

Channel Theory

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Chinese doctors have used acupuncture to treat different kinds of diseases for approximately 2,500 years. According to their knowledge and clinical experience, they put forward the "channel theory" to explain the mechanisms of acupuncture.

During the Warring States period (475-221 BC), the *Huang Di Nei Jing (The Yellow Emperor's Classic of Medicine)* laid the theoretical foundations of traditional Chinese medicine (TCM), and is considered one of the greatest medical classics in China (Yanchi, 1988). It consists of two books: *Plain Questions (Su Wen)*, which deals with human anatomy, physiology and etiology of disease, and provides a holistic view of the relationship between man and nature; and *The Miraculous Pivot (Ling Shu)*, also known as the *Classic of Acupuncture*, which contains extensive discussions and theories relating to acupuncture, moxibustion, meridians, location of points, and manipulative techniques (Maoshing, 1995).

Chapter 10 of the *Ling Shu* says, "One can determine the survival or death of the patient, can treat various diseases, and find out whether the disease is sthenic or asthenic according to the condition of the channel, and one must understand it" (Wu and Wu, 1999). Acupuncture was described as a means of dredging the channels, adjusting the *qi* and blood, and promoting the circulation of the blood and the coming and going of energy, which are complementary with each other (Wu, et al., 1999).

The *Huang Di Nei Jing* was believed to be compiled by many practitioners who collected and systemized various medical works between the fifth and third centuries, BC. This was continuously studied and added to by others in later generations (Cheng, Li and Wong, 2001).

Since clinical reports have shown that acupuncture can treat many diseases, many scientists have tried to discover the mechanisms of acupuncture. There have been extensive efforts in recent decades to correlate the principles of TCM with Western medical science. Within this essay, the most encouraging bridge between these two paradigms has been in the field of electromagnetism. The aim of this essay is to compare and discuss the channel system, focusing on the mechanisms of acupuncture as laid down by the *Huang Di Nei Jing* with the modern science of electromagnetism.

Discussion

Chapter 58 of the *Su Wen* states, "A man has 365 acupoints which correspond with the day number of a year" (Wu, et al., 1999). These points were mapped to 14 channels (six yang and six ying meridians), one for each of the 12 *zang-fu* organs, along with a du channel and a ren channel. Acupuncture restores the proper flow and balance of *qi* to the imbalanced areas, allowing the body to heal itself and return to homeostasis.

All forms of *qi*, matter and their processes can be represented by yin and yang. Chapter six of the *Su Wen* states, "Heaven and the sun are considered Yang, and earth and the moon are considered Yin" ... "The reaches of heaven and earth and Yin and Yang are vast, and ultimately everything in the universe can be classified into the polarity of Yin and Yang" (Maoshing, 1995).

According to Chinese medical philosophy, a "vital energy" (*qi*) exists in the human body to activate and maintain the processes of life. This *qi*, which is derived from the environment through processes such as nutrition and respiration, is converted into an absorbable form by the *zang-fu* organs, and is stored for distribution throughout the body via the channel system.

The importance of the channel system is fundamental to TCM. The channel system is the pathway that forms the network of connections for the body to function normally. Nutrients essential to the tissues are distributed throughout the body via the channel system, as is the exogenous or endogenous pathogens. As chapter 62 of the *Su Wen* states:

"The communication between the five viscera depends on the channel tunnel which enables the circulation of the energy and blood. If the energy and blood are not in harmony, various diseases will occur. Thus, the channel tunnel must be unimpeded" (Wu, et al., 1999).

Polarity is another theory in the energetic systems of the human body in relation to acupuncture. Electrical potentials, which reveal polarity, were measured in the human body by Lonescu-Tirgoviste and Purna (1999), using electroacupuncturegram (EAG) equipment. In their study, the researchers observed that the distal acupoints could be positive or negative in relation to the ground. In this way, yin and yang symbolize the representation of polarity; that is, the relationship of opposites that are interrelated in nature.

Chapter 17 of the *Ling Shu* states, "The Yin channel is interlinked with the five solid organs and the Yang channel is interlinked with the six hollow organs. The Yang channel inherits the channel energy of the four extremities, and the Yin energy inherits the channel energy from the viscera. The Yin and Yang channel energies pour into each other like a ring, terminate and start again without end."

"When one knows the way of twisting the needle to purge the coming sthenic energy and to invigorate the going asthenic energy, the channel energies can be harmonized; thus, the clue of harmonizing the channel energy is in the understanding of the law of Yin and Yang" (Wu, et al., 1999).

The scientist Lakhovsky published important discoveries in the field of bioelectromagnetic therapy (BEM) and wrote *The Secret of Life* in the 1920s. He explained many interactions between living things and high-frequency electromagnetic fields. He concluded that living things could not only emit but also receive electromagnetic radiation, and that health could be equated to the oscillatory equilibrium of living fields. The radiatory energies of living cells make direct energetic communication between life forms possible. More recently, Reba Goodman (cited in Milbone, 1995) found that very weak low-frequency fields could also affect cells at the DNA level by altering the proteins produced from a cell's DNA.

Further research by Becker (cited in Gerber, 2000) found that the direct-current (DC) electrical control system tended to transmit information by slowly varying the electrical charge or voltage of the membranes of glial cells. He noted that this slow voltage change in the glial cells could be influenced by the application of external energy fields, especially magnetic fields. The current of injury and different types of magnetic and electromagnetic fields might possibly provide confusing electromagnetic messages to the body's DC electrical control system. Becker suggested that the meridians were electrical conductors that carried an injury message to the brain, which responded by sending back the appropriate level of direct current to stimulate healing in the troubled area. He also indicated that the meridians were conduction currents, and its polarity matched the input side of the two-way system (Becker and Seldon, 1985).

An analogy of this would be that of electricity traveling through a wire, and the resultant electromagnetic field it produces. The human electromagnetic field (HEF) presumably exists as an oscillating invisible energy field correlating with both health and disease in the body. This magnetic force is able to attract metals like iron and steel, and can also affect the movement of electrically charged particles like electrons (i.e., electricity), creating an electrical current in the wire (Gerber, 2000). In this case, does the wire represent the meridian? In addition, does the acupuncture needle represent the switch that regulates the electrical charge along the wire? This theory of electricity or *qi* runs parallel to that of chapter 25 of the *Su Wen*:

"The coming and going of the energy is invisible and is quite difficult to trace. Before the channel-energy arrives, the physician should wait patiently like waiting for a prey; when the channel-energy arrives, he should prick as pulling the trigger" (Wu, et al., 1999).

Nordenstrom (1989) demonstrated that acupuncture needling releases electrical energy into the body. The increased effect in acupuncture caused by twirling an inserted needle can simply be looked upon as corresponding to increased flow of charge.

According to recent research, Xing and Li (1998) studied the effects of different acupuncture manipulations on the electrical activity of the stomach in humans. The experiment proved that both the twisting-twirling and the uniform reinforcing-reducing methods inhibited electrical activity of the stomach to reduce the frequency of electrogastrogram (EGG; $P < 0.05$) and that the uniform reinforcing-reducing method decreased the amplitude ($P < 0.001$). Both the lifting-thrusting method and the manipulation-for-needling sensation propagating along channels excited the electrical activity of the stomach to raise the amplitude of EGG ($P < 0.01$), and the lifting-thrusting method increased the frequency ($P < 0.001$).

Much of the earlier research into the electrical nature of acupuncture points dealt with the differences in skin resistance between acupoints and the surrounding tissues. Nakatani (cited in Peng, et al., 2001) proposed that different areas of the body can have abnormally higher or lower conductivity, and that such abnormal conduction is very closely related to meridian lines. Further research showed that acupuncture points had a particularly strong transmitting power.

Deng (1999) states that when the body is stimulated by electroacupuncture, with a current of a definite waveform and ever-changing frequency, ions in the tissues will move in the direction leading to depolarization of the cell membrane and a change in concentration and distribution, resulting in functional changes in the body. Vitality and health show their presence with an abundant bioelectrical potential and the harmony of all functions. That is to say, good health depends more on the distribution and harmonious diffusion of these "currents" than is generally believed.

Milburn (1995) states that meridians and acupoints are recognized as having a capacity to exert control over various emotional and physiological processes. Specific influences on the acupoints, through needling, pressure or heat, are transmitted through meridians to cause the zang-fu to return to homeostasis. In addition, patterned cyclical fluctuations in the natural activity of the acupoints are described as a direct consequence of macroscopic (outside the organism) influences. This theory of external fluctuations in nature affecting the activity of acupoints was described in chapter 25 of the *Su Wen*:

"All methods of acupuncture must be in accordance with the movements of the four seasons, the sun, moon and stars. When the moon wanes, his channels and collaterals become asthenic, his *Wei Qi* is gone. During the winter one should acupuncture less. When the weather warms, one can apply more acupuncture. It is said that if one sedates during the new moon, one will weaken the

organs. If one tonifies during full moon, one causes the blood and *Qi* to overflow. Therefore, one should ascertain the location of the energy according to the moving sequence of the season and the abundant or declining status of blood and energy of a man, and wait for the optimum opportunity for treating" (Maoshing, 1995).

The effect of seasonal influences like cold and heat on human health is the general macroscopic influence, while the ability to calculate times when specific acupuncture points are most active or sensitive to treatment is the microscopic aspect. Blockages in the normal flow of these currents lead to high concentrations of positive or negative electrical charges that may cause pain and other symptoms of disease.

Conclusion

From the view of BEM, we can consider the human being as a dynamic energetic system that is correlated and held together by the laws of action, reaction, alternation of polarity, and symmetry, all of which are identical to those of the *Huang Di Nei Jing*. The *Huang Di Nei Jing* followed these same set of universal physical and biological laws that still apply today.

The macroscopic system, defined as the universe and time, represents the relationship between energy (electromagnetic), matter and movement (passage). All transitions from one state to another in any system constitute mechanical movement and reaction, i.e., from health to disease. The coherence of these components, electromagnetic, matter and transition leads to a highly organized energetic framework that passes through a continuous variation of its own self - the interplay of yin and yang. It is a dynamic interplay of the macroscopic and microscopic aspects of all nature, striving to equilibrium, a homeostatic relation that can only ever be transient like the changing of the four seasons.

This research, however, does not show exactly what the channel is, nor does it show the mechanisms of acupuncture. Therefore, further research is needed to discover these complex and elusive mechanisms.