



What is Systems Thinking?

TODAY:

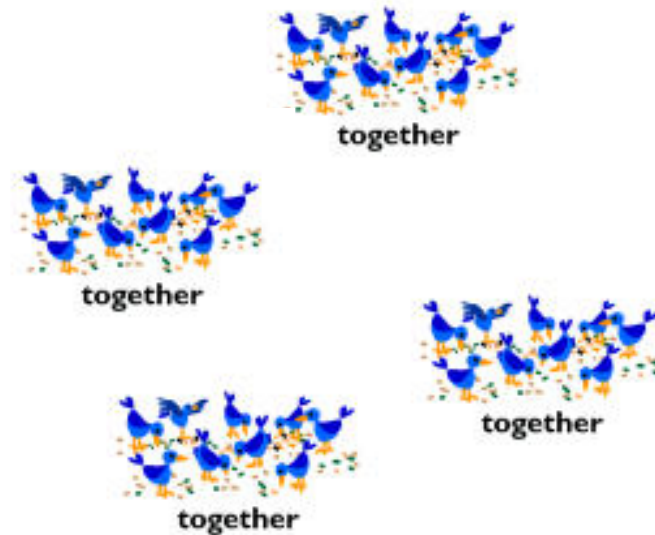
- 1) Point out the duality of systems thinking
- 2) Ask what you mean by 'system'; how do you use it?

Mike Metcalfe

Rescher's [1979]: History of Systems Thinking

System =

- Structure
- Organisation
- To make stand together
- Joined Together
- Connected
- Composite Whole

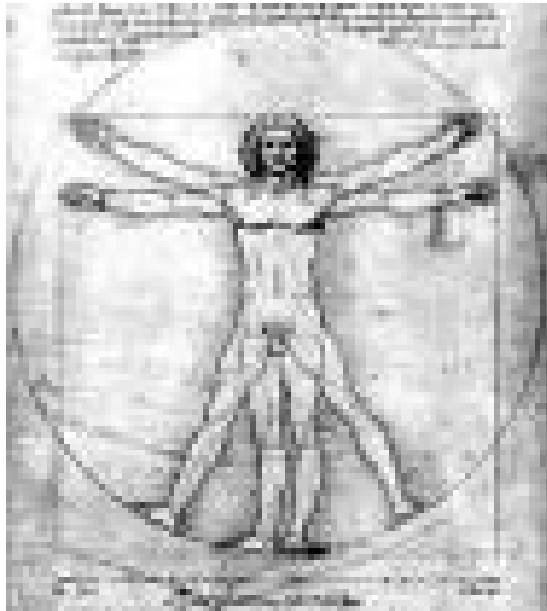


‘System’ In Greek Antiquity

- **Flock of Birds**
- **Music**
- **Poetry**
- **Military Formation**

**Stoics use ‘System’ to mean
natural or physical order.**

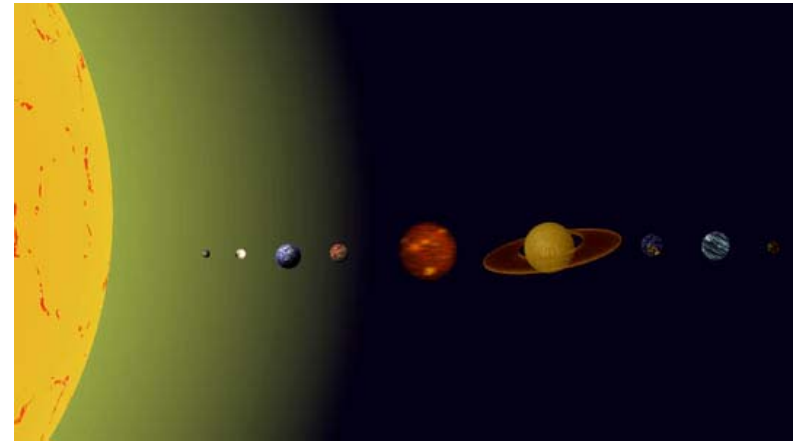
Eg Solar System



Renaissance

- **Protestants talk of ‘articles of faith’ as being a system.**
- **Philosophers “System of logic”
System of Rhetoric” and “ System
of Ethics”**
- **“Body of Knowledge” not
dictionary**
- **Christian Wolff mentions “organic
system of truths”**
- **Leibniz, “my system of logic” ie. a
particular approach**

Systems vs Science



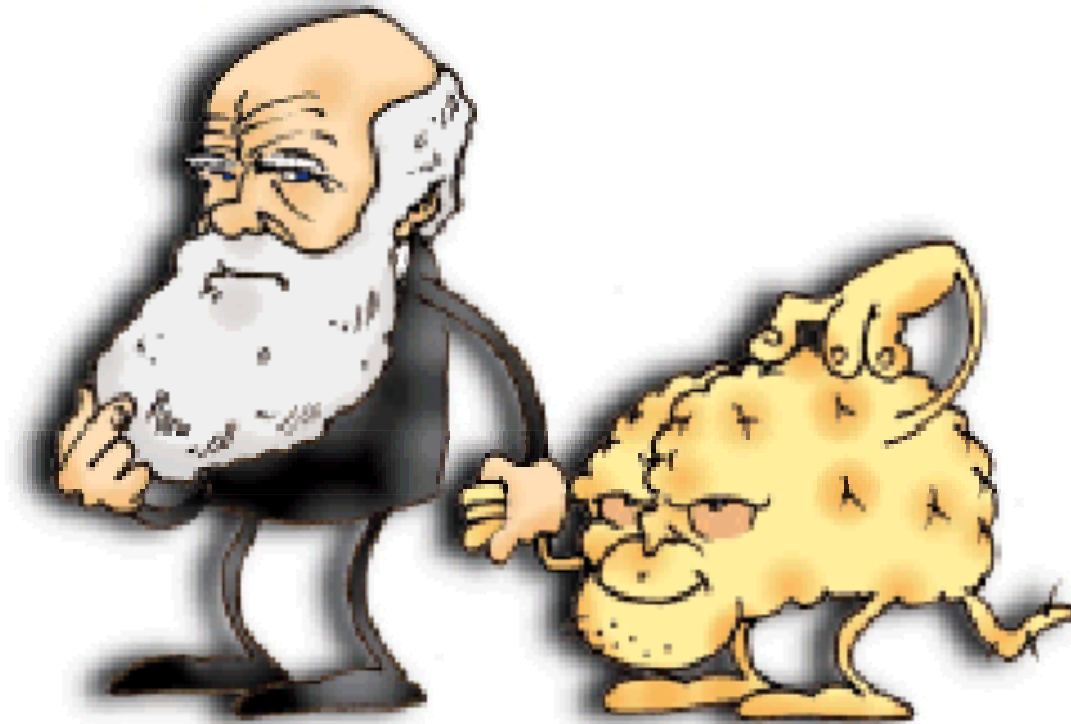
- **1749 Condillac (empiricist, experimental philosophy like Newton)**
 - Critique of Non Physical Systems**
- **Duality of Systems Thinking**
 - 1) Like biological system
 - 2) **System-for-thinking (cognitive systems)**
- **Lambert (1728 – 1777) List attributes of systems eg self sustaining, efficient to purpose...**



Duality Of Systems Thinking

- 1) Physical ie like human body interdependence of sub-super systems, feedback, transformation, input/output...General Systems Theory, Cybernetics... systems engineering...???
- 2) Systems For Thinking About Human Activity Problems eg Churchman, Ackoff, Checkland, Mitroff, Weick, Mason, Linstone...

Systems As A System-for-Thinking??



•Research

•Learning

•Inquiry

Into Human Activity

Eg. From 'Thing' To 'System'

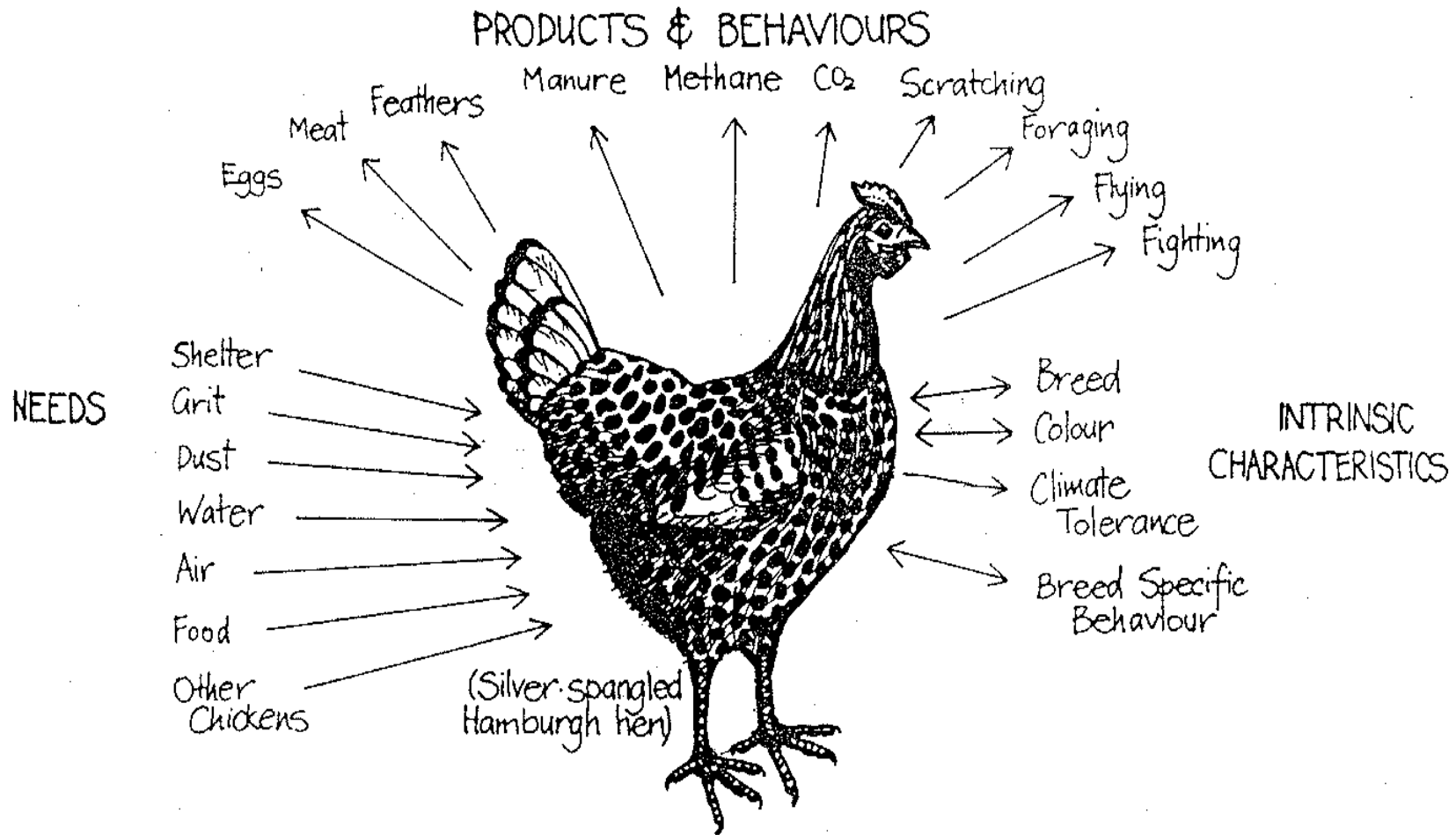


FIGURE 1.1 Analysing the characteristics, needs, and products of each element in the system in order to put it in the right place relative to other elements in the system.

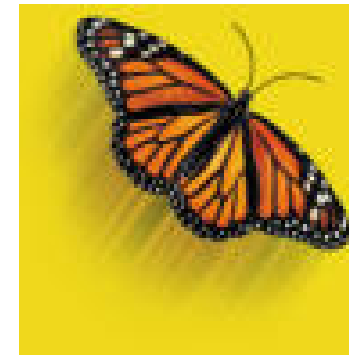
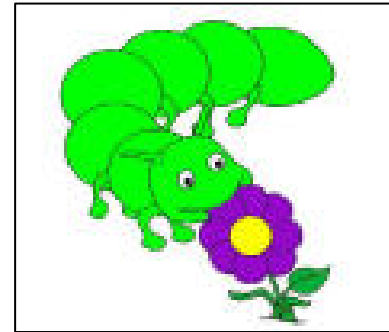
Eg. Problem In System [Ackoff]

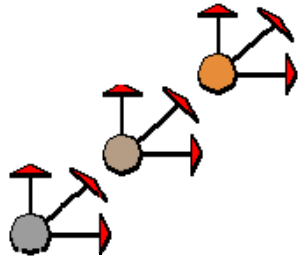
- Synthesise don't Analyse
- What is the problem connected to?
- What would be the ideal form?
- What is the perspectives of the elements?
- Change the systems perspective on the problem
- Etc...



Eg: Using System Attributes To Appreciate Problems

- What is its...
 - Boundary
 - Purpose
 - Transformation
 - Perspectives of system elements
 - Connectivity (intra and inter)





Boundary Critique

- Boundary determined by perspective
- Critique = insight from different perspectives
- Creative dialectic to solve problems.
- Argumentative Inquiry

Hegel's Dialectic
as applied to educational philosophy

"You're destroying
Western civilization!"



THESIS
Traditional
Education

"You're destroying
children's souls!"



ANTITHESIS
Progressive
Education



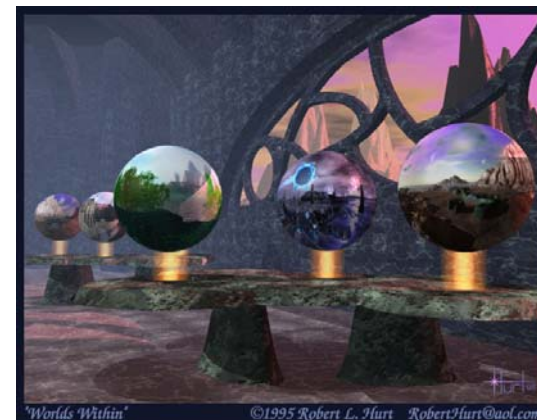
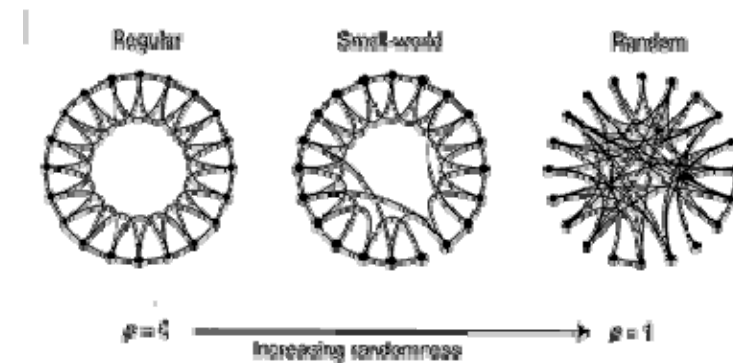
Reasoned scholarly dialogue

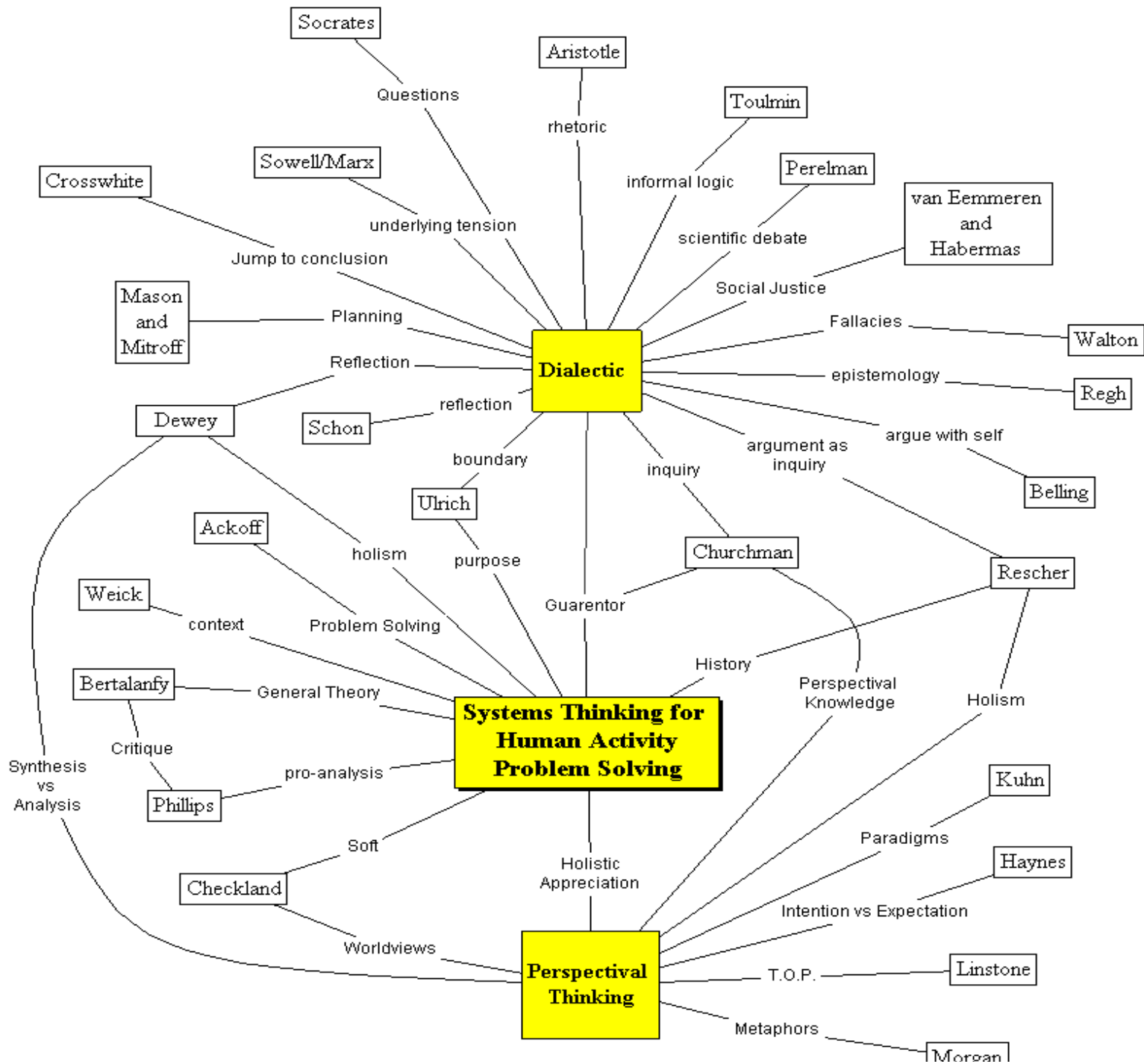


SYNTHESIS

Eg Complexity Theory

- **Unexpected properties emerge from complex systems which cannot be studied by analysis (picking apart).**
- **Self Organisation Theory**
- **Small Worlds Networks**
- **Etc...**





Literature

Systems Thinking: The Future??

