

CROSSROADS: WHERE MEDICINE AND THE HUMANITIES MEET

History of Medicine in China

When Medicine Took an Alternative Path

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INTRODUCTION

Chinese legend has it that in the dawn of human civilization, Heaven sent sage-kings to the midst of men, teaching them how to survive in the hostile world. The beginning of medicine was associated with one or another of these sage-kings. Shen Nong, for example, learned the properties of each plant by tasting them, thus discovering the use of herbs as drugs. Since then, medicine flourished.

The development of medicine took a different path in China as it did elsewhere in the world. It devised a system in which circulation of qi is paramount, and changes of yin yang dictate the health of the individual (6). It was not until the 18th century that Chinese gradually adopted modern medicine. While it is not within the scope of this paper to examine the reasons for these changes, it intends to summarize the involvement of medicine throughout Chinese history.

THE BEGINNING OF MEDICINE

It is impossible to decipher when medicine started taking shape, but ancient myths seem to trace its beginning to the Stone Age when Chinese converted from hunter-gatherers to farmers. By then, they had accumulated enough knowledge to use nature to their advantage. Shen Nong's story of "tasting herbs", for example, reflected how "man gradually learned to recognize the properties of plants" after innumerable experimentation (4).

The first archeological evidence comes from the time of Shang during the Bronze Age (16th - 11th century BC). In Shang era ruins, scholars found particles of seeds still used extensively in Chinese medicine and stone-crafted instruments resembling surgical tools (4). They also found the first medical records on oracle bones, used by

shamans to communicate with the spiritual world [Felt]. It was a time when man believed that the dead influenced the living, and the supernatural world controlled harvests, wars, and illnesses. Shamans offered prayers to the ancestors and God to gain their favor. Some rudimentary medications, in the forms of soup or wine, as well as primitive surgeries with stone needles and knives supplemented what propitiation could not do (6).

Recorded Chinese history started around 722 BC during the Zhou dynasty (11th century - 256 BC). Medicine started to break away from religion and evolve into an independent field. Official archives from that period recorded medicine as a profession apart from diviners, even dividing it into four kinds: physicians, surgeons, dietitians, and veterinarians (2).

This was one of the most dynamic periods in Chinese history (771 - 221 BC). Numerous schools of philosophies, including the most prominent Confucianism, Moism, Daoism, and Legalism, drew on ancient concepts to convey their ideas about nature, human society and political system. Words such as dao, qi, yin yang, and wu xin took on new meanings and formed the basis of philosophical thinking. This trend inevitably affected medicine, as the same terms also found their way into medical theories.

Qi, for example, which meant air or breath, came to denote energy vital for human life. Yin and yang, which originally described different exposures to sunlight, became opposite forces whose equilibrium in human body was vital for good health. Wu xin (five elements) became properties assigned to five solid organs (wu zang); liver was associated with wood, heart with fire, spleen with earth, lungs with metal and kidneys with water (12). These terms illustrated the belief that each part in the human body was intricately related to and affected by one another. At the same time,

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indiscriminative usage of such concepts for both human physiology and natural sciences underlined an ancient Chinese belief that human and the universe were connected in mysterious ways (6).

People had gained some elementary understanding about human anatomy, and assigned physiological functions to these structures. Liver controlled blood composition; heart controlled blood circulation and thinking; spleen controlled digestion; lungs controlled breathing; kidneys control water balance and sperm production. Hollow organs such as stomach, gallbladder, intestines, bladder as well as an imaginary "triple burner" or *san jiao* were grouped into *liu fu*, primarily responsible for digestion, delivering nutrient or transmitting waste. There was also documentation of brain, pericardium, uterus and their respective functions [*Nei Jing*].

The meridian or *jing luo* system was formed during this period as well. The concept of meridians in the beginning referred to blood vessels but by 2nd century BC, it had separated from "blood pulse" or *xie mai*, indicating imaginary channels that transmitted *qi* and connected the organs [Jia 1979]. It was believed that *qi* and blood were transformed from nutrients (by the spleen) and air (by the lungs), then circulate in *jing luo xie mai* around the body as dictated by the heart [*Nei Jing*]. Acupuncture points were identified and placed along these meridians.

Diagnosis relied on four standard steps - inspection, listening, questioning, and palpation of pulses [*Nei Jing*]. Among these, the art of pulse palpation would later on become much refined, requiring the physician to distinguish between twenty-four different kinds of wrist pulses. When combined with a detailed history, inspection of general appearance, especially that of the eyes, the tongue and the hands, as well as listening of patients' voice, Chinese medical practitioners were expected to find the diseased meridian (13).

Methods of treatment at the time included simple surgical procedures, acupuncture, moxibustion, drugs, as well as acupressure, physical exercises, hydrotherapy, even simple psychotherapy that uses emotional adjustment to alleviate illnesses. Acupuncture as the core therapy, was quite refined by the end of 2nd century BC, involving nine different needles and many techniques. Although the role of herbal drugs was less significant, physicians had at their disposal at least 50 regiments for oral ingestion, and more than 90 for external application (6).

Physicians attributed causes of illness to seasons, weather, diet, human activities and emotions, all of which disturb the balance between *yin* and *yang*, thereby affecting the flow of *qi*. They put preventative medicine on the foremost position, stressing that diseases are better treated before their manifestation (7).

Texts dated from 2nd century BC warned against binge eating or drinking, spicy diet, overexertion, excessive emotions, and extremes of temperature. At the same time, physicians also realized the importance of hygiene. Governments constructed sewage systems in larger cities; people were advised to do regular house cleaning and avoid drinking contaminated water (6).

With the development of medicine, professional ethics also took shape. One text notes, "to make diagnosis without an adequate knowledge of *Yin* and *Yang*... is the first fault on the part of physician", "... to advertise one's medical skills falsely, to apply needles indiscriminately, to cause suffering to the patient unnecessarily, is to commit the second fault in treatment" (8).

Possibly during the 3rd century BC, medical professionals made a comprehensive review of the predominant theories and practices, by compiling the oldest Chinese medical text still in existence, *Huang Di Nei Jing* or "Yellow Emperor's Classic of Internal Medicine", which formed the basis of medicine for Chinese physicians in the coming ages (13). In the thousands of years that followed, Chinese medicine never deviated significantly from the basic framework created during this period.

THE DEVELOPMENT OF MEDICINE

The establishment of a unified Chinese empire in 206 BC marked the end of five centuries of warfare amongst Chinese states as well as the defeat of the Huns in the west. Chinese intellectuals were finally able to focus on collecting and collating writings from the past centuries, hoping to rediscover ancient wisdom that would serve them as guidance in every aspect of society and individual life. Many of ancient compositions were elevated to the level of reverence. *Huang Di Nei Jing* similarly gained this status and became the supreme authority in the medical community.

Although the framework laid out by *Huang Di Nei Jing* was unchallenged, medical practitioners sought to incorporate new experiences as they put old wisdom to practice. *Nan Jing* (Classic of Difficult Problems) of 1st century BC reflected this development, as it sought to clarify old concepts and perfect the classical theories by explaining and expanding on eight one passages selected from *Huang Di Nei Jing* (12). Compared to *Huang Di Nei Jing*, the descriptions and treatments of ailments were more detailed in this book, with most known entities characterized and named, then sorted into more than thirty different categories (6).

Due to its transmissible nature, one disease category, *Shang Han Re Bing*, which included mostly infectious diseases causing fever, was extensively studied, with their symptomatology, natural history and treatment

principles documented in *Shang Han Za Bing Lun* of the 2nd century AD. The value of this book, however, goes beyond the detailed description it devoted to infectious diseases. Rather than focusing on treating the symptoms, the book reflected an increasing emphasis on treatment variation "according to individual pathological case", as it stressed change of strategies according to the affected meridian (6). Both *Nan Jing* and *Shang Han Za Bing Lun* were soon canonized by the medical community alongside *Huang Di Nei Jing*, and became must-read for all physicians.

From *Huang Di Nei Jing* to *Nan Jing*, then to *Shang Han Za Bing Lun*, it illustrated a peculiar trend in the development of Chinese medicine - as people accumulated more knowledge and became increasingly refined at diagnosing diseases and finding more effective treatments, the development of medical theories stagnated. For centuries that followed, no one attempted to challenge the system of ying yan and wu xing.

Since then, almost every dynasty compiled textbooks that attempted to epitomize all known medical knowledge at the time, often efforts sponsored by the government. For example, *Zhu Bing Yuan Hou Lun* (Treatise on the Causes and Symptoms of Maladies) in 610 aimed at being a general medical textbook, detailing 1,800 symptoms and signs, discussing their etiology, natural history and complications; *Wai Tai Bi Yao* (Medical Secrets of An Official) in 752, on the other hand, reviewed diagnosis and treatment of diseases through discussion of 1,140 actual cases (13). During 11th to 14th century, the government also compiled several editions of medical encyclopedias as medical reference books.

Since the invention of woodblock printing in the 10th century, individual compilations on medical specialties also flourished. A number of works were written on internal medicine, orthopedics, pediatrics, obstetrics and gynecology, ophthalmology, dermatology etc., and the first forensic medicine textbook in the world was published in 1247. From these books it appeared that with time, medical practitioners showed more insight into diagnosis, etiology and treatment of infectious diseases such as typhoid, cholera, malaria, tuberculosis, and leprosy, as well as foreign ones such as syphilis and gonorrhoea. More subtle ailments such as diabetes also came into their attention. The pediatrics treatises provided advice on childhood nutrition and disease prevention, and showed much better understanding of "eruptive fevers such as smallpox, chickenpox and measles, in terms both of symptomatology and of therapy"; the obstetrics texts recognized the need for precaution with drugs during pregnancy and acquired a number of techniques to deal with dystocias (4). Although often ridden with errors and superstition,

these books recorded the progress of Chinese medicine and represented some of the most sophisticated medical knowledge at the time (6).

Acupuncture, often combined with moxibustion, remained one of the main treatment modalities in Chinese medicine. *Zhen Jiu Jia Yi Jing* (The ABCs of Acupuncture and Moxibustion) in 282 AD reviewed the existing knowledge and experience on the subject up to that time, and remained an important acupuncture textbook for centuries to come (6). On the other hand, the limit of its therapeutic effect was quickly recognized. Drugs thus became more prominent in treatment.

Shen Nong Ben Cao Jing of 1st century AD was the first materia medica compiled to meet the growing need for herbal medicine, recording 365 drugs of herbal, animal and mineral origin, classified by the degree of toxicity. "Superior" drugs (e.g. ginseng) are non-toxic and can be used in relatively large doses for their invigorating effect; "inferior" drugs (e.g. croton) are toxic and should be used with caution for their therapeutic values. The property of each drug was recorded in terms of their influence on qi to explain their effect with various types of diseases. The pharmacokinetic interactions were also recorded to help determine the right drug combination (6).

As more herbs were being discovered for their therapeutic effects, materia medica had to be revised with each passing age. *Xin Xiu Ben Cao* (Newly-revised Materia Medica) in 659, the first Chinese official pharmacopoeia, recorded 850 drugs; the official pharmacopoeias in the 10th and 11th century extended the number of drugs to 1,748, and included illustrations to help their recognition [Said 1965]. The most important work was compiled in 1579. *Ben Cao Gang Mu* (Compendium of Materia Medica), one of the most popular works on Chinese medicine, "expanded the content of the materia medica to 1,892 drugs, revised drug classifications, corrected errors in its predecessors and established guidelines for the preparations as well as the usage of drugs" (4).

As Chinese medicine rarely employed one drug alone in treatment, an increasingly number of work also appeared, teaching physicians time-honored formularies that had already been proven effective in treating illnesses. The most famous of these, *Qian Jin Fang* (Thousand Gold Remedies) of the 7th century collected 5,300 prescriptions that became an important reference for doctors in later centuries. Although they served as comprehensive reference for physicians, these works often "lacked judicious selection", containing treatment methods from drugs, acupuncture, moxibustion, dieting, to incantations and exorcism (13). With time, the sheer volume of these compilations also became

overwhelming. By the 11th century, government-published medical reference books contained as many as 20,000 prescriptions. With the multitude of therapies available, physicians became increasingly selective, retaining more effective prescriptions and acupuncture points, based on the treatment principles outlined by *Shang Han Za Bing Lun* (6).

The development of Chinese pharmacology was enhanced by Daoist practice of alchemy during 3rd to 7th century. While the consumption of alchemist products led to many cases of poisoning, this practice nevertheless promoted the development of pharmaceutical science, "paving the way to emergence of a chemical pharmacy". By 5th century, a work appeared "specifically devoted to the manufacture of medicines" from raw materials of mineral and herbal origin (4). Recipes for manufactured medicine often came from well-known regimens used for common symptoms, that were relatively cheap, safe and effective. Since they required no prescription and no tedious preparation, they quickly gained popularity among the masses (13). By the 10th century, government started setting up agencies to manufacture these over-the-counter drugs and opening public dispensaries, which helped to ease demand for health care in a booming population (6).

In contrast, certain treatment methods, especially surgery, received little attention from the medical community. Since the depiction of the first successful laparotomy in the 2nd century AD, no other attempt was made over the next few thousand years. Surgeons limited their role to treating skin ailments such as ulcers and boils, and physical injuries such as fractures and dislocations. This uneven development is often attributed to the reluctance or even taboo in traditional Chinese culture to disfigure the body (9). Accordingly, the development of anatomical knowledge also stagnated. Their depiction of human anatomy progressed little since *Huang Di Nei Jing*, and was once described as "as if someone saw the incomplete dissection of internal body and... filled out the remaining parts from imagination". It was not until the 19th century when surgeons attempted to remedy this deficiency, but their impact was limited at best (6).

Honoring *Huang Di Nei Jing's* emphasis on disease prevention, Chinese physicians also sought for ways to improve people's health through diet and exercise. In the 2nd century AD, a system of exercise known as "frolics of five animals" was developed from ancient physical and meditation exercises, and served as the inspiration of a multitude of systemic exercises that developed later on, the most famous being Yang-style Tai Ji quan (or Tai chi) (6). Preventative medicine also stressed the values of balanced eating, and over time

incorporated food into the system of ying yan and wu xing. By the 13th century, it had established an important role as preventative and adjunctive therapy, and dietitians taught adjustments in the selection of food, cooking and flavor according to physical health and seasons. Many of their advices are still being valued today (4).

Governments played a significant role in preventative medicine as it paid particular attention to public sanitation, constructing sewage systems in the cities, employing road-sweepers and night-soil collectors. As late as the 19th century, the Chinese capital was still described as "unrivaled among the cities of the world" in its drainage system (13). There were also records on construction of state hospitals and orphanages from 10th to 13th century.

Preventative medicine played an especially important role in the management of infectious epidemics. As early as the 3rd century AD, people had learned to use prophylactic drugs and quarantine of patients to control spread of epidemics. Later on, they also learned to disinfect by soaking patients' clothes in hot water to protect their family members (6). The most important development probably took place in the 16th century, as books described a popular practice in which small amount of pustules from smallpox patients were inoculated in the nostrils of healthy subjects for disease prevention. This crude method represented the first vaccination in the world, and was later introduced to Russia, Japan, Byzantine and several other countries (1).

The growth of knowledge was accompanied by a growth of awareness in professional ethics. In the first chapter of *Qian Jin Fang*, for example, the author stressed: "A great doctor... should have mercy on the sick and pledge himself to relieve suffering among all classes... He should look upon the misery of the patient as if it were his own and be anxious to relieve the distress, disregarding his own inconveniences..." (8) Similar emphasis on ethical practice of medicine was repeated in the medical compilations of every dynasty, primarily focusing on the principles of professionalism and benevolence, which was reflected in veneration for life, respect for patients, and universality of care (14). Some textbooks also cited medical confidentiality as one of cardinal rules that physicians needed to follow. In the absence of particular rules and regulations, these qualities were mainly achieved through self-cultivation. As medicine developed, quality control of medical care became increasingly important. In 442, the first medical college was established. Until then, the only means to medical education had been dependent on the system of apprenticeship. The new system sought to standardize the quality of physicians who served the emperor. The students were required to specialize in one of four

areas: internal medicine, surgery, pediatrics, or otorhinolaryngology-ophthalmology-dentistry. At the end of their training, qualification exams were held to grade their performance (6). In the 11th century, government broadened the scale of medical school and established regular schools in many parts of the country. Through a system of competitive examinations, physicians were selected for positions in government administration and medical education (13).

By late 17th century, however, Chinese medicine entered a period of "relative decline". As the regimes encouraged return to classic scriptures and disapproved of new ideas, the Imperial Medical College "degenerated to reciting classics in the library", and the medical community at large paid little attention to new theories and new discoveries (6). Public health system was chaotic - no standardized examination was in place for quality control, some medical practitioners never received a formal education, and regular practitioners "have to compete with the herbalists, street dentists, medicine vendors, barber surgeons ... who strive with on another in preying on the ignorance and credulity of the masses". Consequently, people viewed the medical profession with suspicion, and often would rather resort to superstitious practices such as incantation and exorcism for treatment (13). Public sanitation also worsened drastically. Overcrowding, floods, drought, famine, local bandits and rebellions led to significant deterioration in the general standard of living (3).

It was then foreign, especially European influences started to prevail in China. Chinese came to know a branch of medicine unlike any other they had contacted before. It was known as western medicine.

WHEN THE EAST MEETS THE WEST

By that time, the Renaissance and the Reformation had transformed Europe and medicine was starting to benefit from modern sciences. European interaction with the rest of the world expanded. The first westerners to reach China were the Christian missionaries.

During the 17th and 18th century, several Jesuit missionaries enjoyed considerable prestige in the Chinese imperial court. The herbal medicines they brought from Europe, such as such as quinquina, were readily incorporated into Chinese pharmacology (4). In 1805, Jennerian anti-smallpox vaccination was introduced to China, rapidly replacing the old practices due to superior safety and efficacy. Medical missionaries in the early 1800's also amazed the Chinese with their surgical skills, as surgery in China were still underdeveloped. The first missionary hospital was founded in 1834, the first western medical school opened in 1866 (3). Since then, the westerners opened

many centers for health care and physician training in major cities. Impressed by western medicine, many Chinese scholars also went abroad to study.

Yet as European explorers and merchants poured into this land, the initially peaceful interaction turned into a malicious conflict. The first Opium War in 1839 ended with Chinese defeat. As the Europeans, the Americans, and the Japanese asserted their power in China, the kingdom was rapidly reduced to a semi-colony. Pervasive disillusionment in the monarchy led to its downfall in 1911. The Nationalists led by Dr. Sun Zhong Shan (Sun Yat-sen), equipped with western political ideals, founded the first Chinese republic.

The public health problem at the time was staggering. Early industrialization in the major cities was creating new health problems in addition to increasingly rural impoverishment. Epidemics of malaria, cholera, trachoma, dysentery, typhoid, smallpox etc. broke out with increasingly short intervals. [Hillier 1983] Having resisted developments in their own community as well as the scientific discoveries from the west, the traditional medical community was ill equipped to deal with these diseases. In contrast, having gone through the revolution by "germ theory" in the mid-1800's, western medicine proved much more valuable. In 1911, a British-trained doctor successfully directed the operation to control the epidemic of pneumonic plague in Manchuria, giving a "great fillip to scientific medical practice throughout China" (6).

With help from foreign trained medical graduates, the Nationalist government took initiatives to improve public health, especially in large urban centers. It coordinated mass health campaign in Fu Zhou in 1920, started midwifery training in basic hygiene in 1929, and launched New Life Movement to abolish drugs and prostitution in 1934. But their efforts were undermined by ongoing wars, government corruption, as well as the reluctance of "western-style" doctors to go to rural areas where medical services were most needed (3).

The policy-makers also hoped that by adopting modern scientific medicine, the traditional practice would be replaced. In 1929, a series of measures was approved to suppress the practice of traditional medicine, including prohibiting traditional physicians "from opening medical schools or hospitals". But the shortage of modern doctors limited the practicality of these policies. Moreover, the use of traditional medicine "produced satisfactory enough results in the treatment of illness, particularly in those which modern sciences apparently could not cure". Compared to imported drugs, herbal medications were "cheap, widely available and easy to use, with few adverse effects". The attempt to eliminate traditional medicine failed due to fierce public opposition (4).

In 1949, the communists replaced the Nationalist regime. Like their predecessors, they saw the pressing need to improve public health. New educational programs trained thousands of health care workers; national health campaigns improved public sanitation; vaccination programs eliminated epidemics in the cities and reduced their incidence in the countryside (4). Seeing the value in the traditional practice, the government employed traditional doctors, thereby incorporating them into the health system. As herbs and acupuncture spared the need for imported drugs, the cost of public health was reduced and its availability increased, bringing health care to many underserved areas in the country. Currently traditional practice still delivers "almost 40% of total health-care services" in China (10).

At the same time, the government revolutionized the practice of traditional medicine. They founded colleges and hospitals for traditional practice, standardized the education system, incorporating modern sciences into their curriculum. During the Maoist era, the government tried to combine traditional and modern medicine into a new, improved discipline; however, its lack of understanding in either branch of medicine predicted its failure. Today, the government allows both disciplines to develop independently (10).

Traditional physicians, especially those who studied modern sciences, are encouraged to engage in research, such as investigation of active ingredients in herbal medicine, neurophysiology of acupuncture etc. They are also invited to modify the old theories based on new scientific knowledge (3). The result of this "modernization" remains to be seen.

Most doctors trained in modern medicine, on the other hand, admit that "there is something in traditional medicine", despite retaining some skepticism. Many of them even use traditional medicine for some of their own illnesses (e.g. common cold, athlete's foot etc.). Traditional medicine's hold on Chinese, it seems, is still strong (10).

CONCLUSION

In China, the development of medicine took an entirely different route compared to the West. Instead of looking to science for inspirations, it endorsed ancient philosophies, creating a medicine based on concepts of qi and yin yang, and practices of acupuncture and herbal drugs. During its three thousand years of history, it pioneered in such things as vaccination, diet, exercise

and medical education, and had influenced medical practice throughout Asia. Its principles of holistic approach to illnesses, emphasis on uniqueness of individual cases, interactions between organs, disease prevention with diet and exercises, and awareness of environmental influences prove valuable even today.

In a world revolutionized by science and technology, China inevitably adopts modern evidence-based medicine. On the other hand, unwilling to give up traditional wisdom, Chinese endorses a health system that intends to incorporate the best of both worlds. Will Chinese medicine become marginalized and diminish? Or will it adapt itself to the world of science? The outcome of this thousand year-old practice remains to be seen.

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