

Concept of mind and brain in traditional Chinese medicine

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Traditional Chinese Medicine (TCM) has lately attracted considerable attention due to its effects on various diseases including intractable diseases.

A case of giant verruca;
which could not be cured by
treatments of western medicine
for 30 years



After
Herbal
treatments



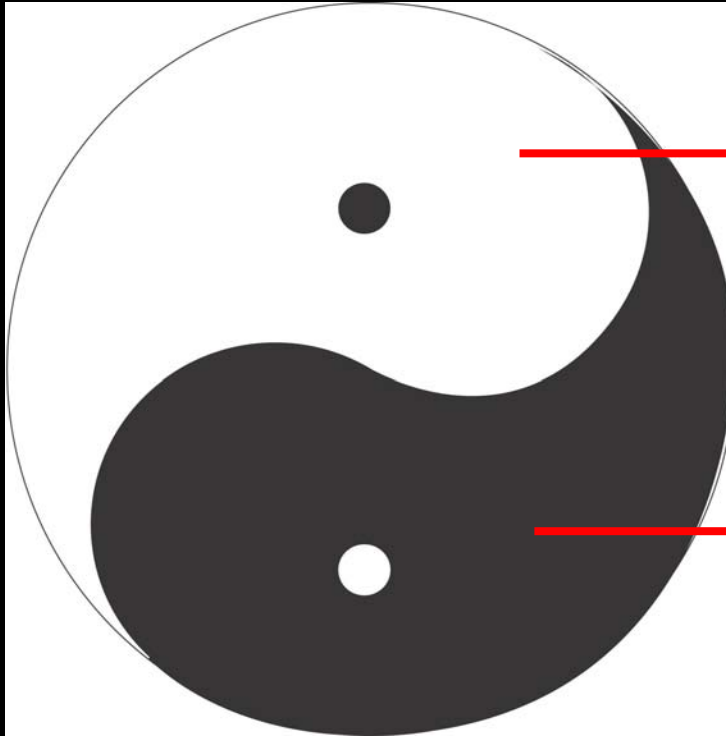
- In contrast to the effects of TCM treatments, the theory of TCM based on Yin-Yang and the five elements has attracted less attention in current research on TCM, since Yin-Yang and the five elements theories are ancient Chinese philosophies which are considered incompatible with modern science.
- However, they may provide us with some new insights into human health and disease. In this paper, I will compare the characteristic view of human beings in TCM with that of western medicine.

TCM is based on
the ancient Chinese philosophies:

- Ying-Yang theory
- Five elements theory

Yin-Yang theory

Tai-Chi symbol



Yang

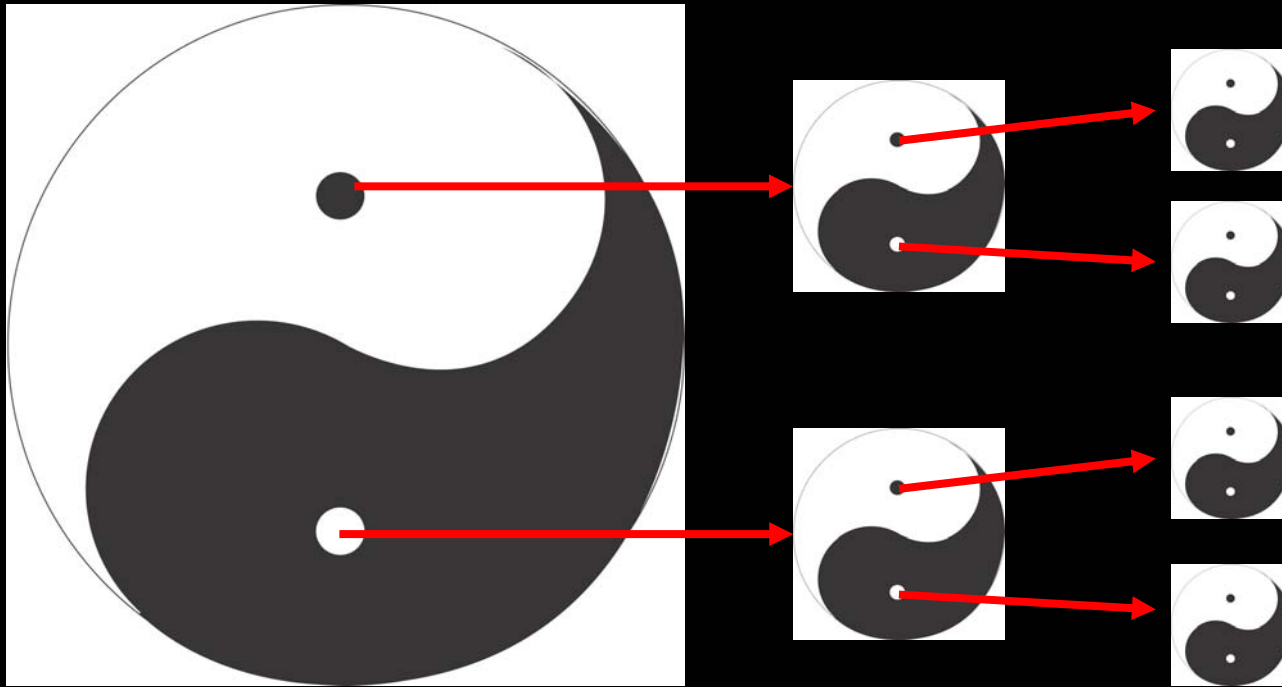
(fire, day, hot, etc.)

Yin

(water, night, cold, etc.)

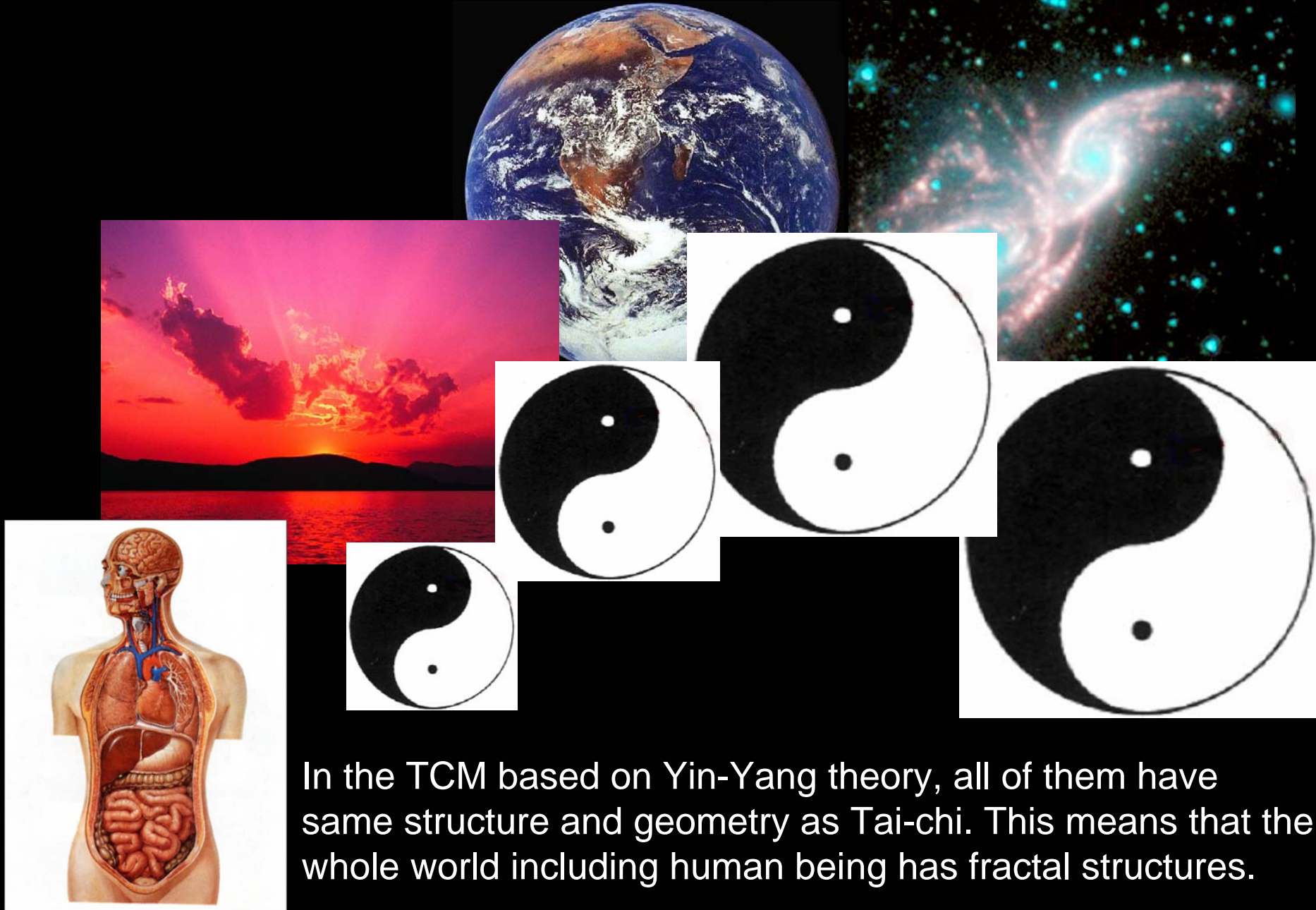
The whole idea of Yin-Yang theory is expressed by the Tai-Chi symbol. The black and white areas in Tai-Chi symbol means that the whole world, including human beings, consists by two opposing components, namely, Yin (black area) and Yang (white area).

Tai-Chi symbol



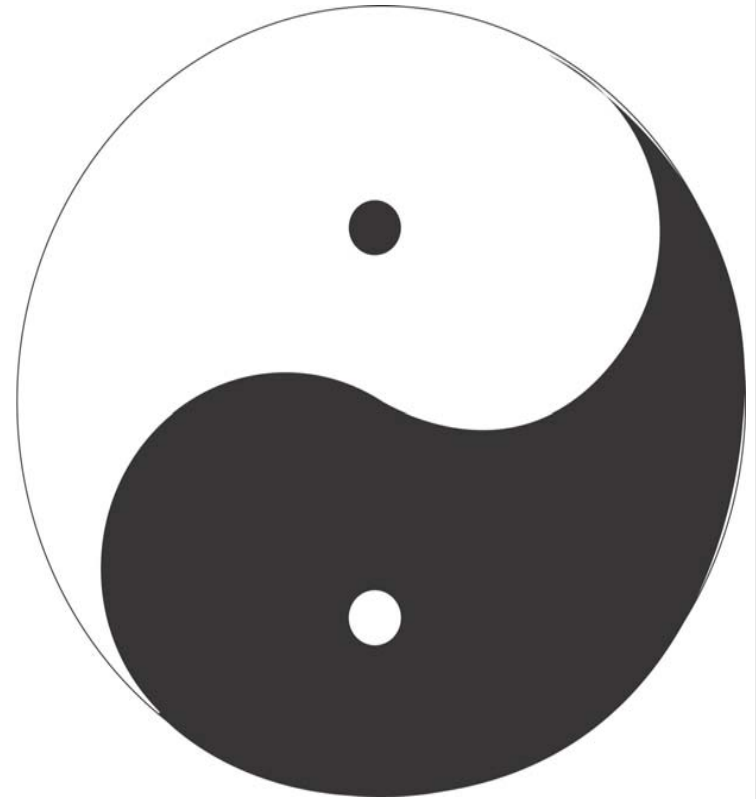
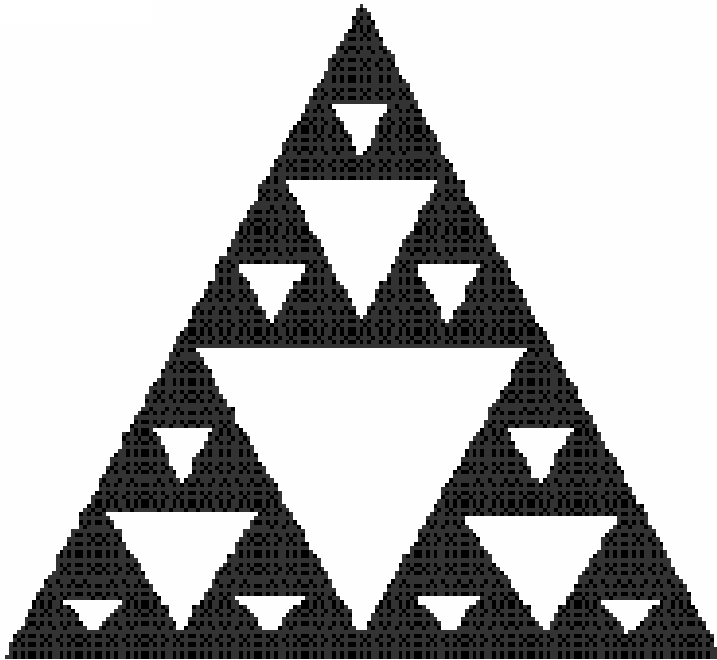
Importantly, each component exists within the other component; the white and black areas contain small black and white circles, respectively. This means that Yin/Yang is a relative concept, and each part has a similar structure to the Tai-Chi symbol. Therefore, the world is considered to be infinitely divided into Yin and Yang.

What view of the World in TCM?



In the TCM based on Yin-Yang theory, all of them have same structure and geometry as Tai-chi. This means that the whole world including human being has fractal structures.

Sierpinski triangle



If the black part is Ying, and the white part is Yang, Sierpinski triangle and Tai-Chi symbol are same in meaning.

“Anatomy” of human body in TCM



Yin	Yang
interior	exterior
anterior	posterior
abdomen	chest
five <i>zang</i> organs	six <i>fu</i> -organs

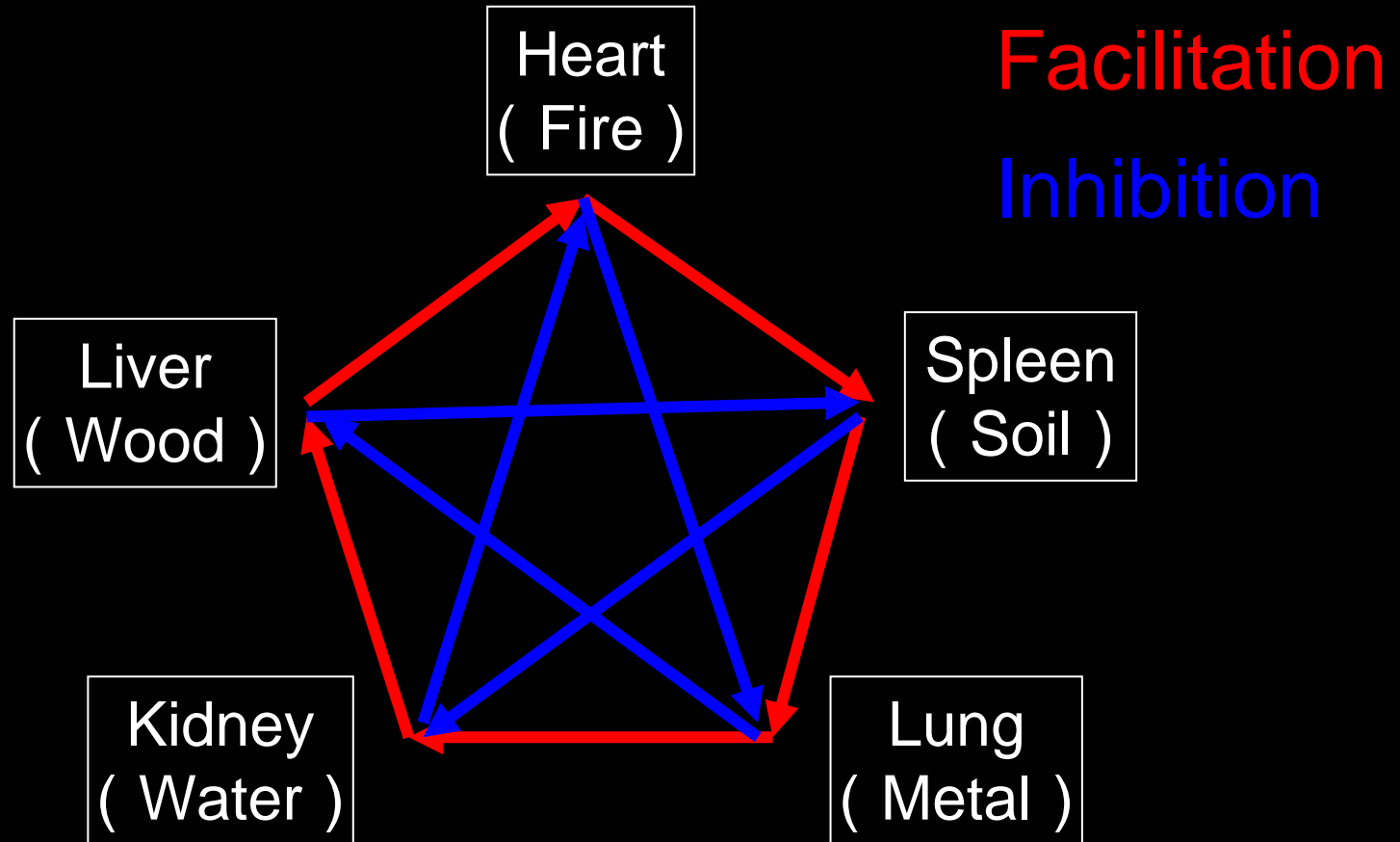
In TCM, any parts of human body are classified to Yin or Yang. For example, interior, anterior, and abdominal parts of human body, and five zang-organs are classified to Yin, while exterior, posterior, chest, and six fu-organs are classified to Yang. Therefore, human body is consisted with many Tai-Chi, and fractal structure.

Five elements theory

1) The world is composed of five elements; wood, fire, soil, metal, and water.

2) Each component interacts each other to maintain balance of the whole system.

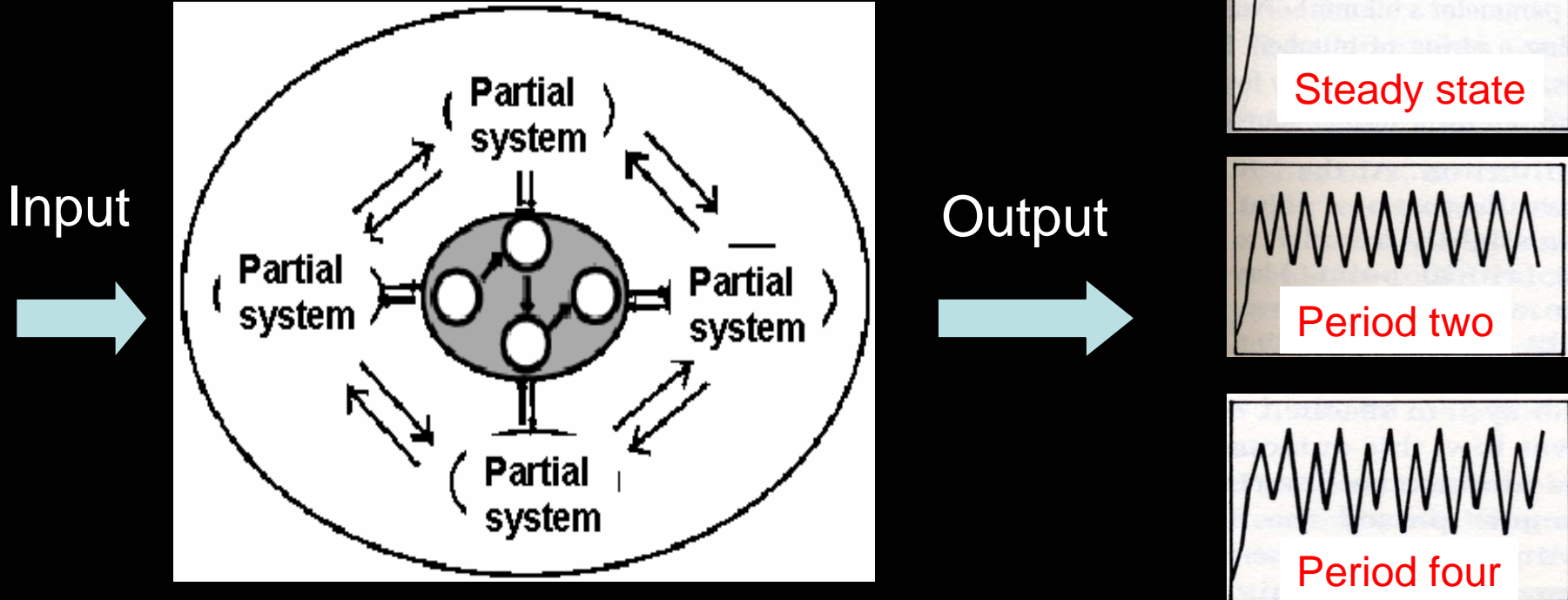
Interaction between the five elements



This figure summarizes the interaction between the five elements. Each organ classified to the five elements. The red and blue vectors indicate facilitation and inhibition effects on the target organs, respectively. This figure resembles mathematical models of biological system.

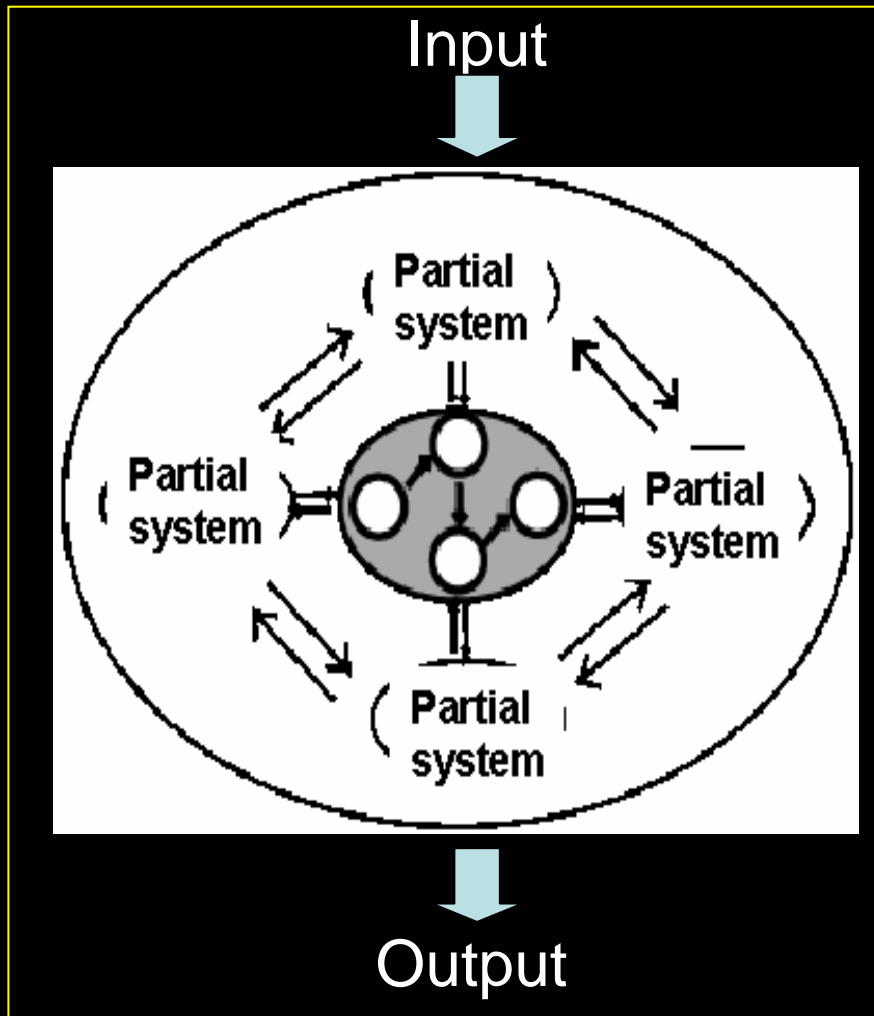
Biological model based on Chaos theory

(by Dr. K. Gohara)

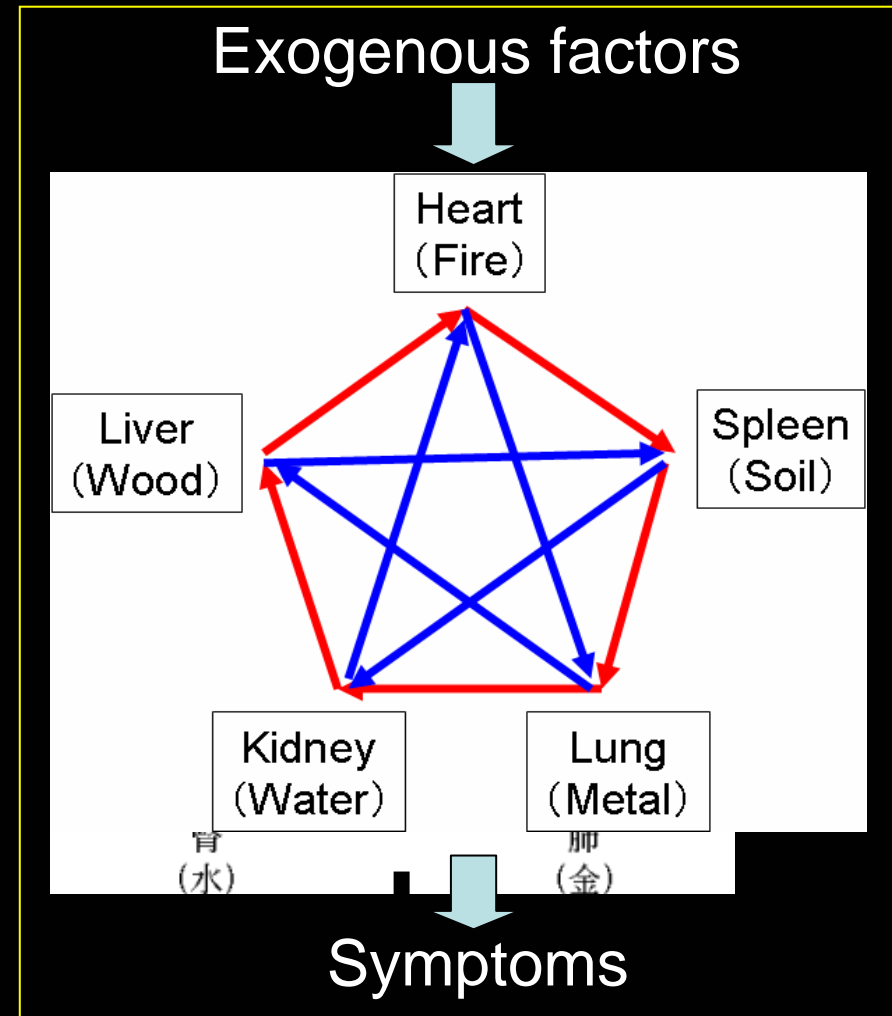


This is a mathematical model of biological system based on Chaos theory, which is composed by several partial systems. The input signals are processed by interactions among each partial system. When the parameters of the partial systems are changed, the output signals changes from steady state to period two, four, and chaos.

Biological model based on Chaos theory



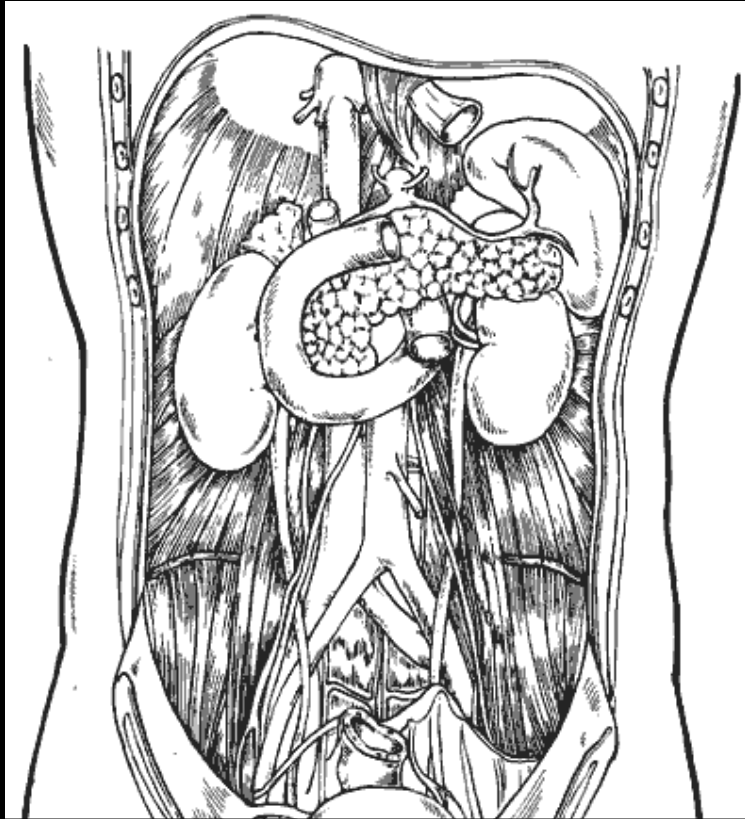
TCM



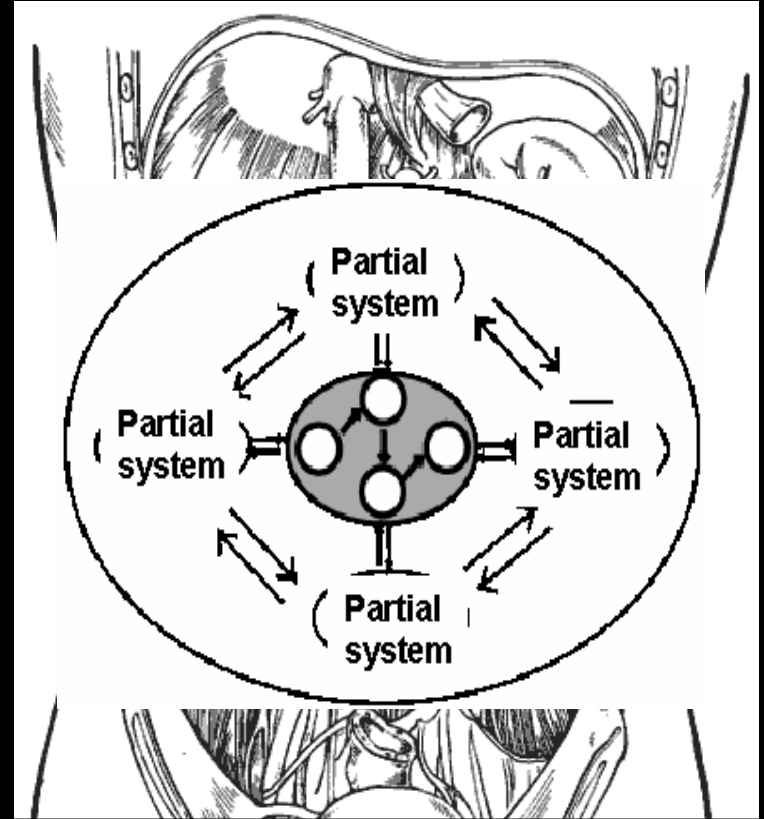
In the TCM model, the exogenous factors are processed by interactions between the five zang-organs, resulted in various symptoms. When we assume the five zang-organs are the partial systems, the TCM model is similar to the biological model .

Differences in basic principles between Modern Western Medicine and TCM

Modern Western Medicine



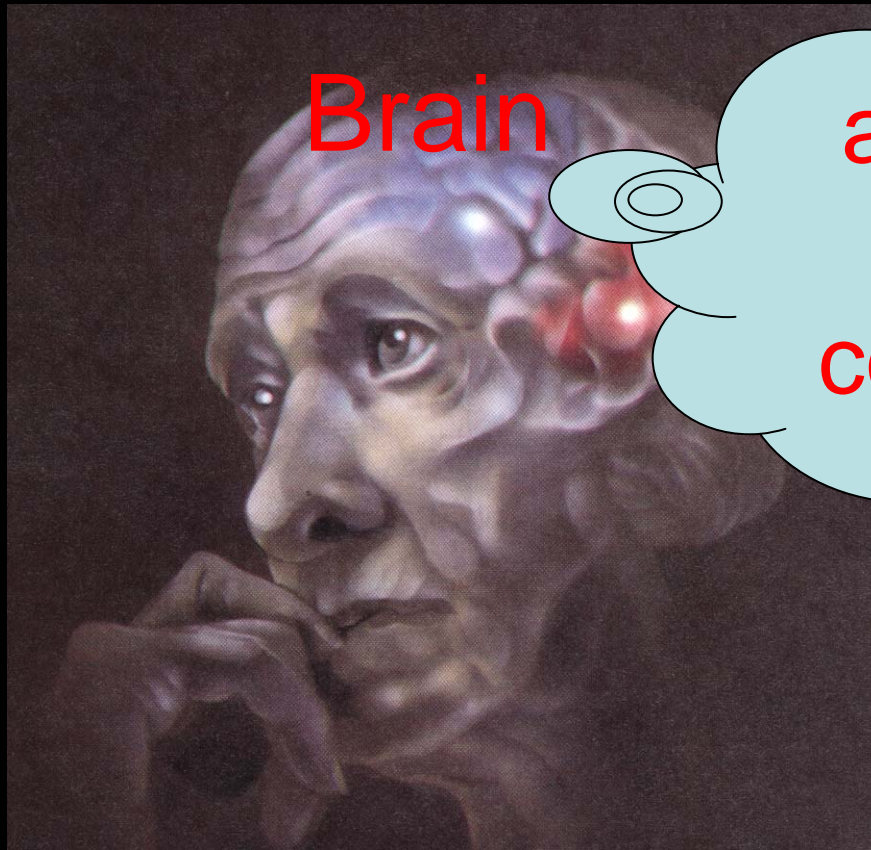
TCM



Modern western medicine has been developing based on the anatomy, while TCM attached greater importance to function than to structure (i.e. anatomy), and is likely to regard the human body as a dynamical system.

Concept of mind and brain in TCM

Modern Western Medicine



Brain

arose Mind
+
control body

In Modern Western Medicine, the brain is the most important organ, which arouse mind and control body.

Organs in TCM

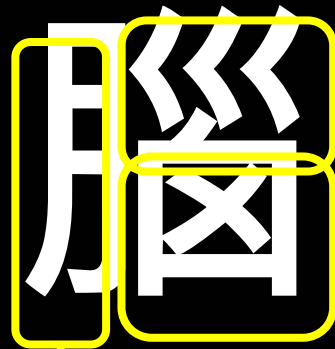
Five *zang-organs* = heart, liver, spleen, lung, kidney

Six *fu-organs* = gallbladder, stomach, small intestine,
large intestine, bladder, triple-warmer

The brain is not included in the organs of TCM!

Ancient TCM doctors did not recognize the brain?

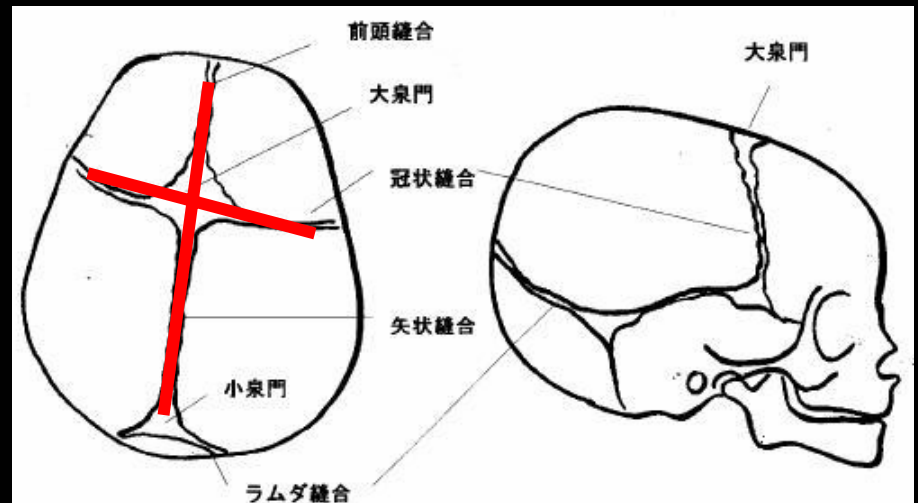
Chinese character
of the “brain”



Hair

Neonatal skull bone

Organs



Therefore, ancient TCM must know the existence of the brain. However, they had excluded the brain from the organs, probably due to complex functions of the brain.

How to make a diagnosis of a patient with brain diseases without the brain?



TCM diagnosis

- 1) Decrease of *qi* in the spleen
- 2) Decreases of *yin* in the liver and kidney



Q: How to control motor functions without the brain?

A: Five *zang*-organs control motor functions!

Liver (Wood)



Supply blood
to tendons

Heart (Fire)

Spleen (Soil)



Supply *qi* (vital energy)
to muscles

Lung (Metal)

Kidney (Water)

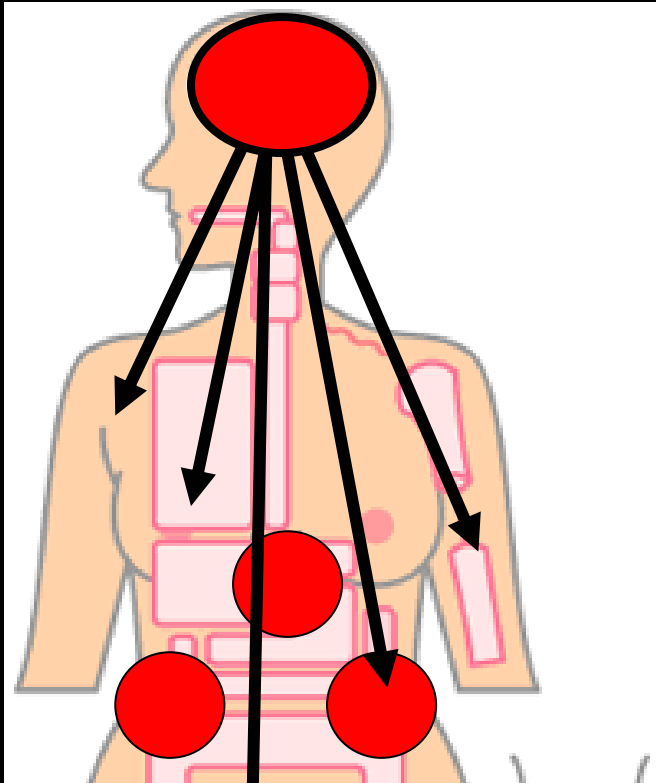


Develop bones

Five *zang*-organs arouse various emotions in TCM

Liver (Wood)	➔	Angry
Heart (Fire)	➔	Happiness
Spleen (Soil)	➔	Thinking
Lung (Metal)	➔	Melancholy
Kidney (Water)	➔	Fear

Differences in brain functions between western medicine and TCM



Western Medicine:

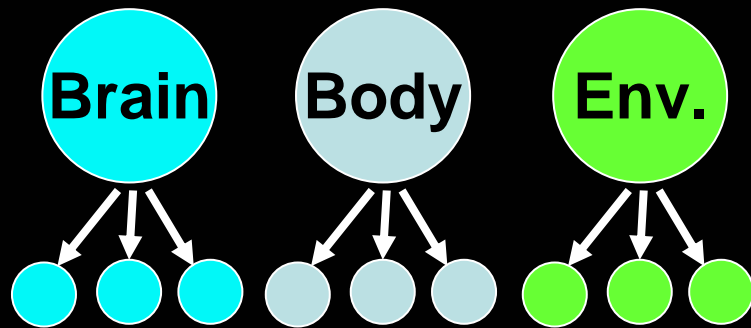
The brain arouses mind & emotion, and controls the human body.

TCM:

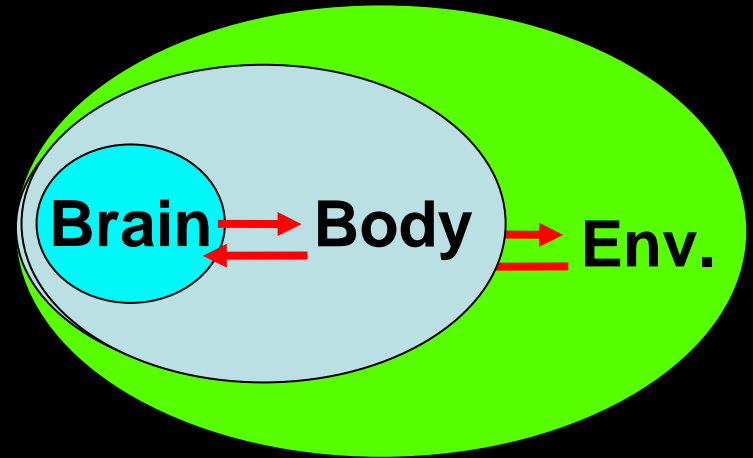
The brain functions are scattered over the human body such as five-*zang* organs.

Brain diseases are regarded as systematic diseases in TCM, and their treatments are aimed to normalize not only the activity of the organs, but also the balance of functional interaction.

Western Medicine based on “Reductionism”



Future Medicine based on TCM and dynamical models



Modern western medicine has been developing based on reductionism. In contrast, TCM regards complex systems as irreducible or holistic things, and puts great stress on functional interactions in complex systems including human body and environments.

Future medicine based on TCM and dynamical models may provide new paradigms for preventing medicine and health promotion.

Conclusion:

TCM had co-opted the basic idea of a complex system for the diagnosis and treatment of human diseases thousands years ago. Research into TCM should not only evaluate the effects of herbal medicine or acupuncture, but should take into consideration the view of human beings in TCM. Such studies may help us to understand disease in terms of the relationship between humans and the environment.

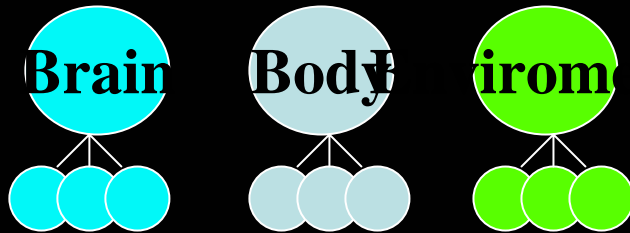


「泣く女」
パブロ ピカソ
1937年

Modern Western Medicine

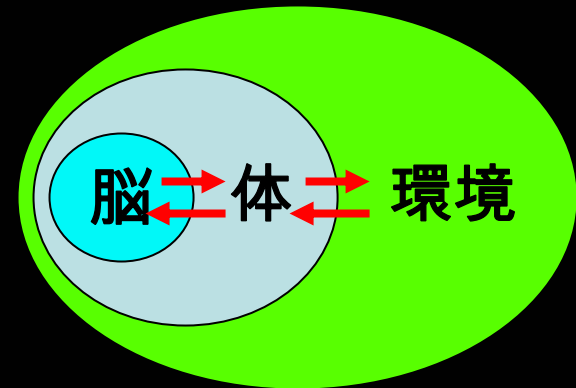
TCM

Based “Reductionism”
(機械論パラダイム)



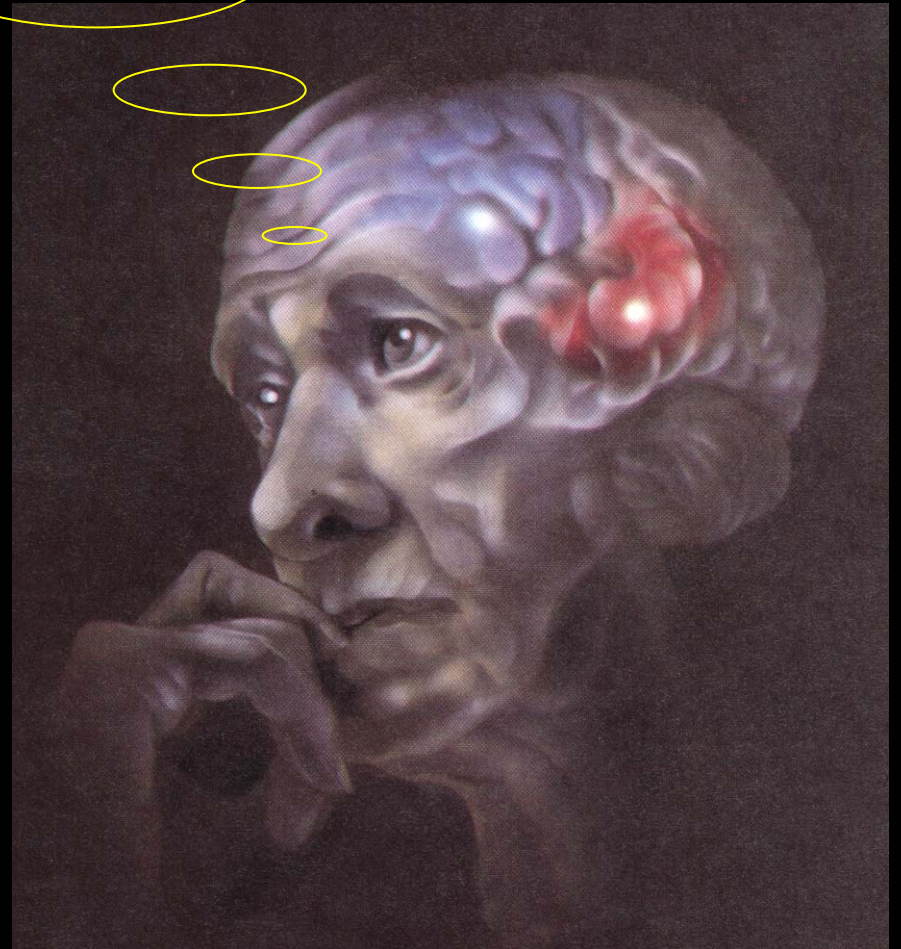
各要素に注目
決定論的
部分の和が全体

Based on “Holism”
(カオス論パラダイム)



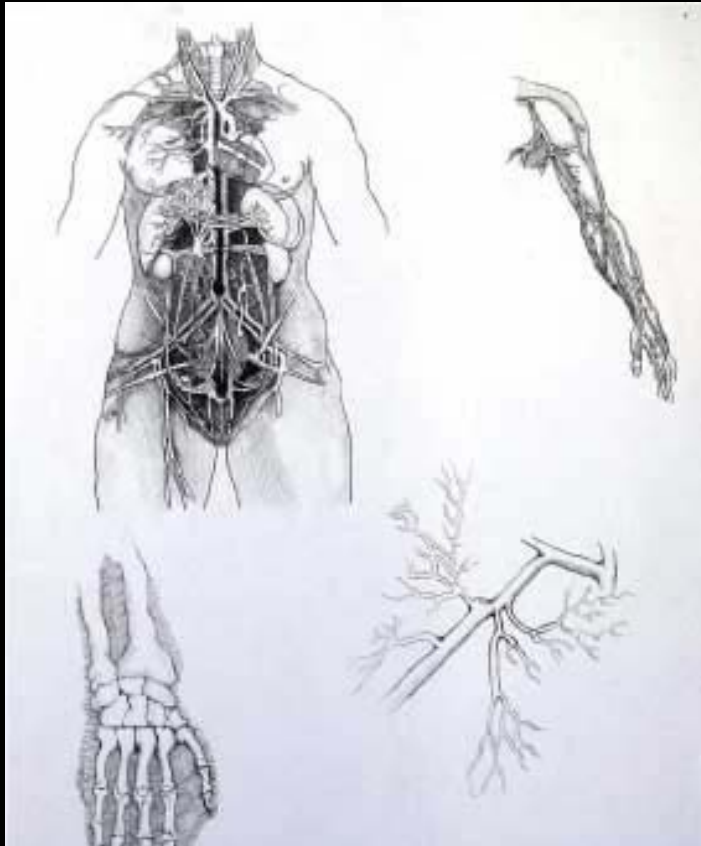
要素間の関係に注目
カオス的
非線形系・非平衡状態

西洋医学と何が異なるのか？

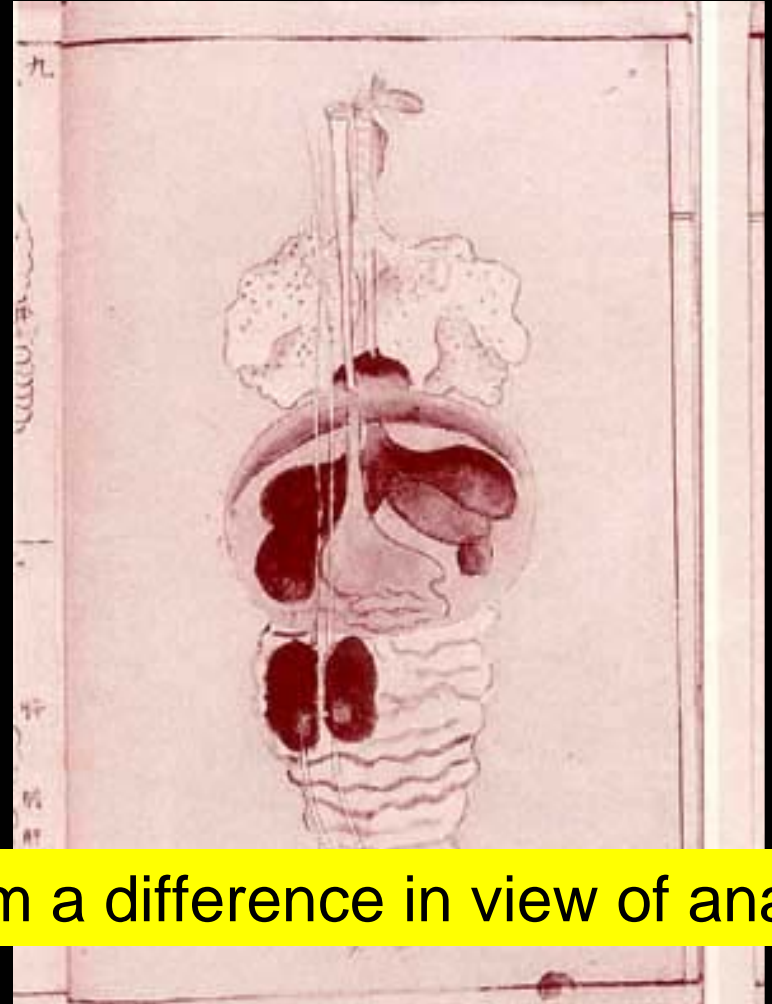


Differences in view of anatomy between the west and east

Leonardo da Vinci
(1 4 5 2 — 1 5 1 9)



Text of Anatomy in Japan
(1 7 5 6)



Such a difference might arise from a difference in view of anatomy