

**Five Factors of cell's metabolism
(Oriental philosophy in light of Western knowledge)**

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1. Five Elements and equilibrium.

The whole Oriental philosophy is permeated by theories of Yin-Yang and the Five Elements. What are their relations to our matter world?

Let's try to create the model of some processes based only on Five parameters.

We take separate object in the space. It is supposed the object consist of two small conjugated cubes and common verge is a membrane with a small hole in the middle of the verge (Fig. 1).

We assume between cubes there is energy interchange via hole in the membrane.

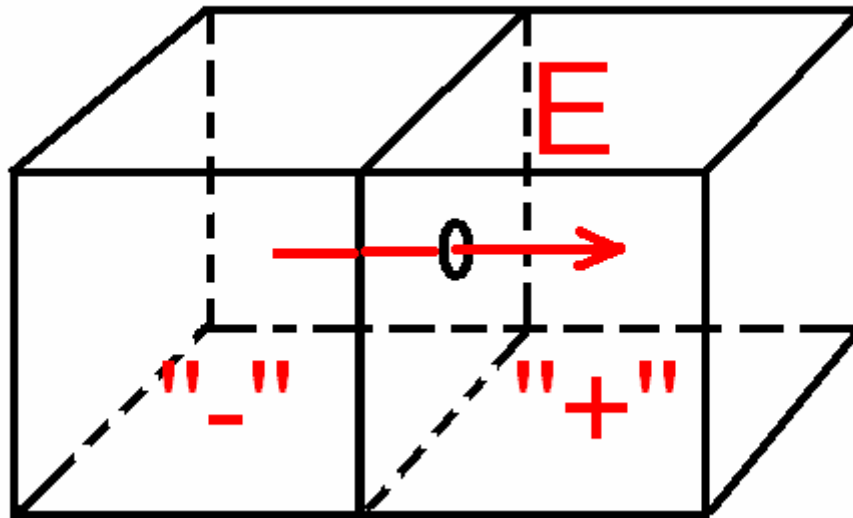


Fig. 1

In spite of Energy moving inside, the object itself saves the form. It means moving energy also has equilibrium with environment, i.e. the object has dynamic stability in the space.

At constant outer pressure the dynamic stability in the object can be reached only at complete absorption of energy of vector directed from left cube into the right one.

In our three dimensional space, the E vector is sum of five vectors in left cube and at the same time the sum of five vectors in right cube. All vectors at each cube are independent because they are placed at arrows of Cartesian System of coordinates (Fig. 2).

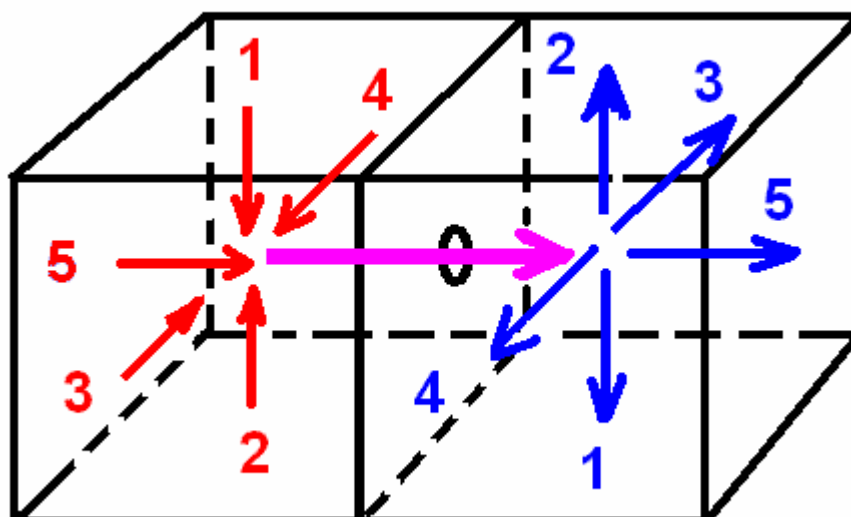


Fig. 2

Thus, vector's form of stability of the object can be described by equation as follow:

$$\mathbf{E \ outflow} = \mathbf{1 + 2 + 3 + 4 + 5}$$

$$\mathbf{E \ inflow} = \mathbf{1 + 2 + 3 + 4 + 5}$$

$$\mathbf{E \ outflow} = \mathbf{E \ inflow}$$

$$\mathbf{1 + 2 + 3 + 4 + 5 = 1 + 2 + 3 + 4 + 5} \quad (1)$$

Vectors form Five pairs on the base of most accurate correspondence of phases of inflow and outflow of Energy.

When directions of moving energy are changed, paired vectors also will alter their trends. This ideal model of moving Energy is extreme form of organized energy flows. It gives conception regarding vector's structure of flowing energy for closed room and it is applicable for any object in three dimensional space.

The equation (1) gives a chance to discuss about 10 objects, which birth 10 vectors of energy, i.e. from the point of view of phases of absorption and irradiation of energy only 10 objects have a right to exist. Only at balance of 10 objects the energy stability is possible. Ideal balance is supposed as equation of absorbed and irradiated energy at every small period of lifetime.

Changing of character of energy use by each of 10 objects provides continuity of Energy moving, accurate balance between free moving quantity of energy and concentrated Energy inside objects. These objects of acceptors and donors of energy are supposed as channels in Traditional Chinese Medicines. The channel has the same construction as an object where the channel is placed. It means channels also

have two cubes (Yin-Yang pair) and **Five** small objects at each cube. Thus, hierarchy symmetry is saved for every level of Universe.

Term “Element” should be applied exactly to acceptors and donors of energy.

2. The Periodic Table of chemical elements.

The world where we are living is relatively stable. When we go to the bed at evening, at morning we usually find buildings, mountains, rivers and roads at the same place. From the other side, each atom of the matter has huge quantity of energy and a couple kilograms of the matter can during a second change the landscape tremendously. This possibility was clear demonstrated in Japan during Hiroshima and Nagasaki bombing at 1945.

What is the cause to set the matter so calm?

- It is the same principle of dynamic stability, when inner interaction of 10 channels (Elements) have a very sophisticated and accurate conjugation of processes of irradiation and absorption of energy inside atom's structure.

At the same time all atoms and molecules forms matter world with relatively high stability. It means atoms and molecules are also coordinated from point of view of absorption and irradiation of energy. There are rhythmic periods of inflow and outflow of energy per each chemical element. Parameters of rhythms are the main powers of chemical interactions.

Every chemical element is aspiring to get the place in the space when oscillation of outer energy is resonant to energy movement of element.

The more complete is correspondence, the more solid are connections in result of chemical reaction. Absolute correspondence creates inert matter – inner energy is well organized and it not depends on environment.

If we look at our planet, it is possible to go to conclusion that sum of all oscillation of all elements are synchronized at a very accurate manner. Imagine the nuclear bomb at size of our planet and any hurricane or volcano eruption will become as light ripples in ocean of energy.

On the base of structural analogy we can make conclusion there are also ten channels in the body of our planet. It means any chemical element can be sorted on the base of principles of Five phases and these phases provide stability at level of our planet.

3. The body as a small Universe.

Chemical reactor of our bodies also has Five – phase’s structure (ten channels of irradiation and absorption of energy).

The Five phases structure among chemical elements in living organism was indirectly proved by research work of Russian doctor Alexander Samohotsky (1890-1986)(1*).

He was found the health state is depending only on Five factors: concentration in blood of ions of sodium (Na⁺), calcium (Ca⁺), magnesium (Mg⁺), potassium (K⁺) and reduction-oxidation (Red Ox) potential. The Red Ox potential has very close connection to pH balance and we can make a conclusion the fifth factor is concentration of hydrogen (H⁺) ions. Doctor Samohotsky had made a lot of clinical experiments and by his method almost all his hard patients were treated to the health state. Also it was revealed there are no infections can penetrate in the body if the blood has balanced concentration of ions of Five Factors. Doctor Samohotsky had not used sterilized springs and scalpels and he horrified colleagues and patients by this fact.

ANY disease could be treated by Dr. Samohotsky by injection of mixture of above mentioned factors on the base of blood analysis of concentration of ions of Na⁺, Ca⁺, Mg⁺, K⁺ and H⁺ only. The injection was made to balance Five Factors to proper concentration and patient recovered very quickly (during 3-10 injections).

1* - The dissertation copy “Experience of searching of treatment regularity” (1946) was deposited in Research Institute of Healthcare Ministry of the USSR No D-14130-87, the abstract was printed in “Medical abstracts journal” at 1987, No 11, chapter IX, publication No 1754.

4. Translation of Samohotsky factor to Oriental system of the Five Elements.

In traditional Chinese Medicine together with the theory Yin-Yang (describing processes of irradiation and absorption of Energy) the Law of Wu-Xing exist.

The main meaning of hieroglyph “Xing” is verbal, functional. Literally it means “Five movements”, “Five shifts”, “Five make steps”. In traditional Chinese Medicine these five substances are described by symbols as follow: Wood, Fire, Earth, Metal, and Water. By other words, five substances are described energy processes of irradiation and absorption of energy at time scale.

The main peculiarity of Wu-Xing is fact that any regular process is closed cycle of order of five processes. These Five processes have mutual interrelation at two stages – mutual stimulation and mutual suppression. Five processes form stable and relatively independent on environment object. It means the object can not exist apart of five processes. If any of five processes is stopped, the whole object loses off the entity, disappear as a whole thing.

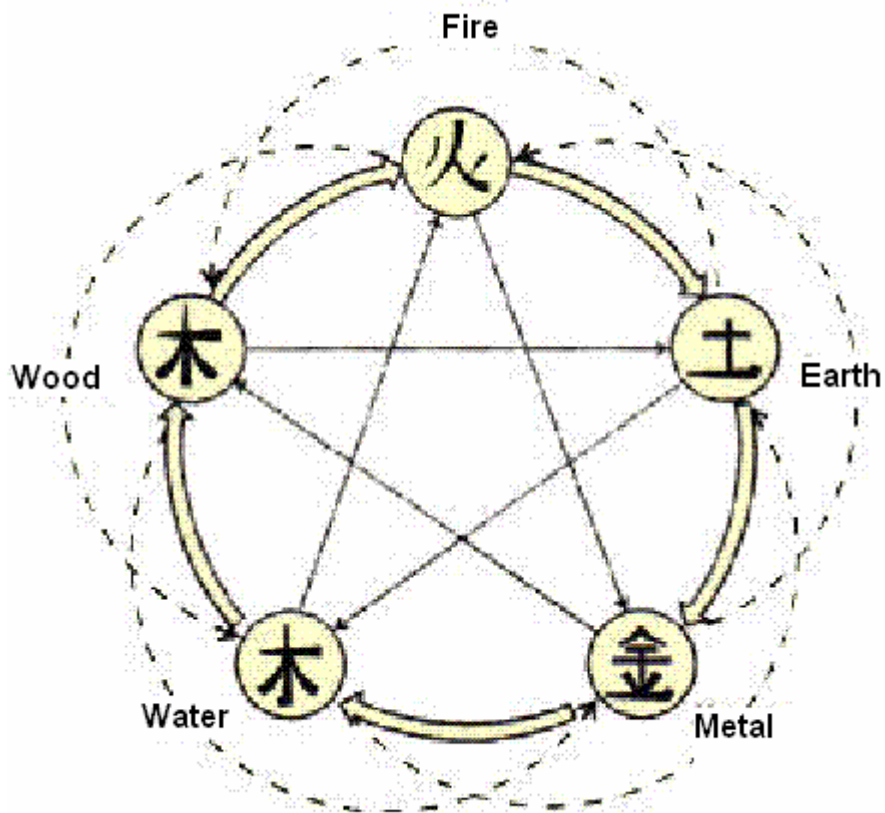


Fig. 3

The main Wu—Xing cycle laws are described by orders as follow:

- Order of mutual birth: Wood berth Fire → Fire birth Earth → Earth birth Metal → Metal birth Water → Water birth Wood;

- Order of mutual suppression: Wood suppresses Earth → Earth suppresses Water → Water suppresses Fire → Fire suppresses Metal → Metal suppresses Wood.

Correlations of the Five processes (Phases, Elements) with different processes in nature are described in Traditional Chinese philosophy by the next table:

	Wood	Fire	Earth	Metal	Water
Orientation	East	South	Middle	West	North
Season	Spring	Summer	Late Summer	Autumn	Winter
Climate	Wind	Summer Heat	Dampness	Dryness	Cold
Cultivation	Germinate	Grow	Transform	Reap	Store

Yin Organ	Liver	Heart	Spleen	Lung	Kidney
Yang Organ	Gall Bladder	Small Intestine	Stomach	Large Intestine	Bladder
Orifice	Eye	Tongue	Mouth	Nose	Ear
Tissues	Tendons	Vessels	Muscles	Skin & Hair	Bones
Emotions	Anger	Joy	Pensiveness	Grief	Fear
Colour	Blue/ Green	Red	Yellow	White	Black
Taste	Sour	Bitter	Sweet	Pungent	Salty
Voice	Shout	Laugh	Sing	Cry	Groan

Let's try on the base of above mentioned information to confront Samohotsky factors with the Five Elements system.

It is more easily to confront Red Ox potential with Wood Element (equivalent of sour taste to excess of hydrogen's ions H^+).

The second factor is correlation of Water Element (salty taste) with concentration of ions Na^+ .

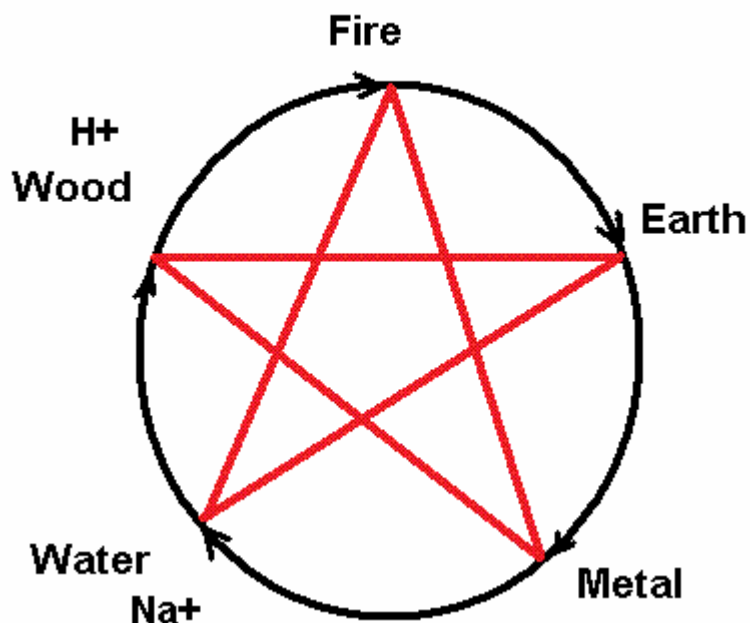


Fig. 4

To find more bases to connect Samohotsky's factors with other Elements we should use information from acupuncture theory, where acupuncture channels are associated into 6 segments:

Tai Yin – Lungs and Spleen, Elements of Metal and Earth;
Shao Yin – Heart and Kidneys, Elements of Water and Fire;
Jue Yin – Liver and Pericardium, Elements Wood and Fire-Minister (Fire minister is cumulative Element which present Five Elements before environment);
Shao Yang – Gall Bladder and Tripple Burner, Elements Wood and Fire-Minister;
Tai Yang – Urinary Bladder and Small Intestine Elements of Water and Fire;
Yang Ming – Large Intestine and Stomach, Elements of Metal and Earth.

Here we can see interrelation between Water and Fire and Metal and Earth Elements.

What types of interrelations are possible? From biophysics of Western medicine we know about theory of ionic sodium-potassium pump. Thus, we can connect concentration of K^+ ions with Fire Element.

The rest two factors Ca^{++} и Mg^{++} we should divide between Metal and Earth Element. In accordance with above mentioned table the Earth is connected with dampness, but Metal with dryness. From general medical practice it is well known fact that medication by Ca^+ cause constipation (dryness), but high dosage of Mg^+ lead to diarrhea. Thus, we can confront Ca^+ to Metal Element and Mg^+ to Earth Element.

As a result, Samohotsky factors will be placed at Wu-Xing cycle in order as follow:

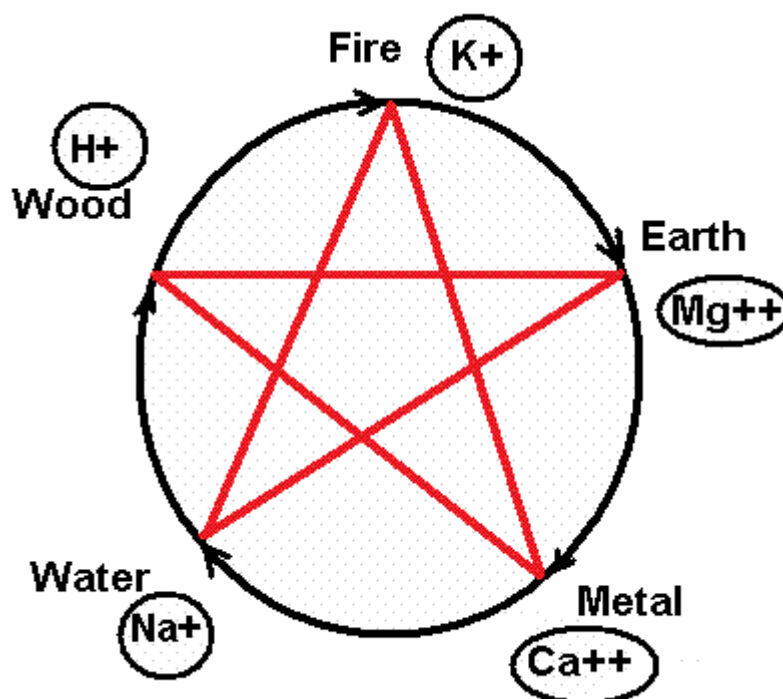


Fig. 5

5. Translation of Samohotsky's factors and Five Elements onto metabolic process of a cell.

Here we use models of Western medicine in area of diagram of electro potentials at surface of cells:

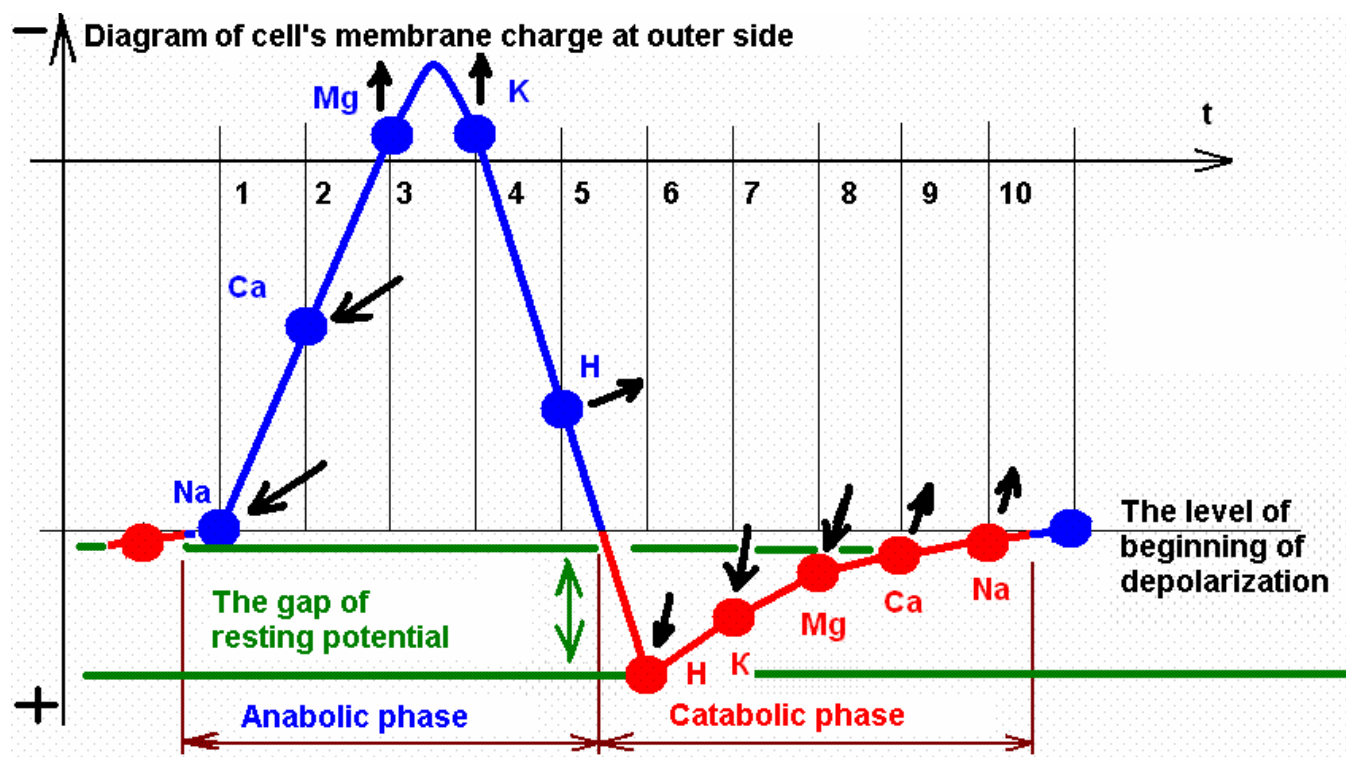


Fig. 6

Explanations to Fig. 6:

* black arrows are directed inside red and blue circles – in means ions start moving inside the cell;

* black arrows are directed from red and blue circles - in means ions start moving outside the cell.

- Modern biophysics postulate inner part of cell's membrane has negative charge owing to excess of hydrogen ions at intercellular space (phases 6-10 at Fig. 6), the volume of membrane charge is called as resting potential.

- As hydrogen concentration is gradually decreases at intercellular space, the resting potential is decreased also before point ALL OR NOTHING will be reached. It means gradual decrease of hydrogen ions is impossible and avalanche-like processes of ions movement start to flow (Phases 1 - 5).

- the avalanche-like processes of ions movement starts at quick decrease of membrane penetration for Na^{++} ions – **phase 1** at Fig.6. Ions of Na^{++} start movement into cell. Movement is accompanied by transportation of fragments of alimentary substrate, quick depolarization of membrane charge – positive charge outside of cell decreases considerably.

Hereafter we will use circulation scheme of the Five Elements. Traditional Oriental Philosophy states the circulation clockwise. But the first step to Na⁺ means movement contra clockwise (if the first step is considered decrease of H⁺ ions). It is the **phase 1**.

- Following to logic of circulation, the **phase 2** should be corresponded to beginning of Ca⁺⁺ ions movement from intercellular space into cell alongside of concentration gradient. Ca⁺⁺ ions also are accompanied by movement of alimentary substrate into cell and at the same time the depolarization of membrane increases more intensively.

- at **phase 3** take place activation of movement of Mg⁺⁺ ions outside cell. There are also processes of excretion of metabolic products. The speed of depolarization become slower, flow of Mg⁺⁺ ions outward of cell compensates penetration Na⁺ and Ca⁺⁺ inside cell. Negative charge at outer part of membrane is stabilized for a short time.

- at **phase 4** K⁺ ions start movement outward the cell. Membrane at outer part of cells became positive.

- at **phase 5** channels of ions of hydrogen are opened and ions H⁺ move outward the cell. The membrane increase positive charge at intercellular space. Between 5 and 6 phases the process of anabolism changes to process of catabolism. Now the cell has a store of energy in form of ATP and can fulfill work.

- at **phase 6** hydrogen ions concentration has maximum. Hydrogen starts gradual movement into cell. There is process of preparation to the next period of anabolism. As a result about 40% of stored energy will be spent to provide by energy ionic pumps to support positive charge of membrane at outer part of cell and compensate leakage of hydrogen ions into cell. Positive charge of membrane assist to oxidation processes in cell, ions start moving in accordance with clockwise direction in Wu-Xing cycle. The Yang process (catabolism) has a place.

- at **phase 7** start work potassium ionic pump. It moves ions of K⁺ into cell.

- at **phase 8** start work magnesium ionic pump. It moves ions of Mg⁺⁺ into cell.

- at **phase 9** start work calcium ionic pump. It moves ions of Ca⁺⁺ out of cell.

- at **phase 10** start work sodium ionic pump. It moves ions of Na⁺ out of cell.

At **phase 1** the power of ionic pumps is depleted. The H⁺ concentration at intercellular space is decreased considerably, Na⁺ inward channels open and new cycle of anabolism begin. The membrane again is depolarized, new molecules of ATF are constructed and energy is stored.

6. Some conclusions.

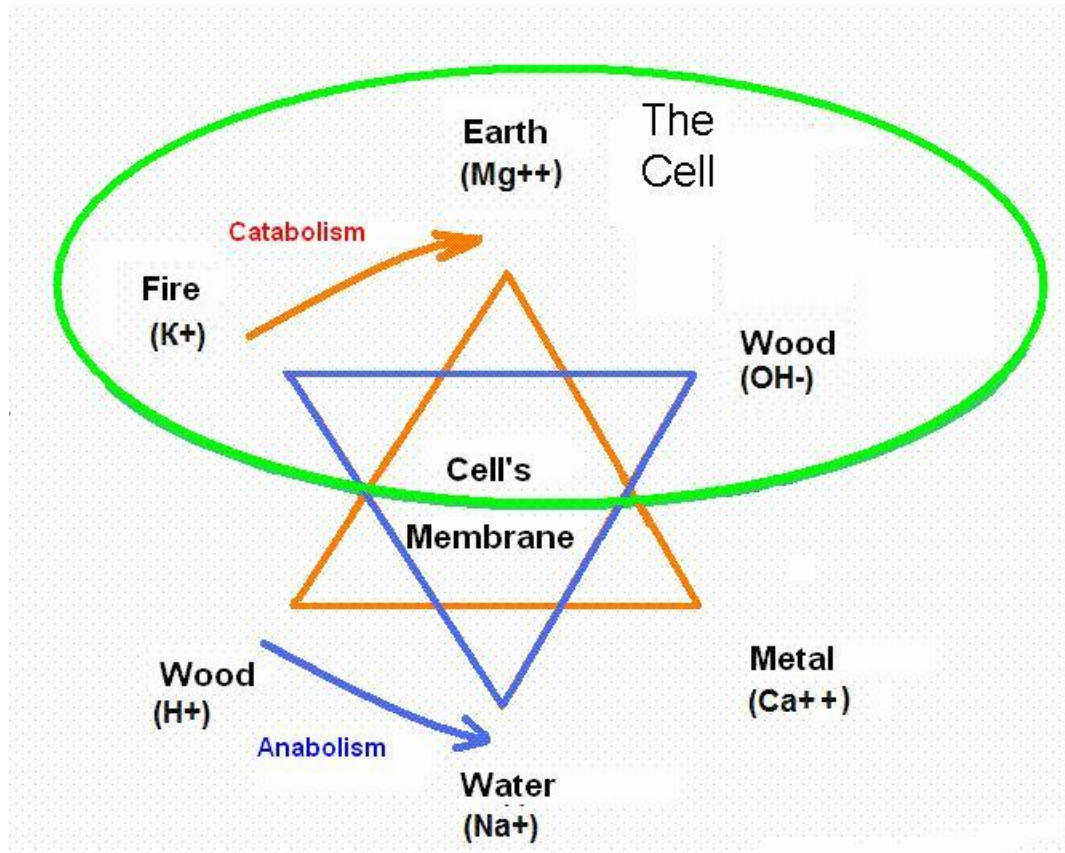
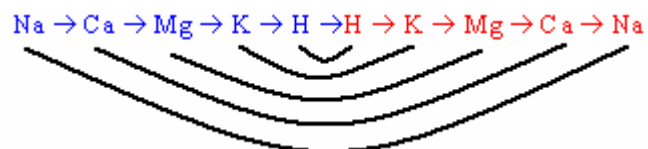


Fig. 7

- Anabolic and catabolic processes have mirror-like structure of ions flow:



- There are 3 kind of main ionic pumps:
 H^+ & OH^-
 K^+ & Na^+
 Mg^{++} & Ca^{++}

- Factors of Samohotsky are divided into 2 groups from point of view of anabolism/catabolism. **J. F. McClendon**, in his work "On the hydrogen ion concentration of sea water and physiological effect of the ions of sea water" (Department of Physiology university of Minnesota, and Tortugas laboratory, Carnegie Institution of Washington, November 10, 1916) described peculiarities of ions at alkaline environment (the blood is alkaline – pH is about 7.4):

H⁺, Mg⁺⁺, Ca⁺⁺ – decrease penetration factor of cell for alimentary substrates and it means acceleration of catabolic processes in cells;
OH⁻, K⁺, Na⁺ – increase penetration factor of cell for alimentary substrates and it means acceleration of anabolic processes in cells.

7. Applicability of the hypothesis of Samohotsky's factors to readings of the pulse Metabolic Analysis (PMA).

In the software of PMA readings of factor's concentration are Fullness parameters of an appropriate functional systems (they are correlate with names of acupuncture channels)

Heat parameter indicates active utilization of ions in metabolic processes. In this case we should take into account combination of factors as follow:

- If there are low Fullness (low concentration of ions) and high positive level of Heat (the process of active usage of ions) – the depletion of an appropriate functional system is possible and it will be difficult to restore normal concentration in the whole body.

- If there are low Fullness and zero reading of Heat parameter, we should know, the functional system is damaged yet.

To select the way of correction of ion concentration the law of Wu-Xing should be used, or simply use readings of Summary table to increase concentration of ions for functional system with the greatest damage.