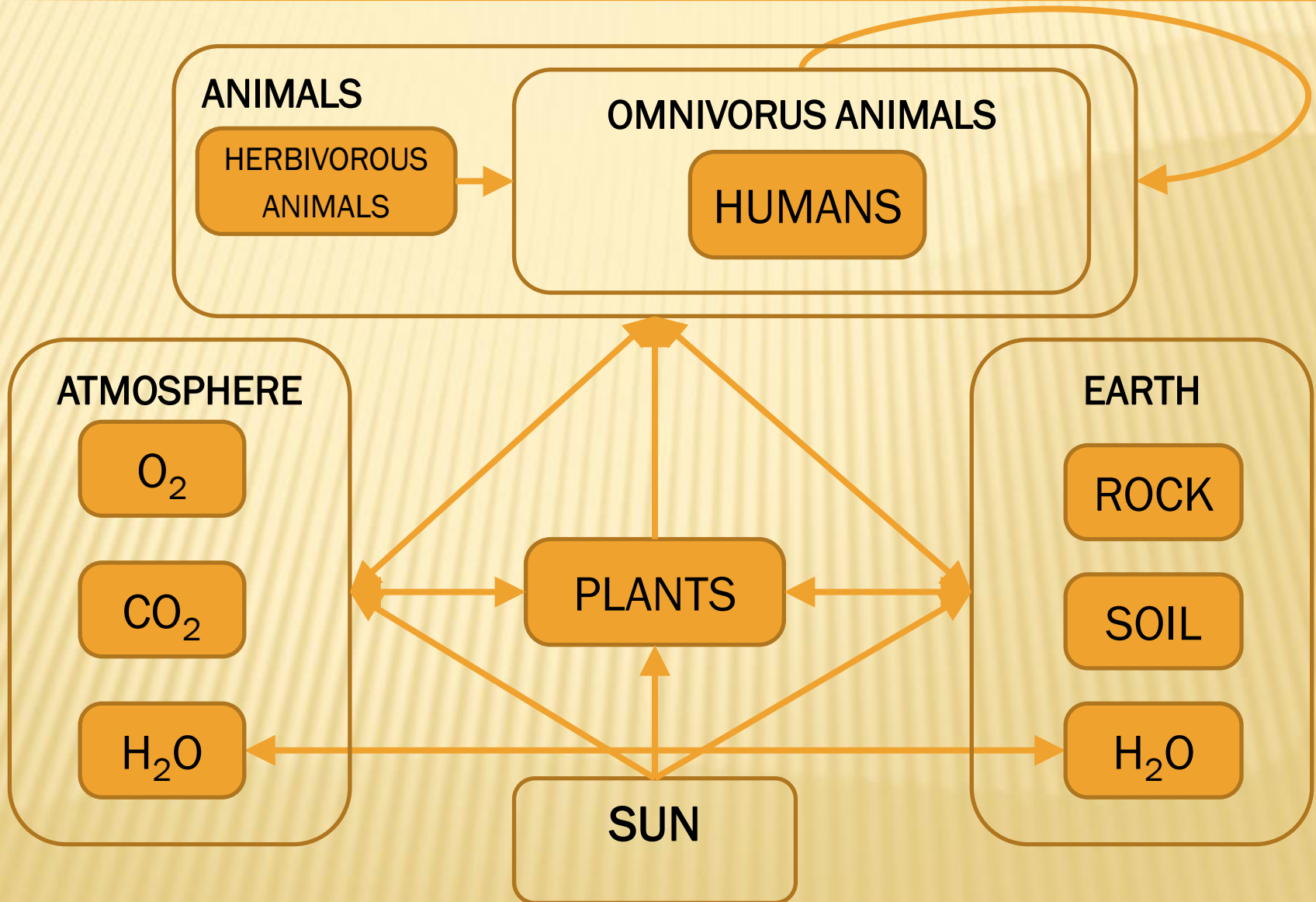
THE WEB OF EXISTENCE, 6

Interdependence

need not imply

Mutual Beneficence

THE WEB OF EXISTENCE, 7



THE WEB OF EXISTENCE, 8

- ✘ This basic picture of the **Web of Life and All that Sustains Life** neglects important webs which exist above.
- ✘ These other webs have an important feature which justifies their inclusion in the **Interdependent Web**.
- ✘ These webs are the **Webs of Intensionality**.

WEBS OF INTENSIONALITY

WEBS OF INTENSIONALITY

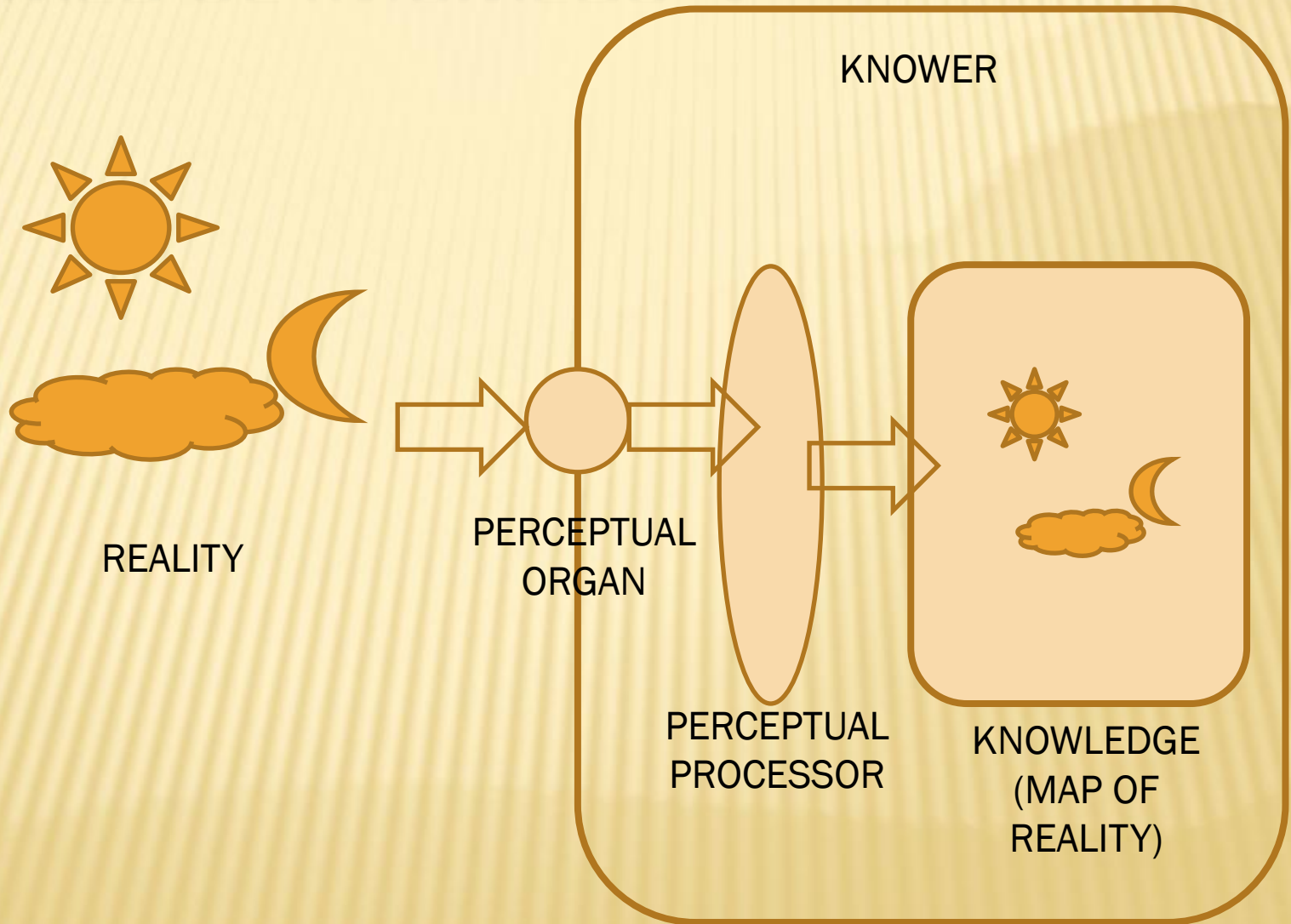
RELATIONSHIPS, EXTENSIONAL & INTENSIONAL

- ✘ In the lower webs, all relationships are extensional, that is, it is simply true or false that they exist.
- ✘ In the higher webs, some relationships are intensional, that is, they exist because they were *created by that web's entities* from a number of possibilities.
- ✘ Example: in the web of humans:
 - + the biological parent relationship is extensional, it is simply true or false that it exists.
 - + The adoptive parent relationship is intensional, it is created by realizing one possibility rather than another.

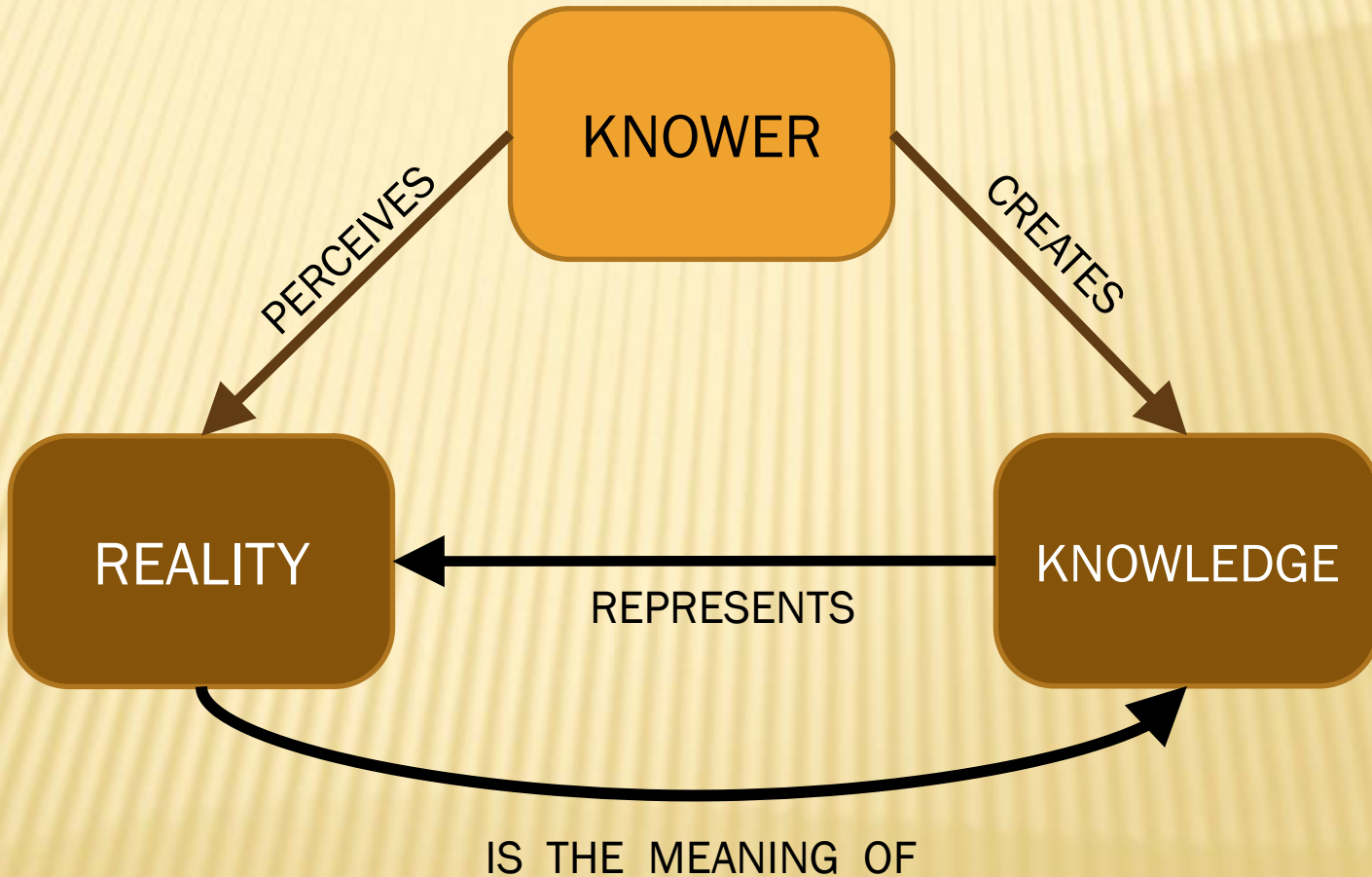
WEBS WITH INTENSIONAL RELATIONSHIPS

WEB	CREATES INTENSIONAL RELATIONSHIPS OF
Symbol & Tool User Organizations	<u>Justice</u> , Civilization, Art, Music, Science, Philosophy & Religion
Symbol & Tool Users	<u>Understanding</u> , Language, Storytelling , Explanatory Theories, Technology,
Compassionates	<u>Compassion</u> , Moral Value, Sense of Others
Sentience	<u>Appreciation</u> , Basic Value, Sense of Self
Knowers	Perceptual <u>Knowledge</u> , Referential <u>Meaning</u> , Kinship Altruism

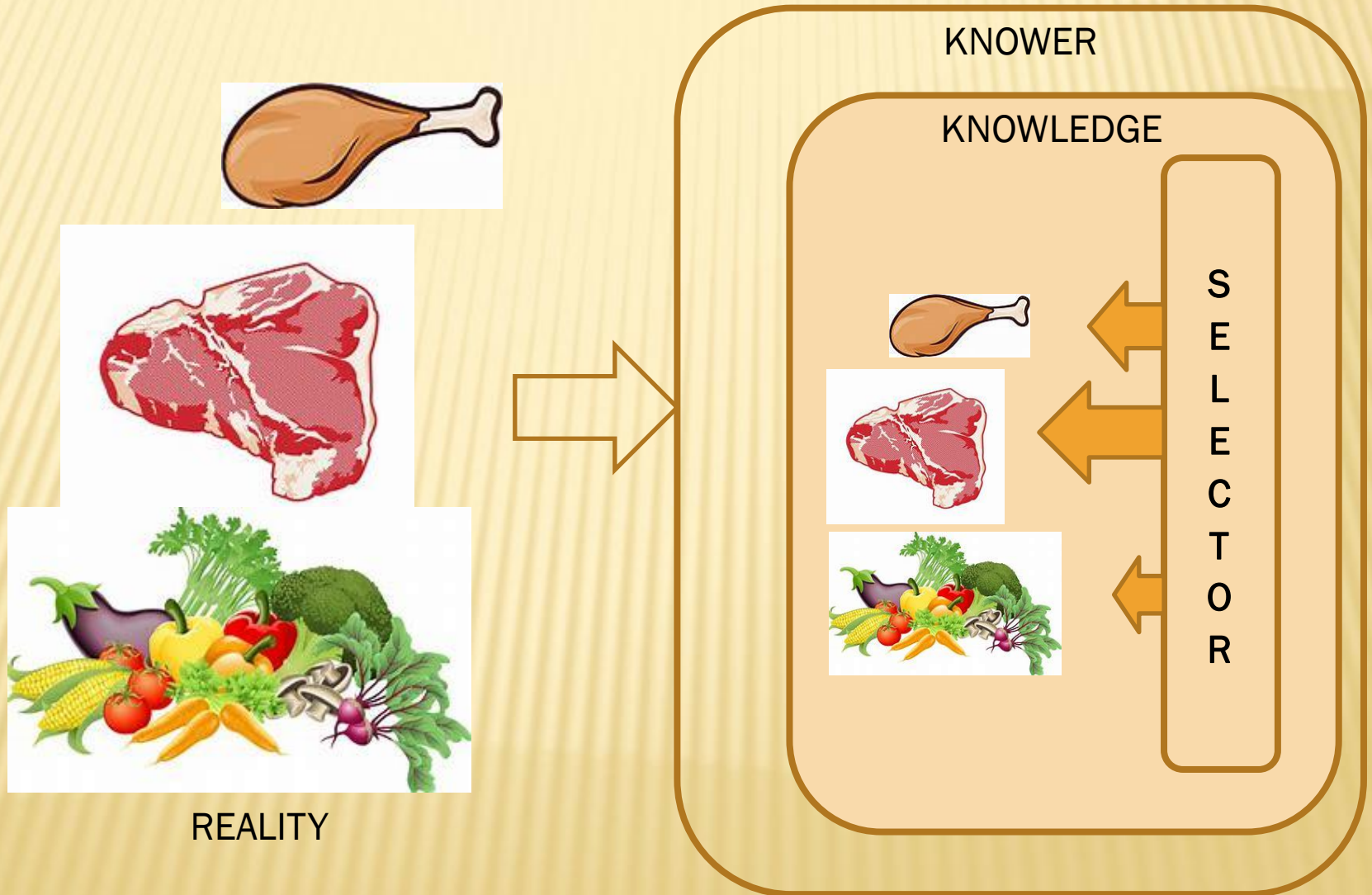
THE WEB OF KNOWERS, 1



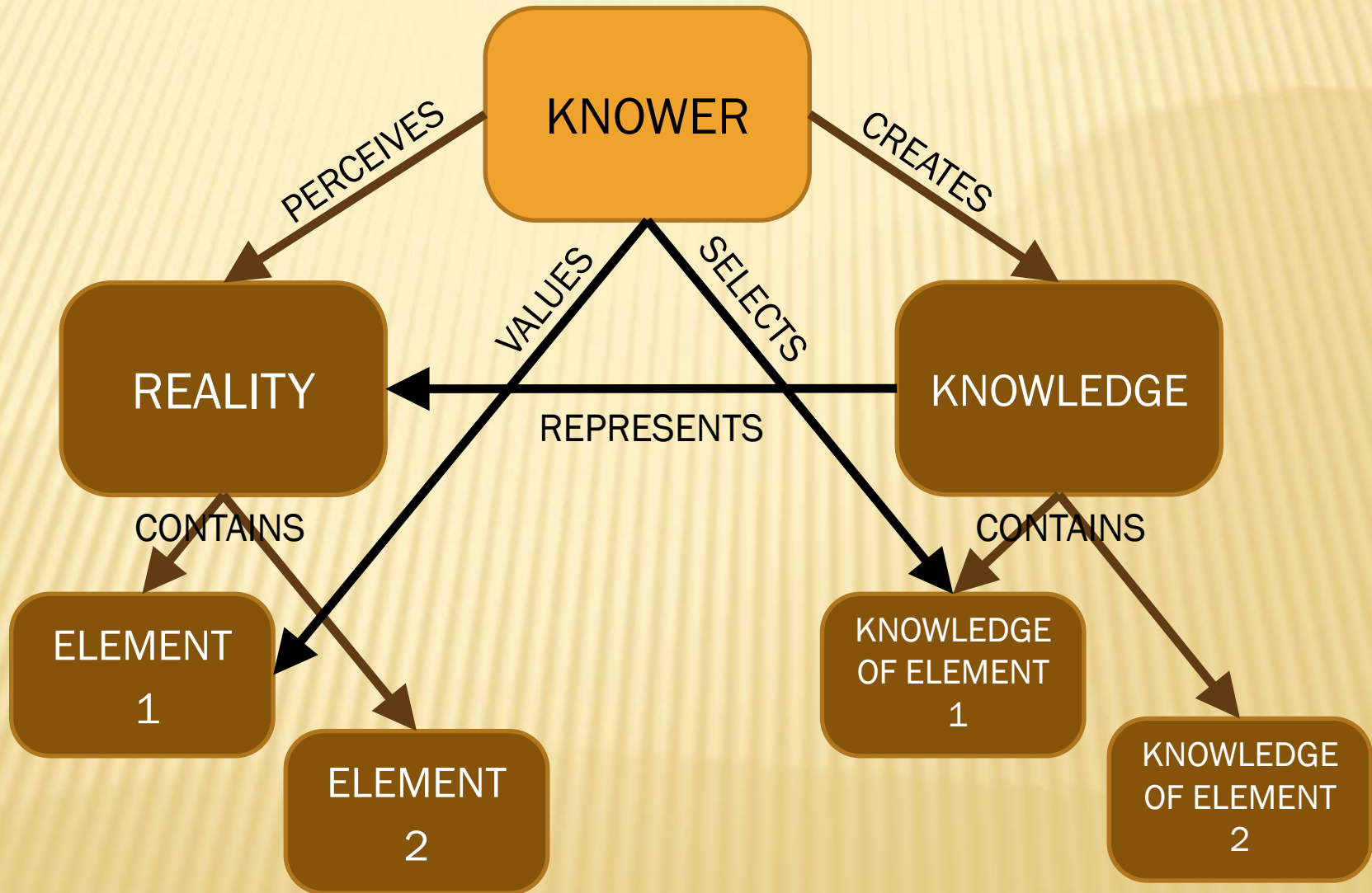
THE WEB OF KNOWERS, 2



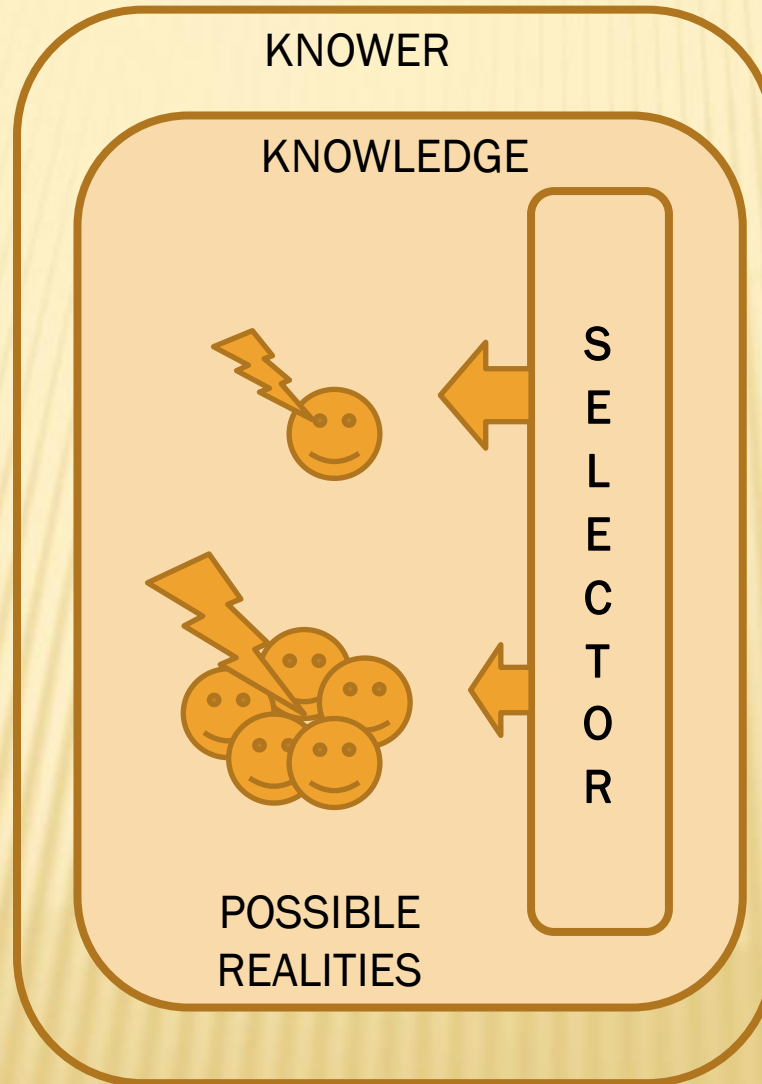
THE WEB OF SENTIENTS, 1



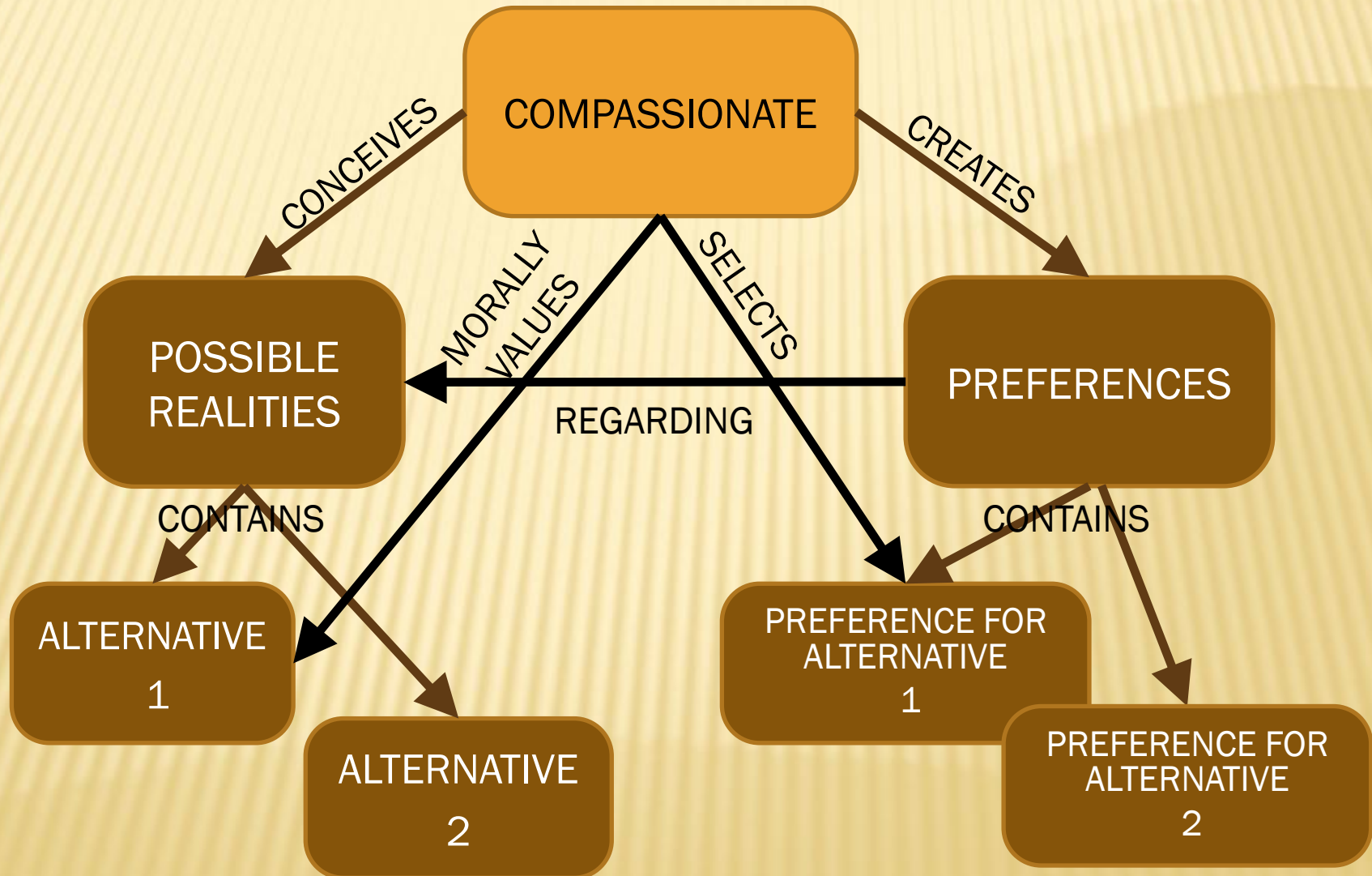
THE WEB OF SENTIENTS, 2



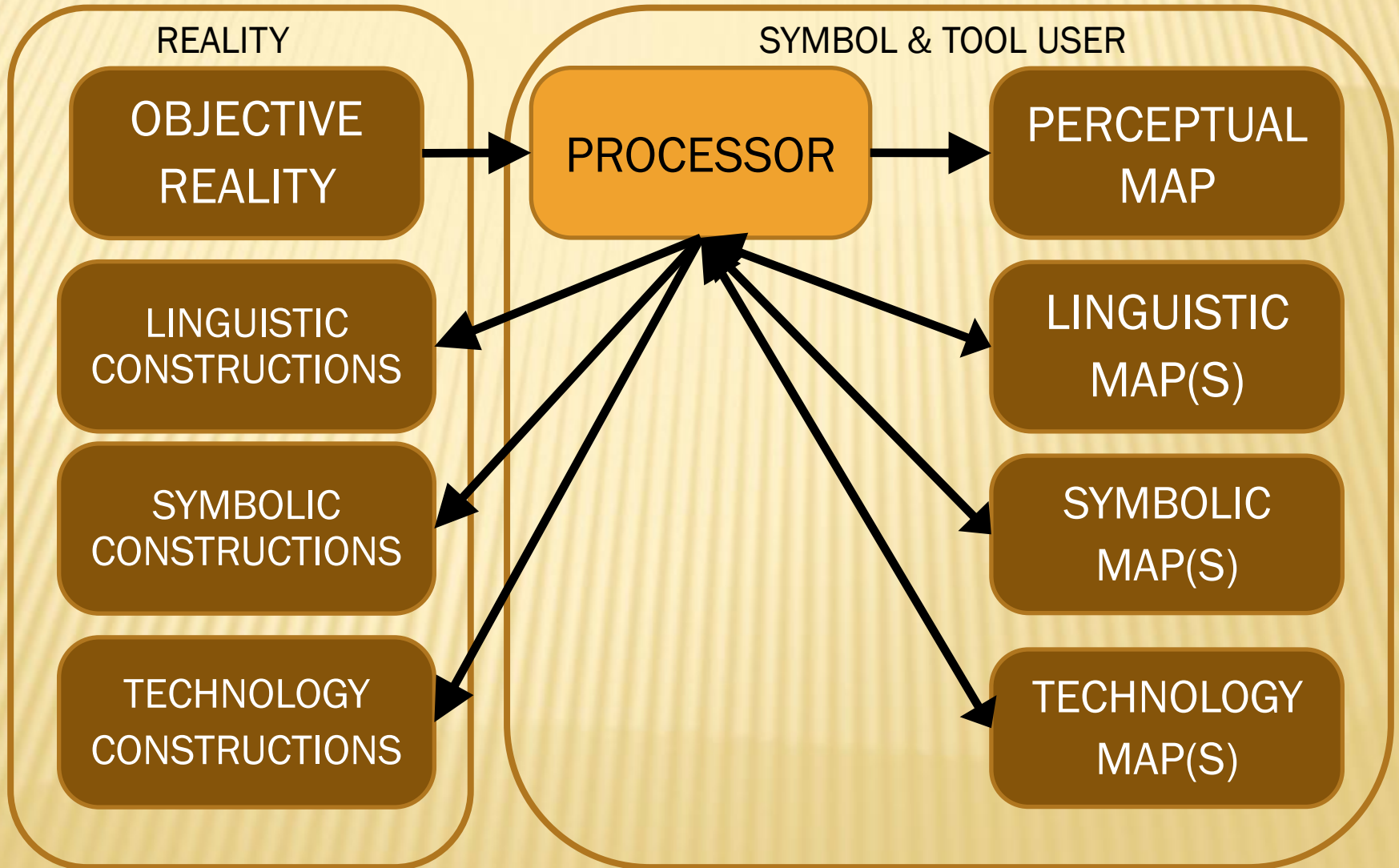
THE WEB OF COMPASSIONATES, 1



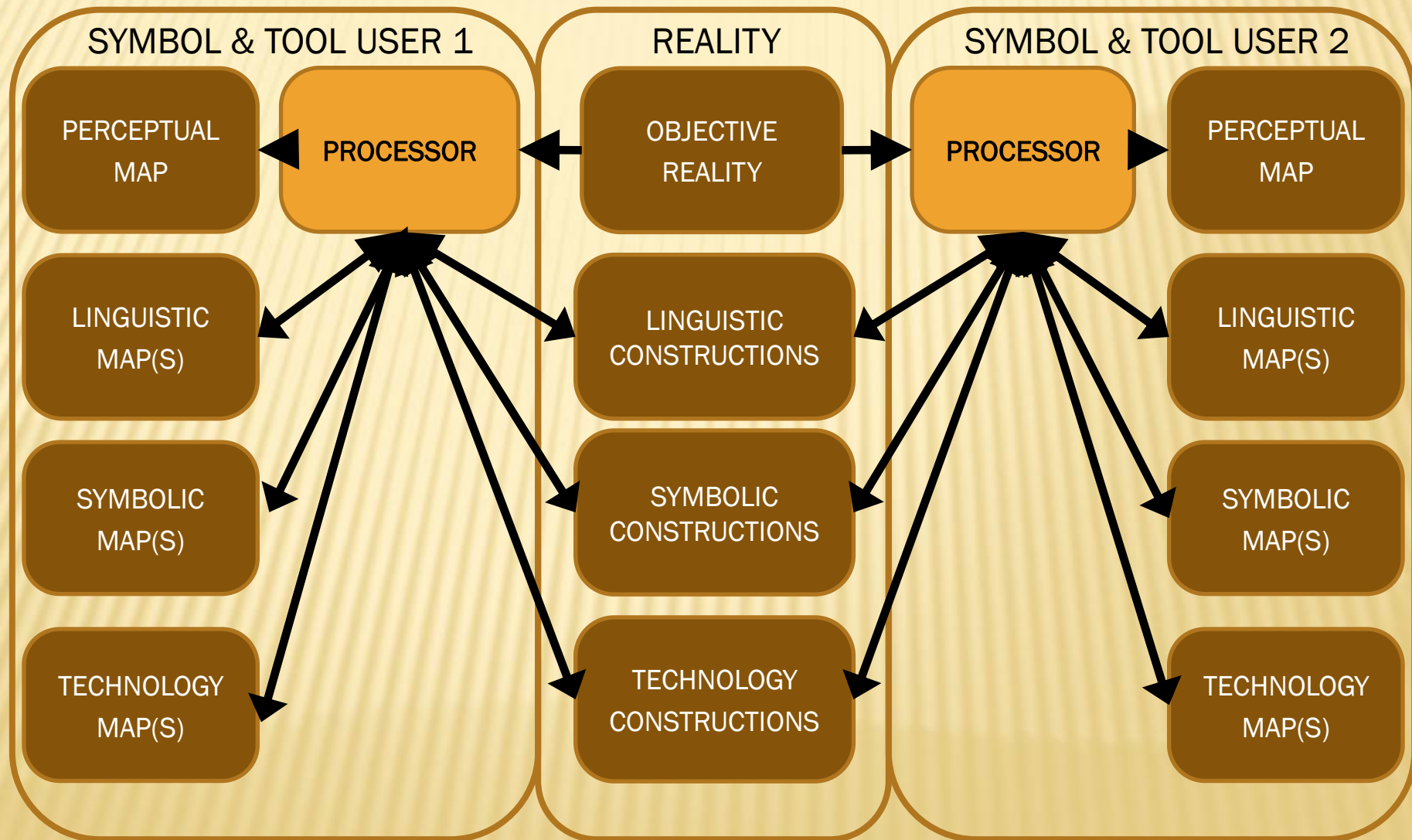
THE WEB OF COMPASSIONATES, 2



THE WEB OF SYMBOL & TOOL USERS



THE WEB OF SYMBOL & TOOL USER ORGANIZATIONS



PART TWO:

RESPECTING THE WEB

THE NATURE OF RESPECT FOR THE WEB

Respect for the web is an
intensional relationship

between

on the giving side, us as individuals and us as a society

and

on the receiving side, the web of existence as a unified whole

There needs to be both

Individual Respect for the Web

and

Social Respect for the Web.

COMPONENTS OF RESPECT FOR A WEB

	COMPONENT	FROM WEB OF
RESPECT	ENVIRONMENTAL & SOCIAL JUSTICE FOR THE WEB	ORGANIZATIONS OF SYMBOL & TOOL USERS
	UNDERSTANDING OF THE WEB	SYMBOL & TOOL USERS
	COMPASSION FOR THE WEB	COMPASSION
	APPRECIATION OF THE WEB	SENTIENCE
	KNOWLEDGE OF THE WEB	KNOWLEDGE

PROPERTIES OF WEBS

- × **Dynamic Type** (static, dynamic token, dynamic type)
 - × **Level** (number of levels of webs of which it is composed, where quarks are at level 0)
-
- × **Extent** (number of tokens of entities and relationships)
 - × **Complexity** (number of types of entities and relationships)
 - × **Resilience** (ability to replace lost entity and relationship tokens, time to recover)
 - × **Evolvability** (the capability to add new entity types and relationships, time to evolve)

OBLIGATION TO DO NO HARM

*Do no harm to any web,
by commission or omission,*

*unless such harm is required
to help a higher web.*

TO HARM A WEB

- ✘ Decrease its extent (destroy some of its tokens).
- ✘ Decrease its complexity, decrease its diversity (destroy some of its types).
- ✘ Decrease its resilience (increase the time it takes to recover its previous extent and complexity).
- ✘ Decrease its evolvability (increase the time it takes to add new types and relationships).

OBLIGATION TO HELP

Act to help all webs,

*giving higher preference
to higher webs.*

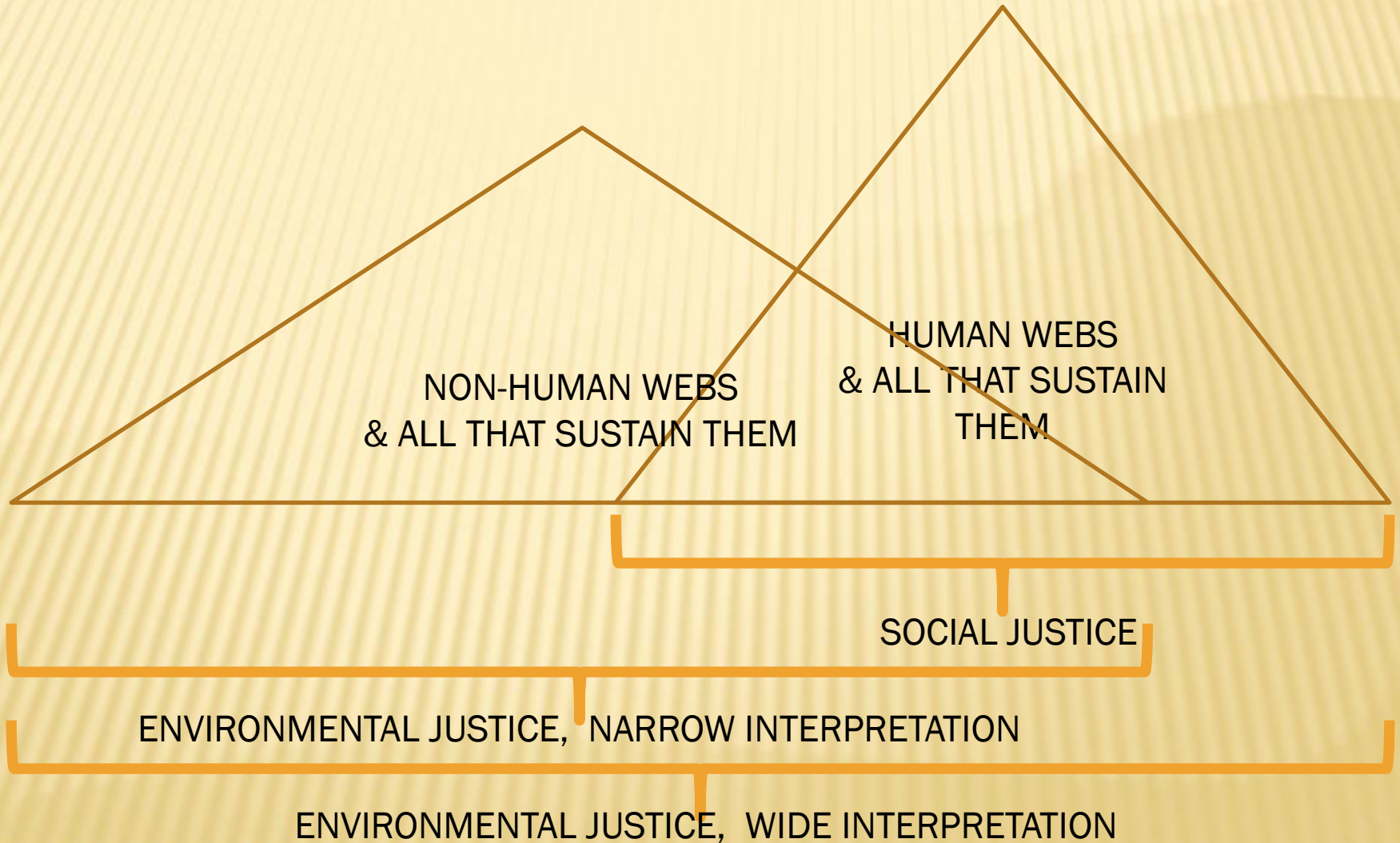
TO HELP A WEB

- ✘ Increase its extent (enable addition of some of its tokens and/or their relationships).
- ✘ Increase its complexity, increase its diversity (enable addition of some of its types and/or their relationships).
- ✘ Increase its resilience (decrease the time it takes to recover its previous extent and complexity).
- ✘ Increase its evolvability (decrease the time it takes to add new types and relationships).

THE QUESTION OF JUSTICE

- ✘ If helping a web does no harm to another web, then there is no question of what to do.
- ✘ In most cases however, we need to choose between webs:
 - + either choose between helping one web or helping another, or
 - + choose to harm one web to help another.
- ✘ Justice requires the choice be balanced.

SOCIAL JUSTICE & ENVIRONMENTAL JUSTICE



DIFFERENCES BETWEEN SOCIAL JUSTICE & ENVIRONMENTAL JUSTICE

ENVIRONMENTAL JUSTICE

- ✘ Appreciation Based
- ✘ Token Blind
- ✘ Maximizes Survival
- ✘ Complexity trumps Extent
- ✘ Favors Extensionality
- ✘ Favors Types fostering Resilience & Evolvability
- ✘ Allocation Blind

SOCIAL JUSTICE

- ✘ Compassion Based
- ✘ Token Aware, top down
- ✘ Maximizes Happiness
- ✘ Complexity Blind
- ✘ Favors Intensionality
- ✘ Resilience & Evolvability Blind
- ✘ Allocation Aware

POSSIBLE SOLUTION

- ✘ Allocate effort between human and non-human webs based on *Environmental Justice*.
- ✘ Within the human web, allocate effort based on *Social Justice*.

THE END
