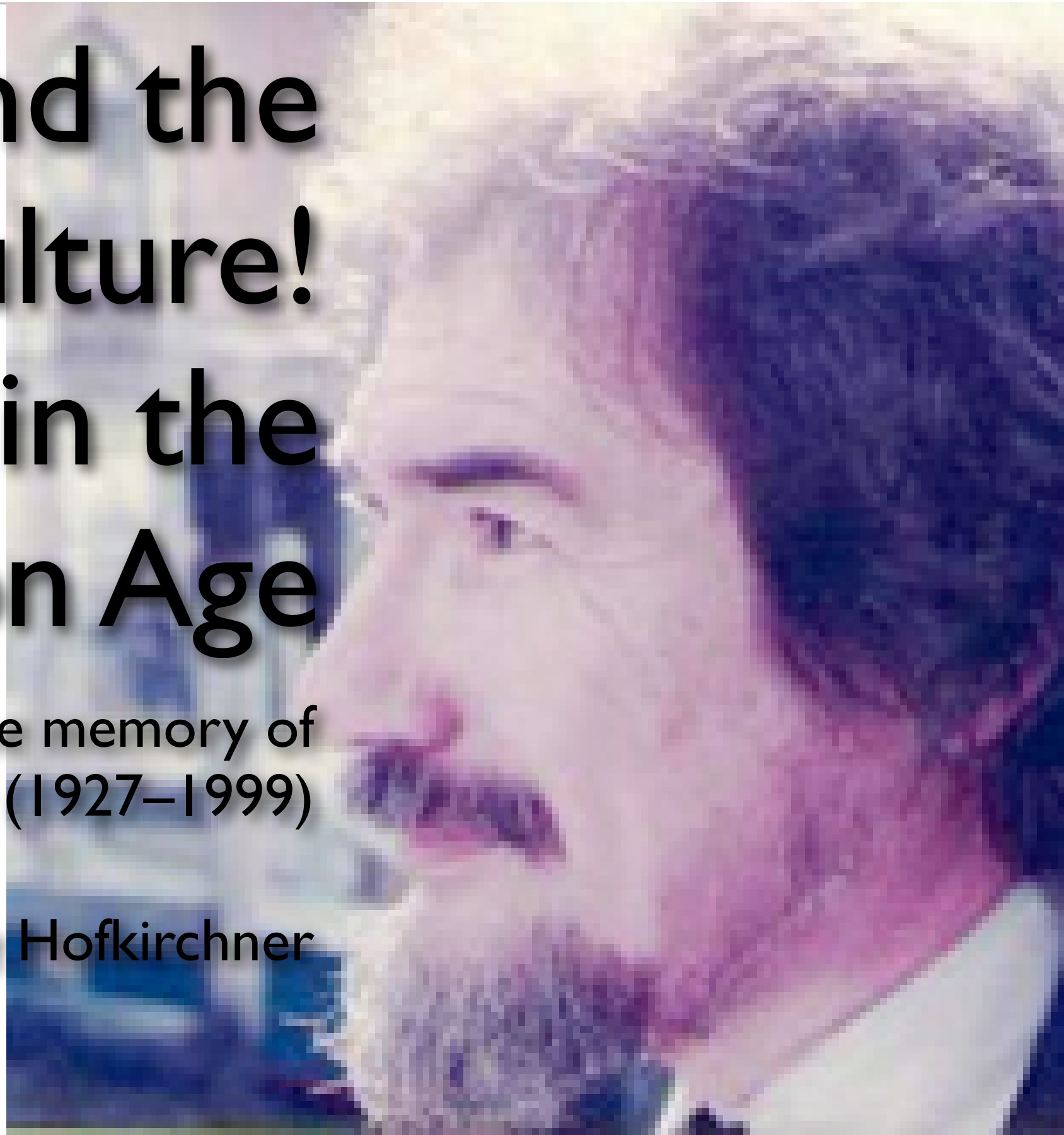


# Beyond the Third Culture! Science in the Information Age

Lecture dedicated to the memory of  
Tom Stonier (1927–1999)

By Wolfgang Hofkirchner





# Overview

1. Science

2. Information Science

2.1 Task

2.2 Domain

2.3 Approach





**Tom Stonier  
worked in the field  
of Science-  
Technology-  
Society**

**I Science**

Levels **Science (natural,  
social)**

Theory-Technology (Practice)

Task: to contribute to  
problem-solving with  
research findings

Theory-Theory (Reality)

Domain: fields to be  
researched

Theory-Empirical (Method)

Approach: how to  
research



**Tom Stonier –  
author of an  
information science  
trilogy**

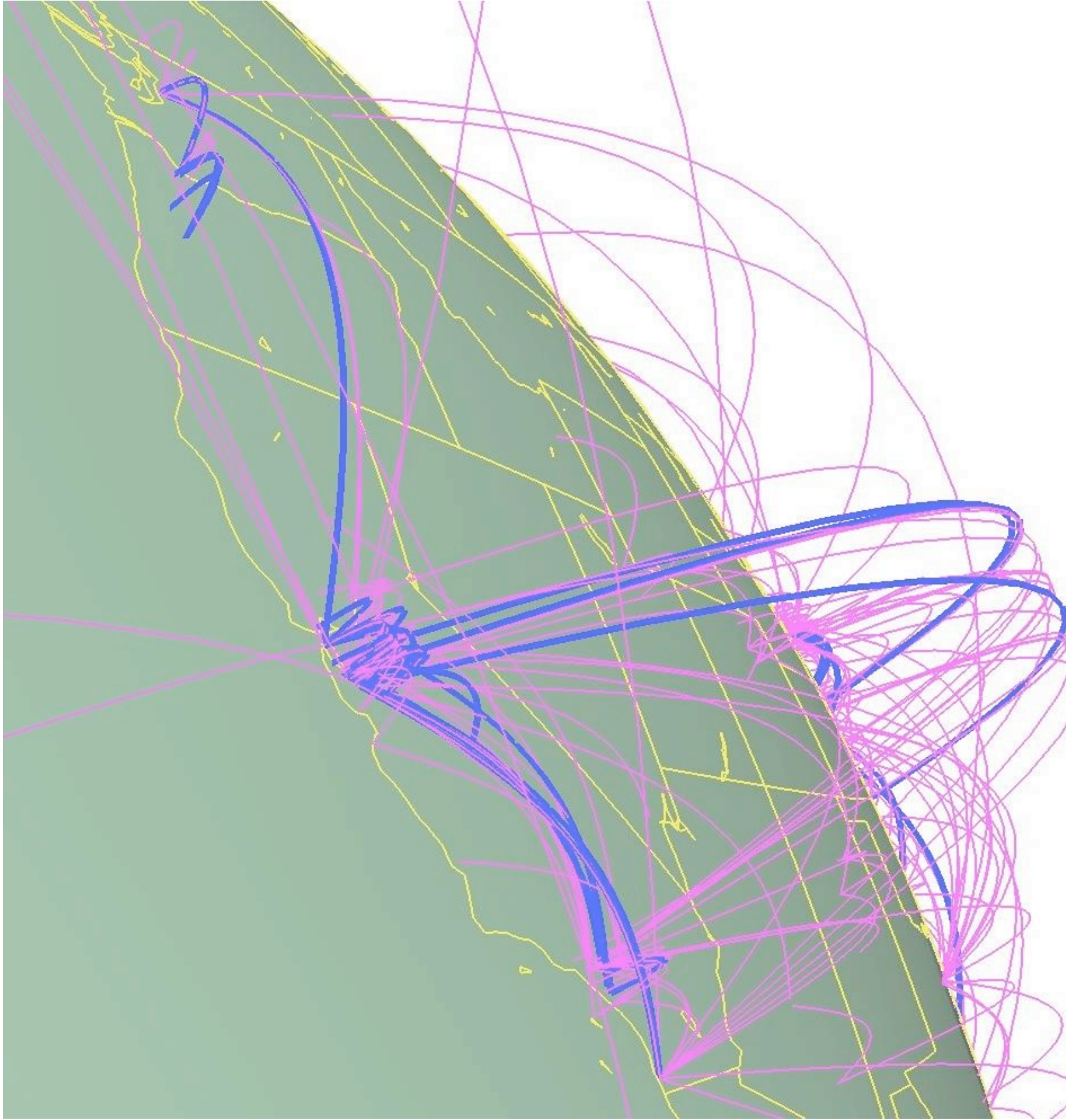
## **2 Information Science**

**= science for, about and with  
means provided by the  
information society**



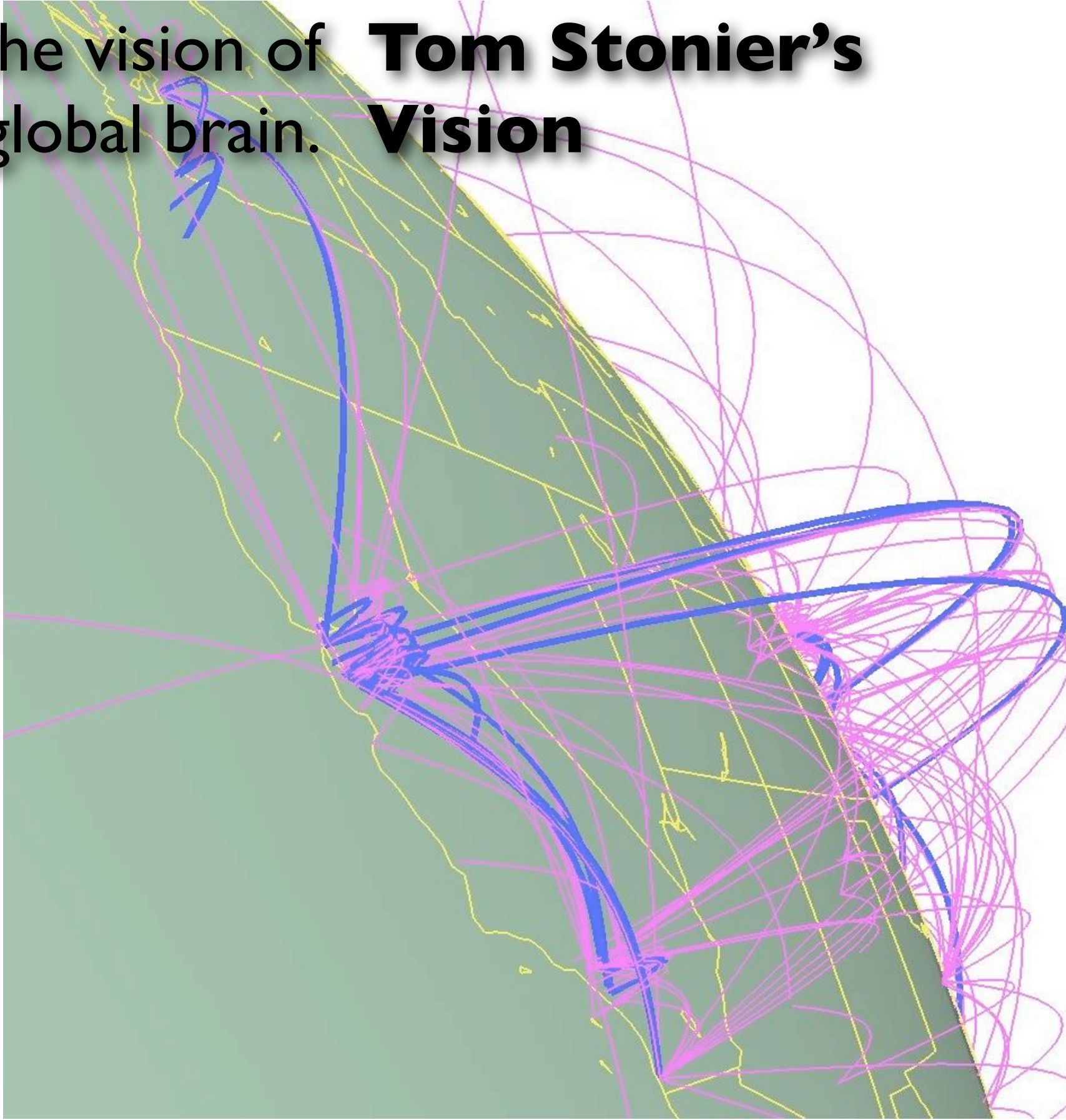


## 2.1 Task





Tom Stonier shared the vision of **Tom Stonier's**  
the global brain. **Vision**





Tom Stonier found that in 1851  
Nathaniel Hawthorne had his  
novel character Clifford in “The  
House of the Seven Gables”  
make the comparison of the  
globe with a head and brain, in  
view of the telegraph:

*“... by means of electricity, the  
world of matter has become a great  
nerve, vibrating thousands of  
miles...  
the round globe is a vast head, a  
brain, instinct with intelligence!”*

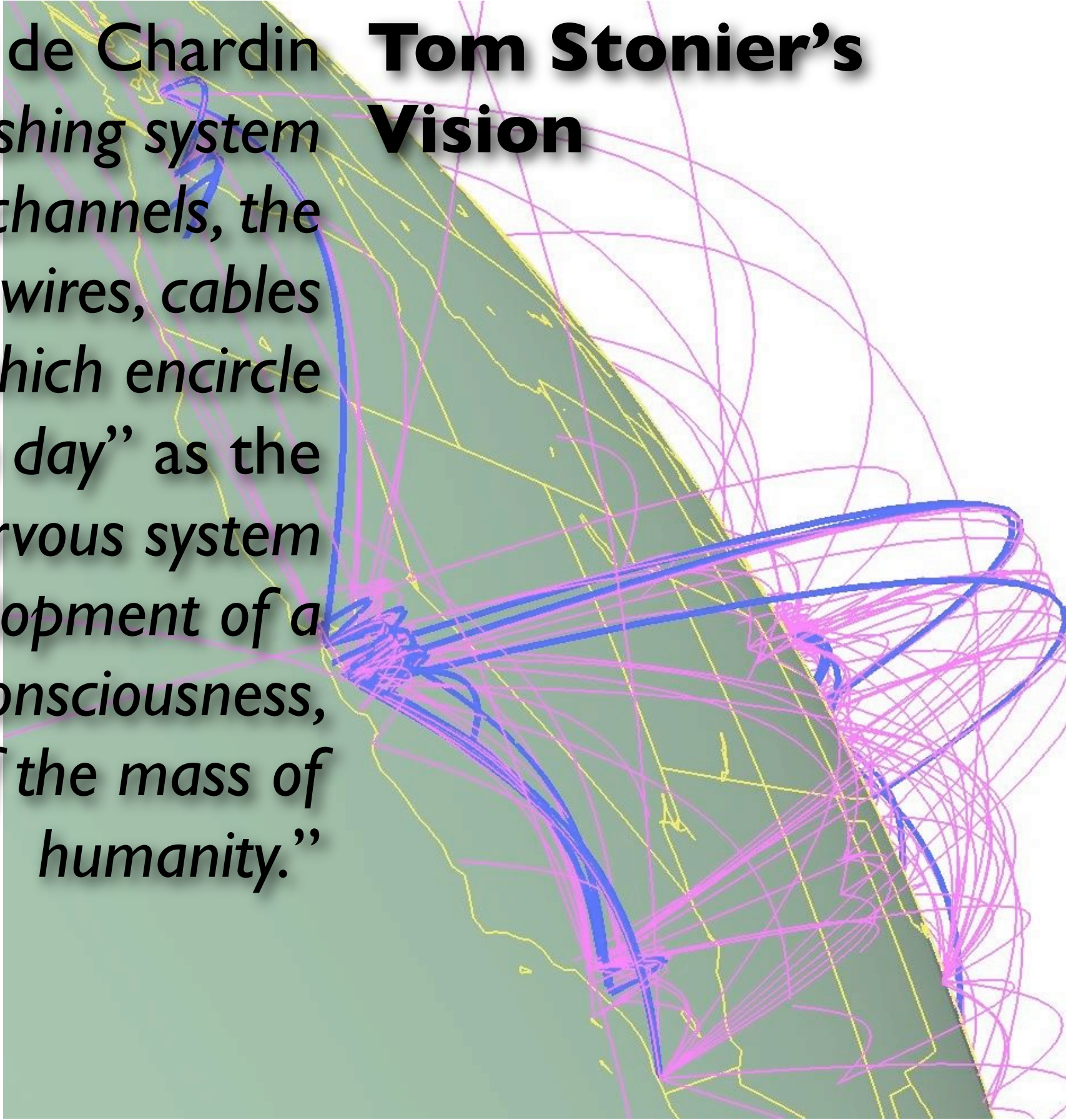
## **Tom Stonier's Vision**





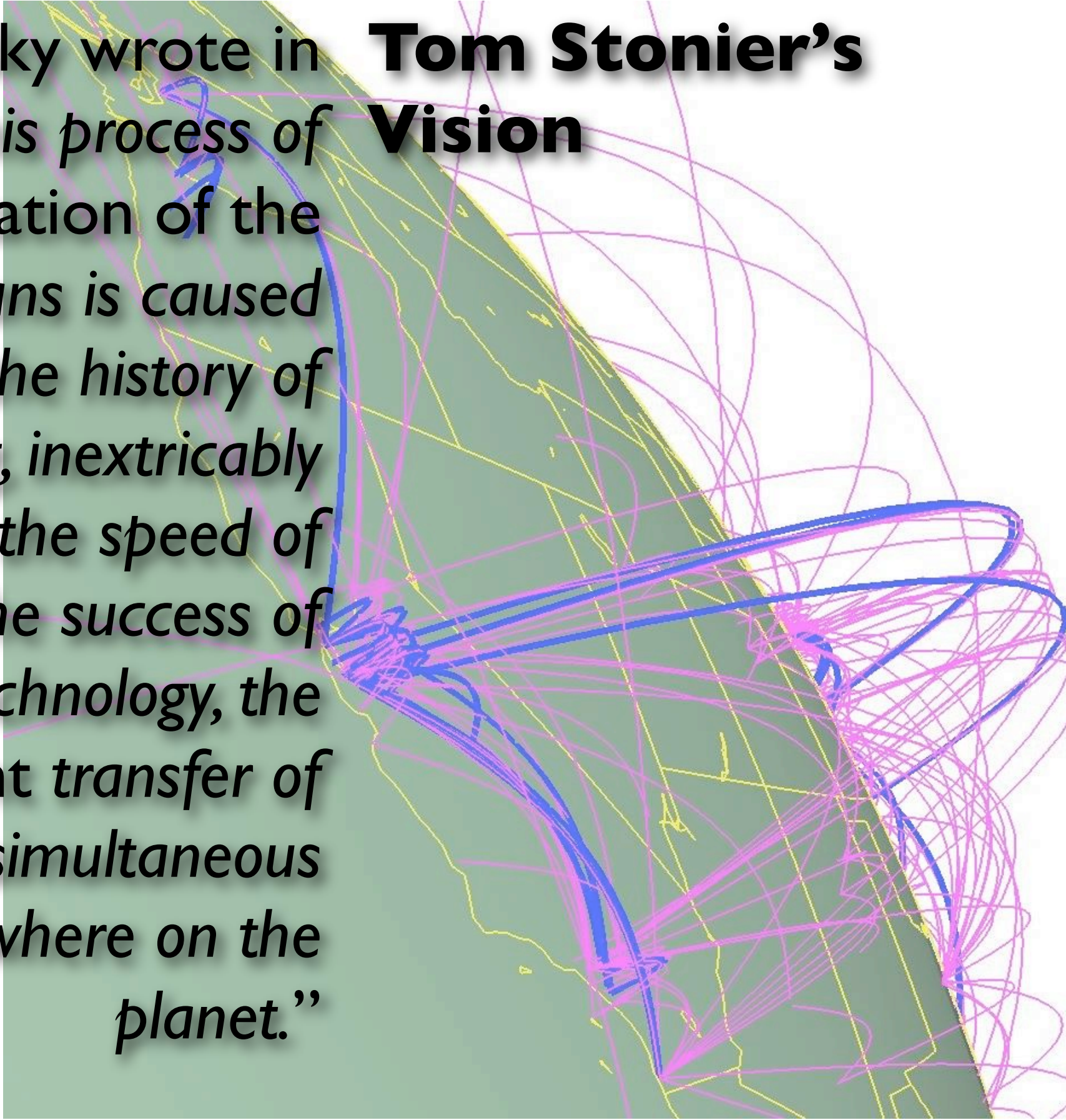
In 1925 Teilhard de Chardin regarded the “*astonishing system of land, sea and air channels, the postal connections, wires, cables and radio waves, which encircle the earth more each day*” as the “*creation of a real nervous system of humanity, development of a common consciousness, networking of the mass of humanity.*”

## **Tom Stonier's Vision**





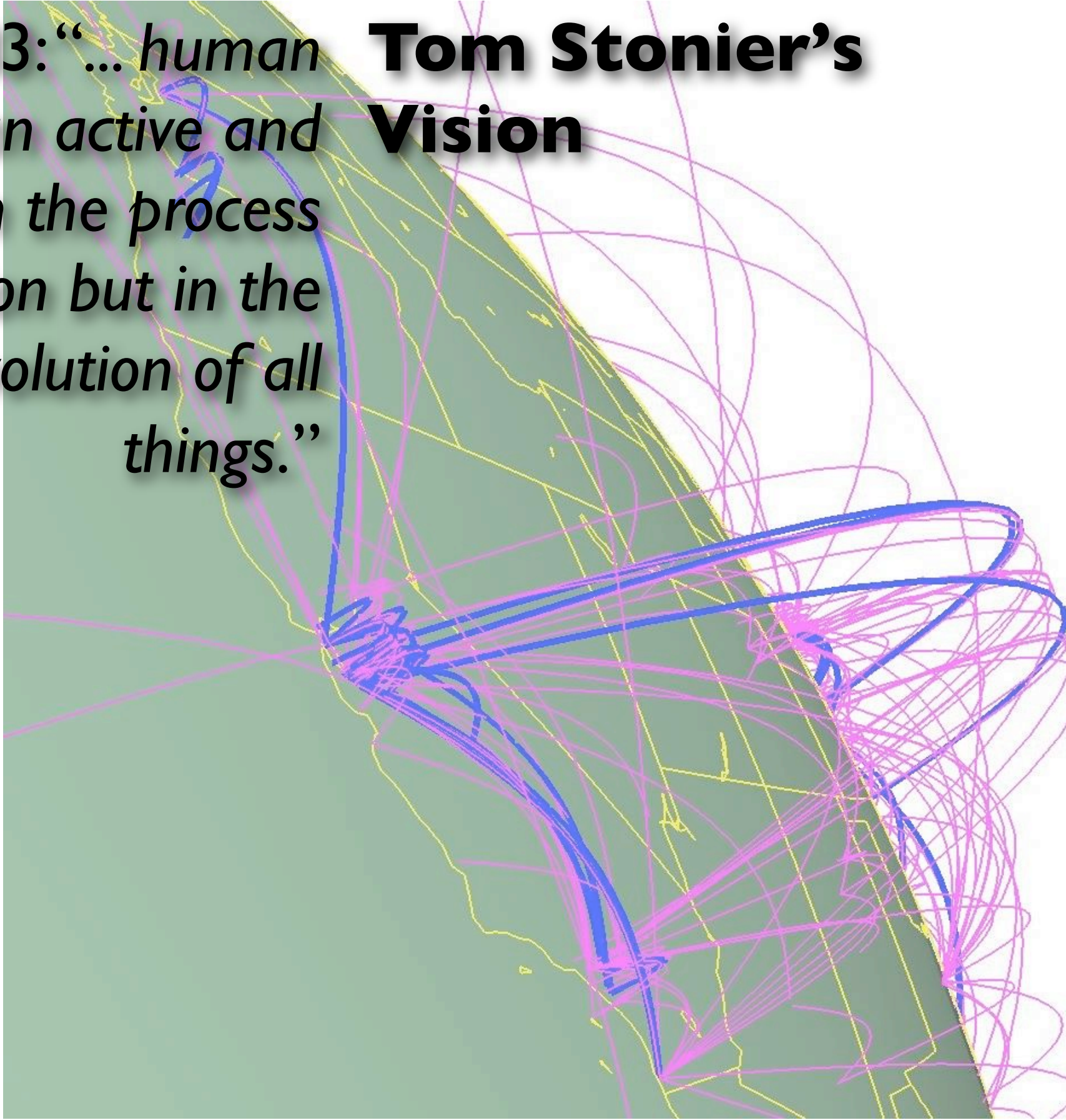
Vladimir I. Vernadsky wrote in **Tom Stonier's Vision**  
1937/38: “... *this process of complete habitation of the biosphere by humans is caused by the course of the history of scientific thinking, inextricably linked with the speed of communications, the success of transport technology, the possibility of instant transfer of thought, and its simultaneous discussion everywhere on the planet.*”





J. Salk wrote in 1983: “... human beings now play an active and critical role not only in the process of their own evolution but in the survival and evolution of all things.”

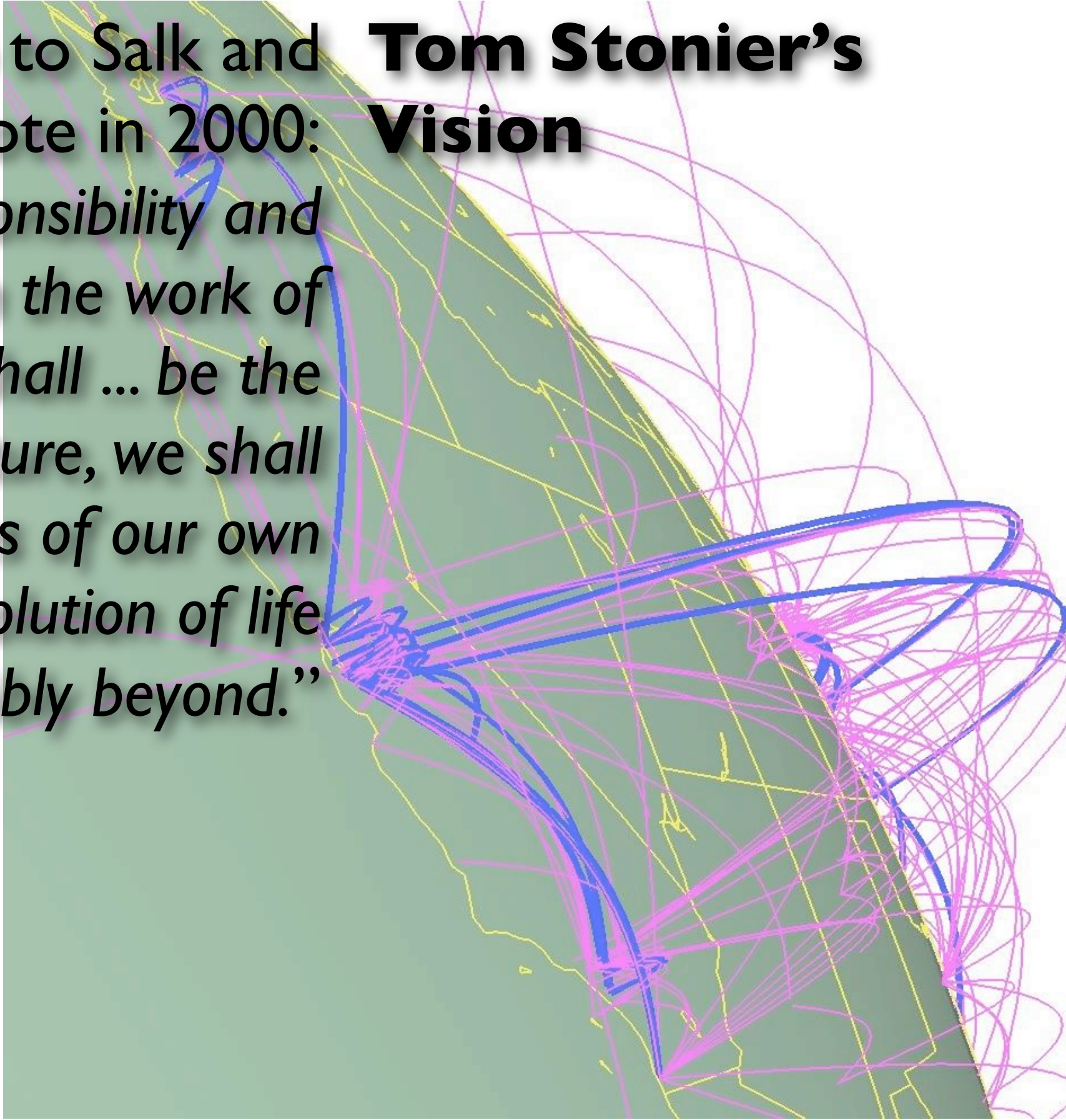
## **Tom Stonier's Vision**





B.H. Banathy links up to Salk and **Tom Stonier's**  
wrote in 2000: **Vision**

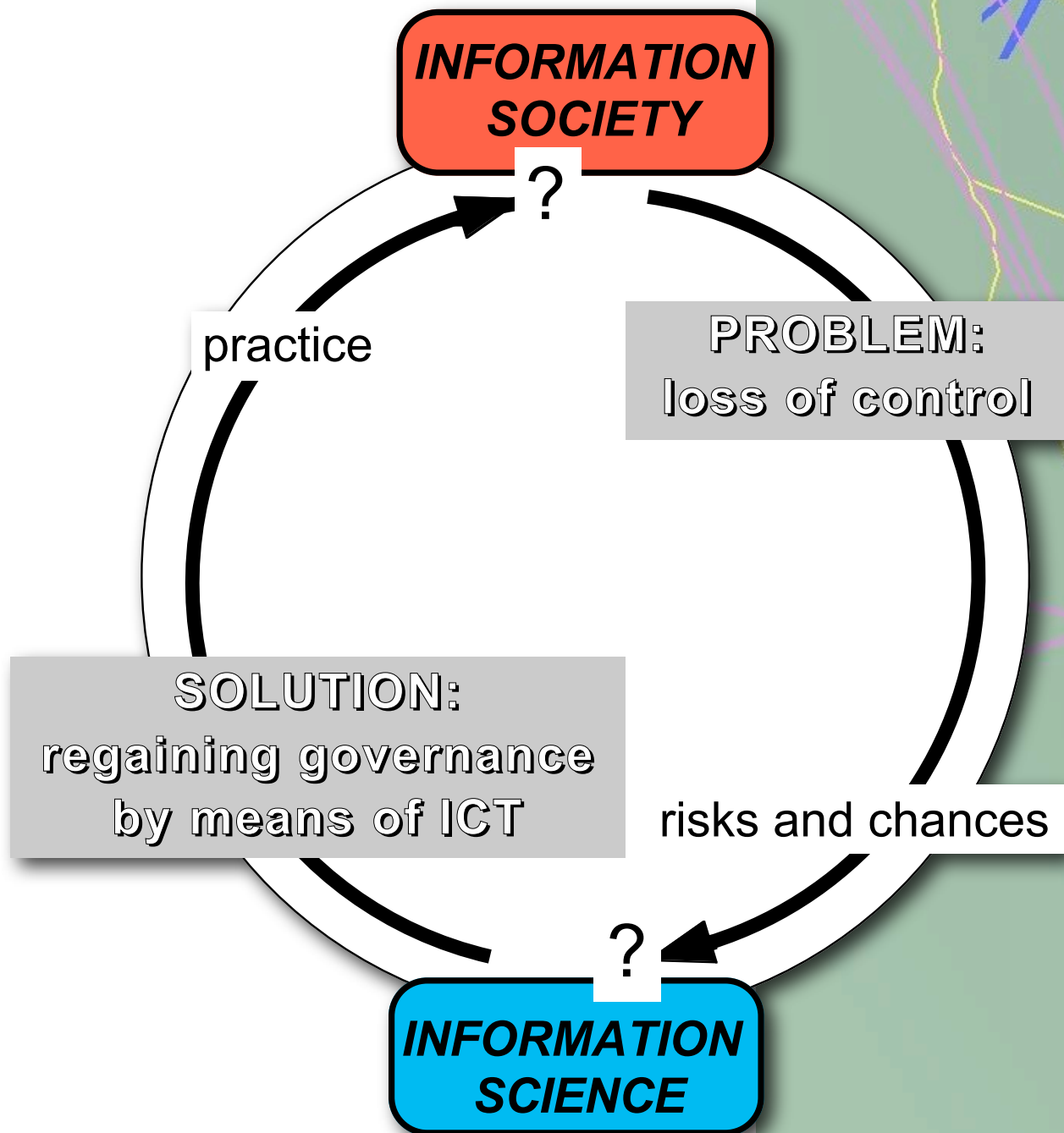
*“If we accept this responsibility and engage creatively in the work of evolution we shall ... be the designers of our future, we shall become the guides of our own evolution and the evolution of life on earth and possibly beyond.”*







# to design a sustainable global information society **The information science task**

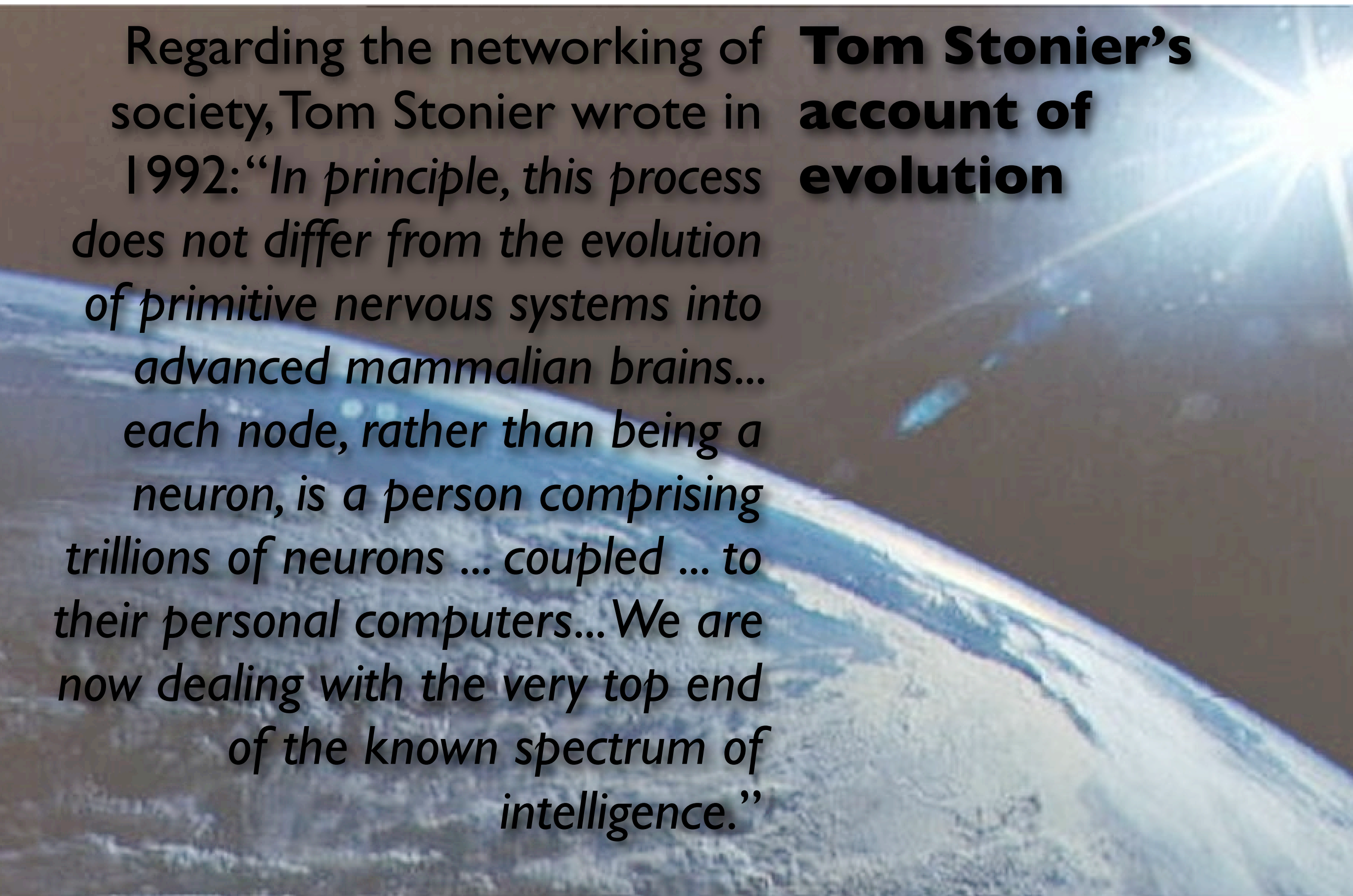


# 2.2 Domain

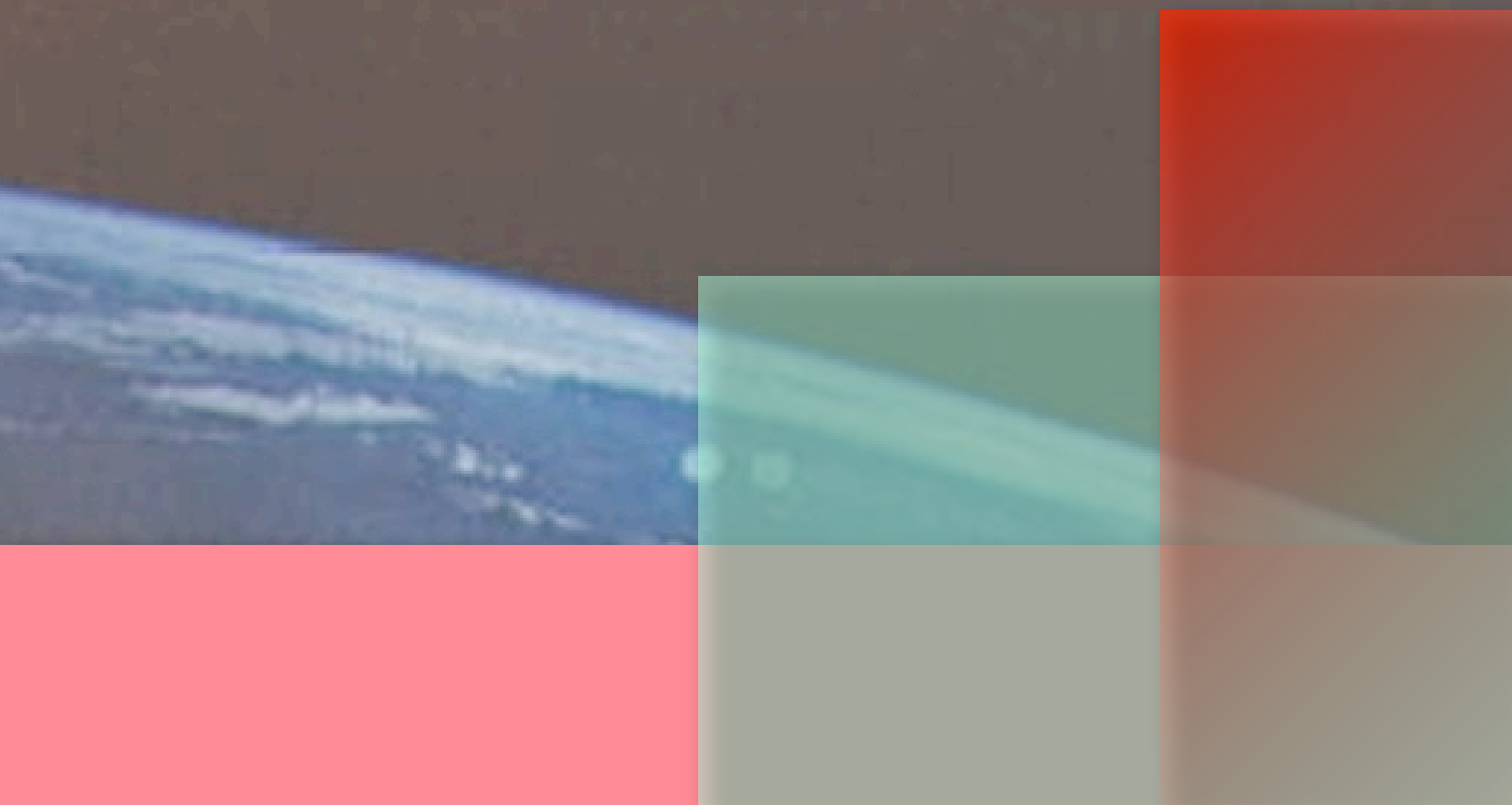


Regarding the networking of society, Tom Stonier wrote in 1992: “In principle, this process does not differ from the evolution of primitive nervous systems into advanced mammalian brains... each node, rather than being a neuron, is a person comprising trillions of neurons ... coupled ... to their personal computers... We are now dealing with the very top end of the known spectrum of intelligence.”

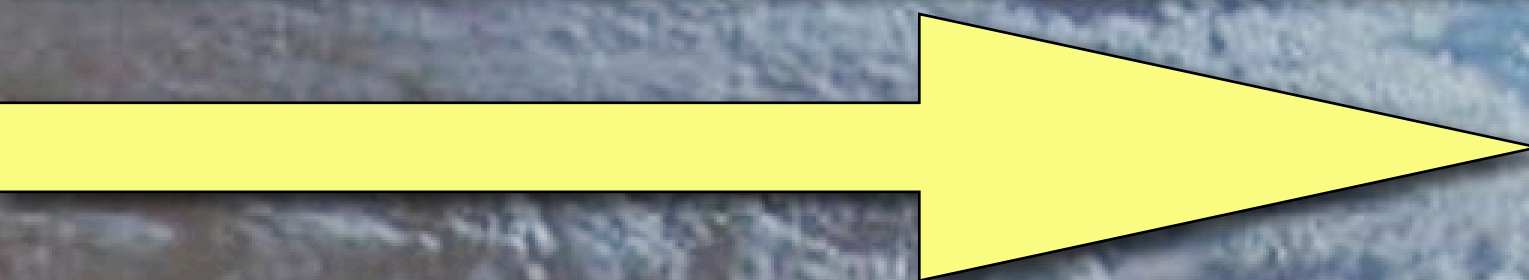
## **Tom Stonier's account of evolution**



# Evolution of systems



supersystem  
hierarchy  
(dominance)



metasystem transition (emergence)



# Evolution of systems



better,  
whole,  
particular  
  
less good,  
parts,  
universal

potential, old,  
necessary

actual, new,  
contingent



# Evolution of systems

social systems

living systems

dissipative systems

physical,  
chemical self-  
organisation

biotic  
self-  
organi-  
sation

social  
self-  
organi-  
sation

# Evolution of information

social information

biotic information

physical, chemical  
information

physical,  
chemical self-  
organisation

biotic  
self-  
organi-  
sation

social  
self-  
organi-  
sation



# Information concepts

	information in the context of...		
	cognition...	commu- nication	co-operation...
	is an object that can be...		
“hard” science perspective	received and processed	transmitted	distributed, stored, retrieved
“soft” science perspective	is a construction done by subjects...		
	internally	interactively	externally

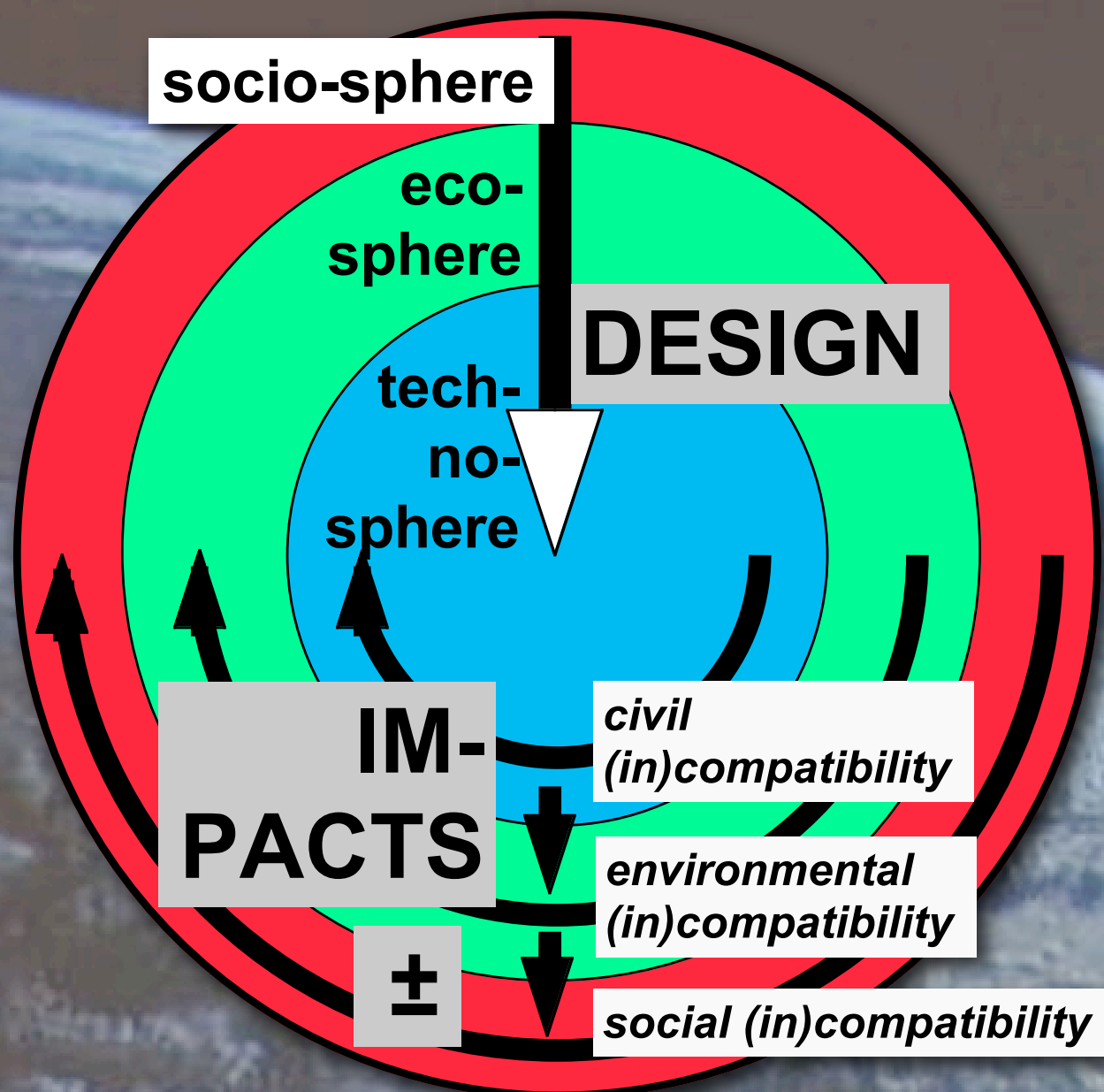


# Information concepts

	information in the context of...		
	cognition...	commu- nication	co-operation...
	is an object that can be...		
“hard” science perspective	received and processed	transmitted	distributed, stored, retrieved
“soft” science perspective	is a construction done by subjects...		
	internally	interactively	externally
	is a process by which systems relate their self- organised order to perturbations originating in...		
unifying perspective	their umwelt	co-systems	the system they give rise

any condition crucial for designing a sustainable global information society

# The information science domain





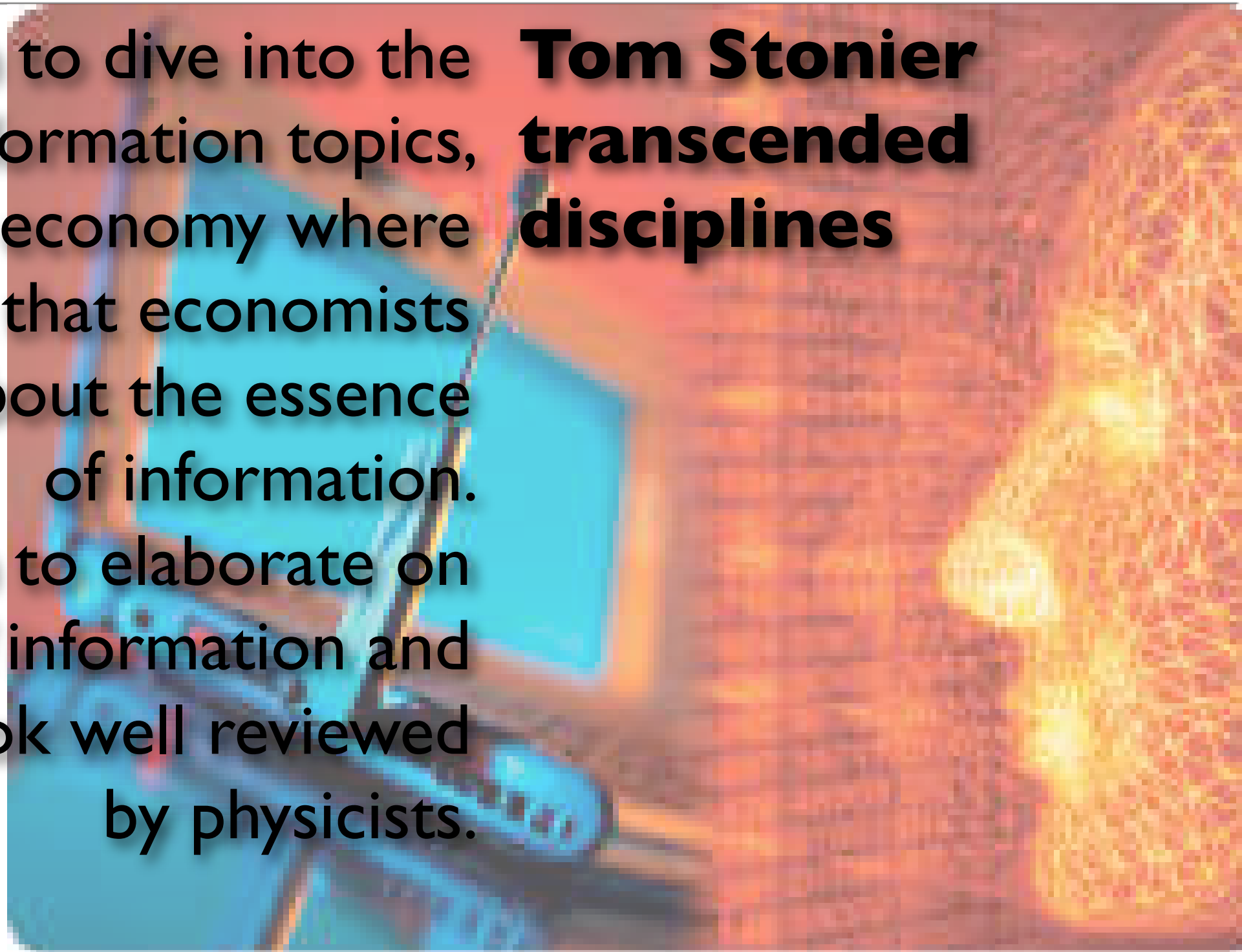


## 2.3 Approach

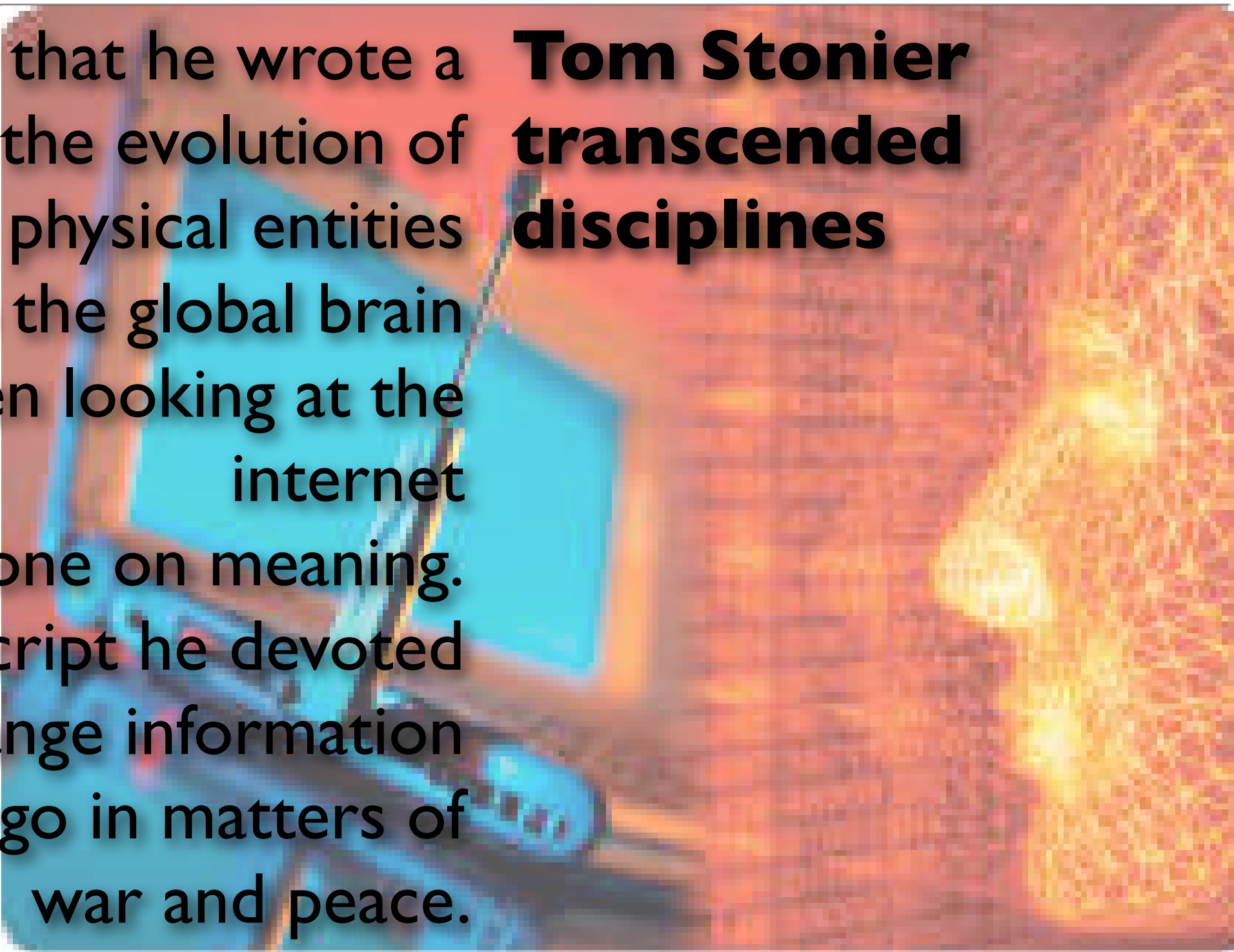


- When he began to dive into the foundation of information topics, he started with economy where he found out that economists were ignorant about the essence of information.
- He then began to elaborate on the physics of information and published a book well reviewed by physicists.

**Tom Stonier  
transcended  
disciplines**



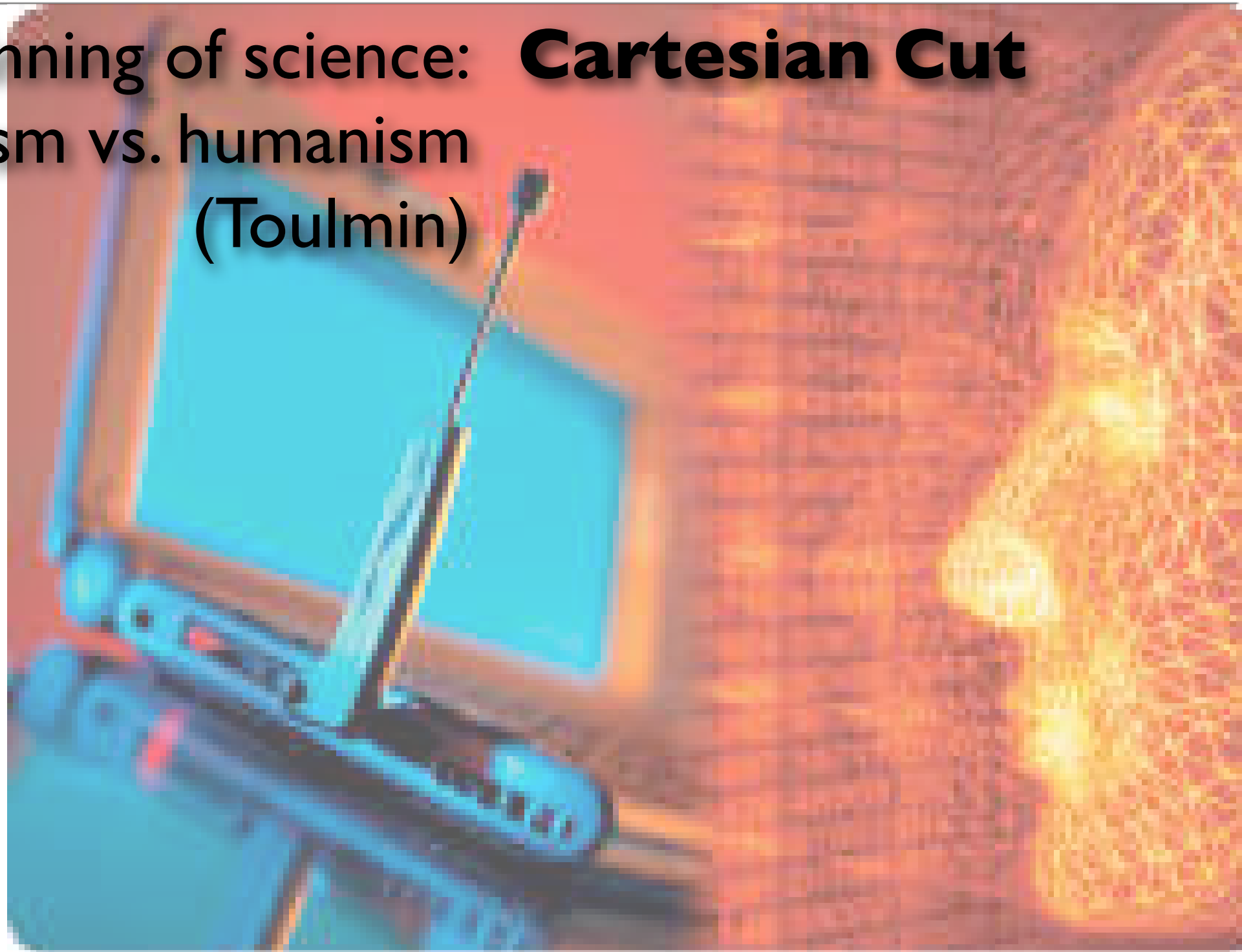




## **Tom Stonier transcended disciplines**

- After that he wrote a monography on the evolution of intelligence from physical entities to biotic ones to the global brain he envisaged when looking at the internet
- and another one on meaning.
- His last manuscript he devoted to the change information societies undergo in matters of war and peace.

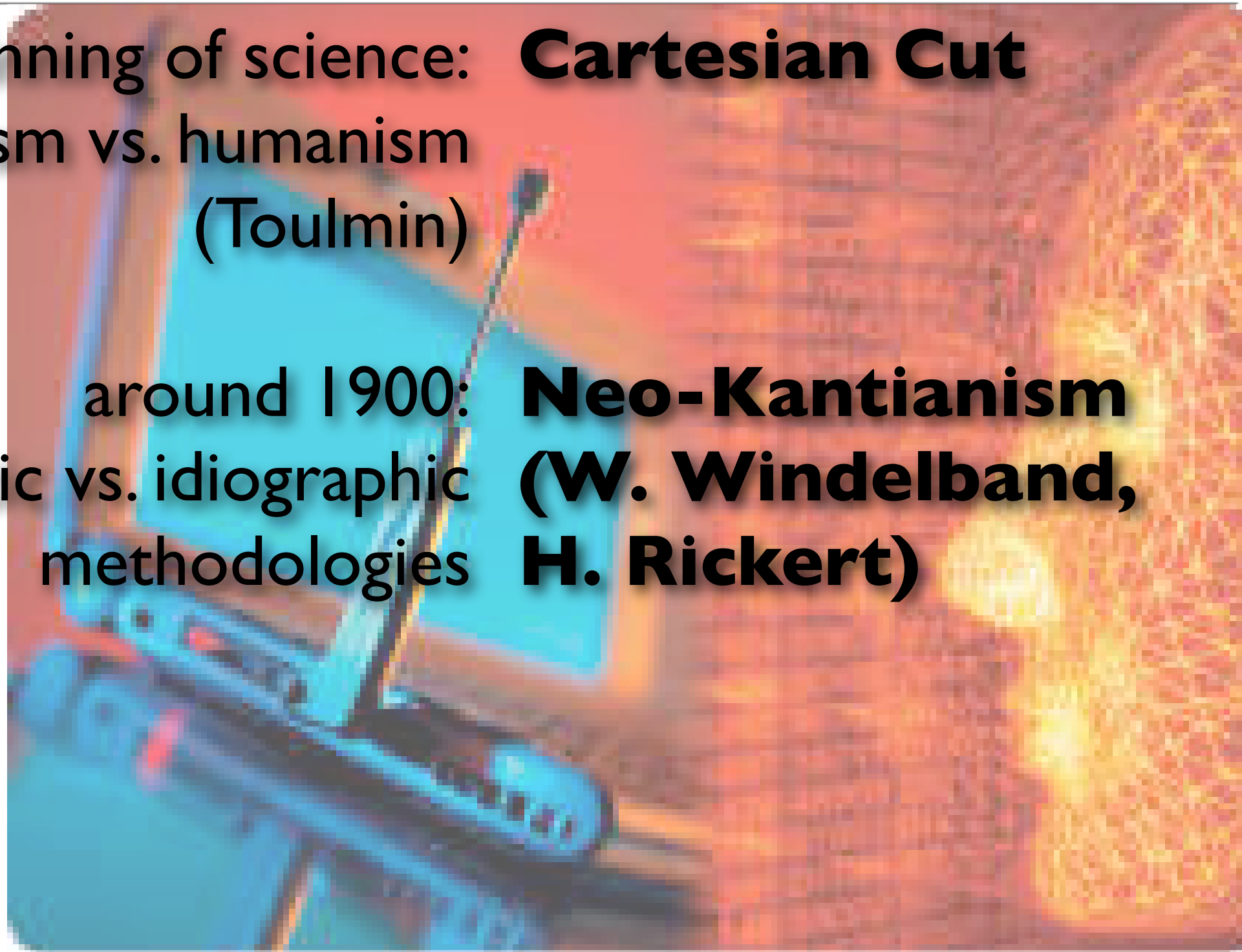
since the beginning of science: **Cartesian Cut**  
rationalism vs. humanism  
(Toulmin)





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rationalism vs. humanism  
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around 1900: **Neo-Kantianism**  
nomothetic vs. idiographic  
methodologies **(W. Windelband,  
H. Rickert)**



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1959/1963: **C.P. Snow's Two**  
(natural) science vs. humanities **Cultures**



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**Neo-Kantianism  
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1959/1963:  
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late nineties:  
US-american popular science

**J. Brockmann's  
Third Culture**

In order to cope with complexity  
we have to avoid 2 shortcuts:







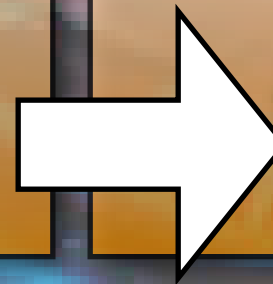
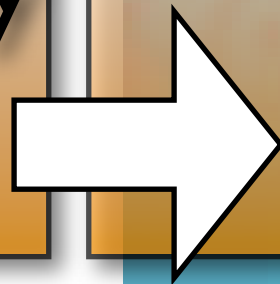
reduction to simple laws  
(deduction of complex  
phenomena)

# I Reductionism (methodological)

physics,  
chemistry

life sciences

social  
science,  
humanities





projection of complex laws  
onto simple phenomena

## 2 Projectionism

physics,  
chemistry

life sciences

social  
science,  
humanities







Instead, we are in need of **transdisciplinarity.** **Unity-through-diversity**

*cross-disciplines:  
information science,  
evolutionary theory,  
systems theory*

physics,  
chemistry

life sciences

social  
science,  
humanities

any method useful for researching the conditions crucial for designing a sustainable global information society

# The information science approach

