Historical and Cross-Cultural Perspectives on the Art of Medical Diagnosis

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The practice of medicine has been integral to human civilization since the beginning of recorded time. The innate tendency toward survival has led humans to search for substances and methods with which to sustain health and prolong life for centuries. The direction of medical advancement often reflects the values and beliefs of the culture in which that medical system originates, and this trend can be seen in the developments of Western and Eastern medicine. The two perspectives on health and medicine exhibited similar characteristics until the 19th century in America. Historically, both attributed the cause of illness to internal imbalance, until Western medicine experienced a radical shift in the mid-1800's. Cultural patterns of American society catalyzed this change, while Eastern cultural beliefs resisted such a transformation; these factors thus influenced the development of the modern Eastern and Western approaches to medical diagnosis and treatment practiced today.

The Western Medical Tradition

Modern Western medicine in America is based on scientific ideals of analysis and empirical testing. Diagnosis and treatment methods have been based on results of repeated and extensive laboratory and clinical testing and consequent verification by the scientific method. Society in America, especially with the impact of the Industrial Revolution and applied science beginning in the late 18th century, has integrated the principles of science into most aspects of daily life, and its subsequent influence on modern medicine in America has been equally pervasive.[1]

Western medicine today, although recently being reconsidered, regards the mind and body as separate functioning systems, and treatment often follows with similar regard to their functionality. The modern view of physical health has been strongly influenced

by scientific theories of the 19th and 20th centuries, such as the Cell Theory (1838) and the Germ Theory (1870's), which view the state and maintenance of health on a cellular level. The Cell Theory of Matthias Schleiden and Theodore Schwann states that cells, or the smallest units of life, constitute all living organisms; the Germ Theory, which is attributed to the work of Louis Pasteur and Robert Koch, explains the cause of disease in terms of external microorganisms, which invade and disrupt the normal functions of these cells.[2] Specific areas of modern medicine, such as microbiology, virology, and immunology, have developed as a result of the widespread acceptance and application of these theories in modern medical practice.[3]

The importance of rational thought to the medicine practiced in America and the present-day Western world can be traced back to the time period of the ancient Greeks. The Greek people tremendously impacted the development of human civilization through the emphasis they placed upon philosophy and the extension of the human mind. That influence can also be seen on the development of the medical world.

Prior to the Greek philosophers, health in other cultures was mostly attributed to the influence of supernatural, mystical, and/or religious forces. A group of philosophers referred to as the Presocratic philosophers focused explanations of health and natural phenomena upon the natural world, thus taking an important step toward a more rational approach to health.[4] Thales of the Greek city Miletus is considered the first among the Presocratics; although his writings are not available today, historians believe he wrote on the necessity of water to the existence of the earth. A student of Thales, Anaximander of Miletus, developed a theory relating the importance of balance to human beings and their natural world. The idea of balance would become integral to Greek medicine and the

Greek perspective of health. Anaximenes, another Presocratic from Miletus, wrote on natural properties, such as the opposing nature of heat and cold, and Empedocles believed that the world was composed of four main elements: earth, fire, air, and water. Anaximander and Empedocles also believed that a sort of evolutionary process was involved in the natural world.[5] While each philosopher contributed with individual theories, their contribution to medicine occurred collectively; Greek physicians were influenced to seek more rational and/or natural explanations for illness, rather than to attribute the state of health to supernatural occurrences.

Around the same time period (approximately 500 B.C.), a Greek physician in Croton named Alcmaeon made a notable contribution to Greek medicine.[6] Alcmaeon applied the idea of balance specifically to the human body and believed that illness resulted from a lack of equilibrium within the components of the body.[7] This understanding of illness would permeate the Western medical world well into the 19th century.

Hippocrates is credited with the next significant step in the development of Greek and later Western medicine. While little is known about his actual life, his reputation as a renowned physician and author of the Hippocratic Oath has persisted into modern times.[8] Historically, Hippocrates was considered to have been a member of the Asclepiad physicians, who traced their beginnings to the god of healing, Asclepius; this connection is likely incorrect because Asclepius was deified in the same century in which Hippocrates supposedly lived (5th century B.C.).[9]

One of Hippocrates' greatest contributions to modern medicine rested in his precedent of regarding medicine as a field separate from religion and philosophy.

"Hippocrates confined the medical man to medicine".[10] After Hippocrates, the physician, in the Presocratic tradition, recognized physical problems with the body and sought explanations in natural terms, without relying upon supernatural answers based in philosophic thought. The Hippocratic Oath detailed the duties of a physician and the ethics by which a physician should conduct his practice.[11] The oath is symbolically recognized in the medical world today, but the actual authorship of Hippocrates is questionable. For example, the oath prohibits abortion and suicide as acceptable practices of a physician. In Greek and Roman times, however, both abortion and suicide were not considered illegal or ethically inappropriate measures. The oath is more consistent with the beliefs of a philosophic group known as the Pythagoreans, but nonetheless the oath remains attributed to Hippocrates today.[12]

Likewise, the "Hippocratic Corpus" is a collection of approximately 60-70 essays, which cover a variety of medical topics.[13] The contradictions evident among the essays discourage the idea of a single author. No direct evidence clearly links Hippocrates to the writings, and current historical opinion considers the Corpus to have been authored by multiple physicians of a similar time period as Hippocrates.[14] Thus, Hippocrates most likely was not responsible for the oath and books which bear his name today. He does, however, represent the beginning of a medical tradition in the Western world.

A specific theory, whether developed or only practiced by Hippocrates, is crucial to understanding the direction of Western medicine through the Renaissance into modern times: the theory of the four humors. The books in the "Hippocratic Corpus" describe the composition and functioning of the human body as the result of four main humors: phlegm, blood, yellow bile, and black bile.[15] Like the four natural elements of

Empedocles, the four humors of the body exhibited combinations of four qualities: hot, cold, dry, and wet. For example, the humor yellow bile was associated with the element of fire, and both were considered to be dry and hot in nature. Black bile, however, was congruent to the earth, and their qualities were dry and cold. The humoral theory was based upon the idea that a balance existed among these humors, and a healthy person exhibited appropriate proportions and distribution of their humors. Illness, then, occurred with the disruption of the natural humoral balance.[16] For example, fever occurred with an accumulation of excess yellow bile, while epilepsy was believed to be the result of too much phlegm in a certain area of the body.[17] Treatment for illness was concentrated upon a restoration of balance, mostly achieved by removing the excess humor from the affected area.[18]

In the 2nd century A.D., Galen became the next notable figure within the development of Western medicine.[19] Medicine in the Western hemisphere, as it appeared in the Renaissance and early modern times, was largely impacted by Galen's interest and writings on the Hippocratic Corpus.[20] Galen accumulated his knowledge in the medical field from training in the areas of biology, medicine, and philosophy, as well as his experience as a surgeon to gladiators. These experiences likely inspired his studies in dissection and anatomy.[21] Galen followed the humoral theory of Hippocrates but also produced many works on anatomical and physiological functions, based on his own studies.[22] Most of the processes he described, however, were incorrect. He mistakenly formulated explanations of human physiology based on animal specimens but also misunderstood organs with similar functioning. For example, he believed that the circulations of arteries and veins were isolated from each other.[23] While Galen

contributed to the future of medicine in his scientific and anatomical approach to health, his incorrect interpretations of physiology significantly stunted progress in the development of the current medical field.[24]

The humoral theory of the body largely constituted medical thought and practice throughout the Renaissance into the 18th and early 19th centuries in America. A major influence in the continued belief in this doctrine arose in the work of Dr. Benjamin Rush in Philadelphia during the 18th century. Dr. Rush believed that disproportionate activity of blood vessels resulted in fever and ultimately illness. He advocated treatments to remove the effects of this excessive activity, as humoral treatments similarly corrected imbalance among the humors.[25] The treatment, referred to as monistic depletion therapy, included physically harsh methods of bleeding, purging, vomiting, and/or sweating the patient in order to restore the blood vessels to their original state.[26] The first step of treatment usually involved bleeding, which could be achieved by single or multiple cuts into a vein or by applying a cup over an incision in order to create a vacuum. The lowered pressure would then draw blood to the affected area. A substance consisting of mercuric chloride (Calomel) was also used in order to induce vomiting. Due to the violent nature of these treatments, this medical practice is referred to as the heroic medicine of this time period.[27]

While heroic medicine permeated a significant portion of 18th and early 19th century American medicine (along with "quackery" movements using water and electricity, among other methods), the 19th century proved to be a turning point in medical belief, and 20th century medical practice would see the benefits of this revolutionary change in perspective. The development of the microscope (beginning with

a Dutch clockmaker named Anton Van Leeuwenhoek and then Robert Hooke in 1665) proved integral to the development of modern Western medicine because the microscope permitted the exploration of life on a level previously forbidden to human study.[28] Also, the work of foreign physicians and scientists influenced the development of medicine in America during two notable time periods: the influence of French physicians between 1820 and 1860 and that of Germany from 1860 until the end of the 19th century.[29] During the forty-year time period of French influence, approximately 700 physicians from the United States visited medical facilities in France.[30] During that time, French physicians were conducting the first comprehensive clinical studies within their hospitals and were utilizing stethoscopes and other instruments for physical examinations.[31] The physicians returning to the US brought with them skepticism for the current heroic practice of medicine, but the medical community was slow to receive their observations.[32]

Physicians trained in Germany during the 2nd half of the 19th century introduced the importance of the scientific laboratory to medicine in America.[33] Laboratory study and research permitted the work of Pasteur, Koch, and Lister, among many others, whose findings initiated the theories which would shape and develop the fields of modern Western medicine. Prior to these men, a theory about microorganisms had been formulated in the 16th century by Fracastorius, and his work was later supported by Kircher, Lancisi, and Linne in the following two centuries. Casimir Davaine and Pierre Rayer discovered and conducted research on the anthrax bacillus in 1850, becoming the first to attribute pathogenic characteristics to a microorganism. The work of Louis Pasteur, however, verified what had previously only been suspected. Beginning in the mid-19th century, Pasteur began studying the process of fermentation. Previously,

fermentation was considered to be a strictly chemical occurrence, but his research conclusively determined that microorganisms, in fact, were responsible for the event.[34]

The development of the field of bacteriology (modern-day microbiology) is credited to the work of both Louis Pasteur and Robert Koch. These men were contemporaries of each other, working separately, but ultimately reaching the same conclusion, which in modern science and medicine is known as the Germ Theory. Koch also studied the anthrax bacillus and contributed to the theory in his belief in the necessity of laboratory study on microorganisms (upon their identification).[35] Between 1878 and 1887, a significant amount of research was conducted within the field of bacteriology, providing the empirical basis for the scientific method of medical treatment today.[36]

Laboratory science was widely seen as a critical component of American medical research and advancement by the beginning of the 20th century. The changes in medical education at this time reinforced the importance of laboratories and clinical facilities. Medical schools of the 18th and 19th centuries in the United States trained physicians primarily through apprenticeship; systematic standards were virtually non-existent at this time, a fact which contributed to the lack of continuity within medical belief and practice.[37] In 1893, the Johns Hopkins medical school opened in Baltimore; its founders had studied under German scientists and were integral in introducing laboratory science to American universities.[38]

20th century trends in American medicine have reflected the integration of laboratory and clinical science into the field. X-rays, discovered by Wilhelm Roentgen in 1895, have become a vital resource for medical diagnosis today.[39] The identification of

pathogens and microorganisms led to a variety of vaccines, such as diphtheria, tuberculosis, tetanus, and polio. Research into the dietary needs of the body resulted in the discovery of critical nutrients, such as vitamin A (1913) and vitamin B (1916), as well as an increased understanding of their role in body functioning. The benefits of penicillin, first recognized by Sir Alexander Fleming in 1929, initiated a vast interest in the development and application of antibiotics in the 20th century.[40] With the knowledge and technology available today, modern medical treatment has become an invasive one, with the use of external means in order to manipulate the internal environment.[41] The success of these methods has placed Western (specifically American) medicine in the forefront of trauma and illness care.[42] The future of Western medicine is being concentrated on the mechanisms by which disease processes occur. Many pathogens have been identified, and the anatomy and physiology of a normal body are fairly well understood; knowledge of these mechanisms will enable scientists and physicians to intervene at the step where normal functioning ceases to occur, thereby preventing the continued development of an abnormal condition.[43]

The Eastern Medical Tradition

The modern Eastern perspective on health and medical treatment, specifically referred to as Traditional Chinese Medicine (TCM), is based in a significantly different medical tradition from Western medicine and has exhibited a more consistent development throughout its history. While Western medical practice of the past and present share few commonalities, the medicine of China today greatly resembles the basic theories and beliefs of ancient medicine. TCM is largely centered on the view of the body as its own ecosystem, meaning that the components of the body function

cooperatively, and that level of harmony and balance is essential to good health. The body as a whole must also maintain equilibrium with its external environment. These two aspects of balance are critical to the principles of Eastern medicine.[44]

While the major developments leading to modern Western medical practice occurred recently in the context of history, the foundations of Traditional Chinese Medicine originated almost 2,000 years ago. While certain practices such as acupuncture are believed to have existed prior to written history in China, historians attribute the Nei Ching Su Wen (also known as the Canon of Medicine) as the first written medical document within TCM.[45] Sources vary in their assessment of the book's date, but an appropriate estimation appears to be between the 5th and 3rd centuries B.C. Legendary authorship is given to the Yellow Emperor, Huang Ti, but the actual authorship is uncertain. Like Hippocrates and the Hippocratic Corpus, little factual information is known about Huang Ti, and the Nei Ching Su Wen more likely was compiled from the work of multiple individuals.[46] In addition to the historical contributions of this text, another notable work was produced within this time period (specifically the Warring States period from 475-221 B.C.): the Classic of Acupuncture and Moxibustion by Huang Fu Mi. Descriptions of the body's channels (connections between the main organs in TCM) and over three hundred acupuncture points were included in these works, establishing the foundations of current medical beliefs. The Warring States period also witnessed the rise of Taoist thought in China. George Lewith write that this philosophy, emphasizing "harmony between man and his world", would prove significant in the sustained belief within this traditional system of medicine.

The practice of acupuncture, use of herbs, and application of the basic theories behind these techniques continued virtually unchallenged for the next thousand years. In the 6th century A.D., the Imperial Medical College of China became the nation's first medical institution. The training of physicians and research into these medical fields were set forth as primary goals of the school. Moxibustion, or the burning of moxa (Artemisia vulgaris leaves) was a technique (still in practice today) utilized as a way to bring heat to a certain area of the body; its development paralleled that of acupuncture, using the same ideas of channels and acupuncture points and was included in the texts of the Warring States period. A third important medical text, the Illustrated Manual on the Points for Acupuncture and Moxibustion on the New Bronze Model, was produced by Wei-yi in 1026 A.D. Prior to this document, hand-copied medical books had created confusion on account of manual mistakes. Wei-yi compiled the information known to that time into a consistent, usable text. His work achieved another level of usefulness and credit within TCM when two human statues of bronze were erected, complete with an accurate scale of acupuncture points based on his writings. These statues were used in medical education until overuse made the points difficult to differentiate.[47]

During the Ming dynasty (A.D. 1368 – 1644), the techniques which had then become fairly common in medical care continued to flourish. The Materia Medica, an important text on the use of herbal remedies, was written by Li Shin-chen during this time, and other authors, including Kao Wu and Yang Chi-chou, contributed with works of their own. Also, this time period witnessed the influence of European cultures on the Eastern world. As Chinese and European ships traversed the waters of other countries, new ideas were initiated into these cultures. Initially, books of Western science were

banned from China, but internal conflict in the subsequent Ching dynasty (A.D. 1644 – 1911) later divided the nation's ideals. Chinese leaders began to view the Europeans as positive and progressive influences and soon sought to follow their example; in 1822 acupuncture was removed from the curriculum at the Imperial Medical College, and a century later, the practice of acupuncture was nationally abolished.[48]

By the middle of the 20th century, new leadership under the Communist party and Chairman Mao reinstated the importance of Traditional Chinese Medicine, in hopes of reviving the declining medical care of the nation.[49] Acupuncture and other traditional medical practices were reintroduced into the culture, and improvements have continually been applied to these techniques ever since. Health care in China today relies heavily upon the practice and principles of TCM, a medical tradition originating many centuries ago and still claiming the pride and respect of the Chinese people today.

Absolutely fundamental to an understanding of Traditional Chinese Medicine and its modern applications to medical practice today is the yin/yang philosophy, or the interdependence of polar opposites.[50] This philosophy represents the clinical importance of balance to Chinese medicine. As explained by George Lewith, yin exemplifies "water, quiet, substance, and night", whereas "fire, noise, function, and day" are characteristics of yang. Each organ of the body is associated with a certain proportion of yin and yang (possibly more of one than the other), and this natural balance is critical to well being.[51] Yin and yang are used to explain the nature or state of not only the patient but also the treatment methods and the external environment. For example, a high fever indicates excess yang. Similarly, spring and summer are yang seasons, whereas fall and winter represent characteristics and influences of yin. A strong, sweet herb possesses a yang

nature, and a bitter herb is primarily yin. These properties react to each other and depend on the other at the same time. This relative balance of internal and external yin and yang properties strongly influences health and illness.[52]

In TCM, the body is comprised of three main components, which maintain the overall functioning of the body: qi, blood, and body fluid. Qi (pronounced "chi") is the concept of bioenergy, which is considered critical to health in China; the idea of qi is foreign to Western medicine, and its complexity makes the concept difficult to quantify. Qi is identified based on two main properties: function and substance.[53] George Lewith states that "the function of an organ depends on the functional qi of that organ."* The functional aspect constitutes the more elusive idea of qi as an invisible force governing the body. Substantive qi is present as either oxygen (referred to as clean qi) or as food. Subsets of these classifications include zhong qi (present in the heart and lungs), nourishing qi (within the channels of internal organs), and defensive qi (immune system). According to the principles of TCM, the breakdown of food in the spleen and stomach results in the production of blood; qi delivers the nutrients from the food to the heart and lung, where qi is then responsible for generating blood. Blood and qi are intricately connected in function and circulation.[54] Body fluid is the liquid portion of the body, such as saliva, sweat, and tears, which protects and lubricates tissue and is formed from the intake of food and drink.[55]

The organs of the body are classified and understood quite uniquely within this medical tradition. In TCM, the main functions of the body are governed by five primary organs, or the zang organs: the heart, liver, spleen, lung, and kidney.[56] Each zang organ represents one of the five natural elements in Eastern philosophy: the heart, liver, spleen,

lung, and kidney correspond to the elements of fire, wood, earth, metal, and water, respectively.[57] These solid organs are functionally paired with one of the fu, or hollow organs, which include the small intestine, gall bladder, stomach, large intestine, and urinary bladder. The spleen is associated with the small intestine and stomach, the liver corresponds to the gall bladder, the lung is paired with the large intestine, and the kidney and urinary bladder constitute the remaining pair.[58]

The heart, as in Western medicine, is regarded as the primary organ of blood circulation. A unique property of the heart in TCM, however, is its role in mental functioning. Mental illness is perceived as a malfunctioning of the heart, whereas the brain is considered to be an extra organ (with respect to overall functionality of the body). The liver is the primary yang organ of the body and is responsible for appropriate storage and flow of both blood and qi. The spleen governs the distribution of food throughout the body and is necessary for normal muscle functioning. Consequently, an obstruction of the spleen can lead to anorexia (in the sense of abnormally low body weight) or muscle weakness. The lung sustains normal respiration (as in Western medicine) but also maintains correct fluid distribution within the body (to lubricate skin and tissue, for example). Growth, development, and reproduction are attributed to the kidney, which is also the primary yin organ of the body. The production of bone marrow and the maintenance of proper fluid levels are also functions of the kidney.[59]

The theory of channels is imperative for diagnosis and treatment in Traditional Chinese Medicine. The channels and collaterals of the body connect the organs of the body and provide passages through which blood and qi can freely flow.[60] Acupuncture points are specific areas on the channels close to the surface of the skin, where interaction

between the internal and external environments is considered the most influential. The small intestine channel of the hand is an example of such a channel; this channel originates in the 5th phalange (the little finger), travels up the arm and past the shoulder, and connects the heart and stomach before terminating in the small intestine. Ringing in the ears, as well as sore throats, indicate a problem with this channel.[61]

As in early Western medicine, illness in TCM is evidence of an imbalance within the body or between the body and its external environment. If the body's qi is altered, the subsequently weakened state of the body provides opportunity for the introduction of pathogens into the body's internal environment.[62] Primary pathogens are classified as either exogenous, mental, or miscellaneous. These pathogens can then produce secondary pathogens, which include phlegm, humor, and stagnant blood.[63]

The six exogenous pathogens are associated with conditions of weather: wind, cold, summer heat, damp, dryness, and heat. Wind (primarily yang) initiates symptoms characterized by motion and change. If pathogenic wind affects the lung, for example, a cough or dry throat may result. Cold, which is yin in nature, commonly overwhelms the yang aspect and causes constriction and obstruction in the affected area. Summer heat (apparent only in the summer, as its name suggests) is characterized by a lack of yin and leads to symptom such as dizziness and nausea. Pathogenic damp disrupts the flow of qi in the spleen and leads to feelings of sluggishness or pain. Invasion of dryness (primarily evident in the fall) commonly affects the lung and may cause dry skin, fever, or thirst. Heat is similar in nature to summer heat but occurs in other seasons and leads to a variety of symptoms, such as fever or coma, depending upon the degree of pathogenic presence.[64]

The seven mental pathogens include overjoy, anger, anxiety, excessive thought, grief, fear, and fright. Each pathogen affects specific zang organs, disrupting proper flow and distribution of blood and qi; this imbalance then leads to a variety of symptoms, such as insomnia and depression. Irregular eating patterns (eating disorders, excessive food intake, and malnutrition), abnormal physical activity, and traumatic injuries are classified as miscellaneous pathogens. The secondary pathogens of stagnant blood, phlegm, and humor result in the abnormal flow of blood and water, leading to blood clots, hemorrhage, and numbness.[65]

The methods by which a Chinese physician achieves a diagnosis exhibit similarities to the diagnostic procedures of Western medicine but also include several unique approaches to the assessment of a patient's condition. TCM diagnosis relies heavily upon the results of these methods. The observation of an individual's pulse is a necessary step to TCM diagnosis. In ancient China, six pulses in each hand (three deep and three superficial), were examined; each of the twelve pulses was connected to one of twelve organs, and the particular state of a pulse could indicate information about the body's condition. A more general and less complicated pulse diagnosis is used today, but the technique is still considered integral to an accurate diagnosis.[66]

In addition to the pulse diagnosis, the face and tongue are then observed. An unusual complexion can indicate imbalance of yin and yang or the presence of pathogens. For example, a red complexion may indicate excess heat within the body, as well as an insufficient presence of yin within a specific organ.[67] Tongue diagnosis is also critical to the assessment of health. Two aspects of the tongue, the tongue proper (the body of the tongue) and the tongue coating, are examined for abnormalities. A normal tongue has a

pink body with a white coating; abnormalities may occur with the thickness and/or color of either portion, and each is indicative of certain medical conditions.[68]

In addition to pulse, tongue, and complexion observation, the patient's history is also essential in TCM. Referred to as the "ten askings" in ancient China, the questions resemble the information a Western physician would request of a patient, such as symptoms, recent physical changes, past history, and exposure.[69] The physician then uses the information acquired from each aspect of examination in order to target a specific organ, pathogen, or imbalance and to prescribe the appropriate treatment for the diagnosed condition.

Recommended treatment in Traditional Chinese Medicine can include acupuncture, moxibustion, herbal therapy, or a combination of these methods. The objective of treatment is to correct the observed imbalance, by restoring the proper proportion of yin or yang to an organ or re-establishing equilibrium between the body and its external environment. Moxibustion is used to reinstate heat in a specific area, by burning moxa on the skin.[70] Herbal treatments are used to restore qi to its original state, if, for example, qi has been obstructed or depleted in an organ. Herbs can open channels and thus maintain appropriate functioning within organ systems.[71] Acupuncture is also used for these purposes; acupuncture points provide direct contact with the external environment and thus a way for the physician to influence the proper flow of qi through these areas.[72]

Synthesis and Conclusions

Thus, the medical traditions of the Eastern and Western perspectives exhibited notable similarities throughout their development and into early modern times. Integral to

both systems was the idea of balance within the body. The Western idea of humors and the Eastern concept of qi individually led to the belief that imbalance was the cause of illness. Treatment then involved the restoration of balance to its initial healthy state. In the middle of the 19th century, however, laboratory science drastically changed medicine in America, transforming the field into the empirical, objective, analytic medical system, which exists today. Lester King stated that "medicine represents a functional aspect of society", meaning that societal changes, popular attitudes, and cultural beliefs influence the practice of medicine within a given group of people. The purpose of a system of medicine for any culture or country is centered on the health of the people within that group. Because medical practices potentially affect every member of a community or society, the beliefs and changes occurring within that community then affect the direction and development of the medical practice for the people. This effect can be seen in the manner in which certain characteristics of American and Chinese culture influenced the advancement of their respective medical systems.

First, the age of the two nations reflects the difference in their modern medical perspectives. Within the scope of history, America is a young nation. The Declaration of Independence was signed approximately two hundred years ago, while the Ming dynasty alone lasted over two hundred years in China. America originated in the idea of change; its founders were not content with the unchallenged rule of monarchs and royalty and decided a new nation held the potential for a better system of government. Having broken away from an "old" system, the ideas of newness and change became fundamental to American society. The Industrial Revolution in America symbolized the extent to which Americans associated change with progress. As more inventions were

formulated in brilliant minds, the new machines were widely accepted for their usefulness and application to daily life. Machines allowed a larger scale of production, and as a result the scope of "progress" forever widened.[73] The acceptance of the new theories in American medicine, originating from the recent introduction of laboratory science, was a logical step within the nation's favorable outlook on progress and change. Old, now incorrect and outdated, ideas of humors and Empedoclean elements were discarded, and soon the future of medicine turned toward more research into the new areas of study. American medicine today continues to reflect a positive attitude toward novelty and innovation; "medical breakthroughs" are continually reported by the media today as indicators of future medical advancements, and the American public largely receives the information with equal hope and enthusiasm.

The people of China, however, perceive age in a much different context. The nation itself has existed for thousands of years, and the sanctity of its ancestry is highly valued by its people. This respect for age and tradition is evident in the fact that the medicine outlined in the Nei Ching Su Wen, a text dating to the 5th century B.C., is largely still in practice today. Medical advancements were achieved not by introducing new concepts and methodology, but through improvements upon existing theories and techniques. For example, during the Ming dynasty (A.D. 1368-1644), China experienced an Industrial Revolution of its own, during which paper mills and textile industries were developed. At this time, interest in acupuncture and herbal therapy increased, and the improvements achieved in these fields were considered indicators of progress for the nation's medical system.[74] Thus, the history and current practices of these medical fields mirror the age of the respective nations and their subsequent view on change.

In a similar context, the respect for entrepreneurship in America differs from the traditional Taoist belief in the value of patience and observation. The results of the Industrial Revolution, as well as urbanization of American cities, revealed to Americans the potential for wealth and success upon an active and ambitious pursuit of an established goal, hence the achievement of the "American dream". This active approach to success was also assimilated into the medical world by researchers and practitioners and explains the speed and enthusiasm with which modern Western medicine redirected its path and created a new system in the 20th century.

The ideals of Taoism are similarly reflected in the slow, methodical manner in which the principles of Traditional Chinese Medicine were developed. Taoism stresses the significance of patience and diligence in all areas of life, and the influence of its doctrine is still evident in present-day Eastern medicine. The ancient texts resulted from many years of tireless observation, and the refined medical practice in China today represents the centuries of continued observation of these techniques.[75]

The growth of American cities and industry in the 20th century greatly stimulated the nation's economy and the overall wealth of the nation. Success meant monetary achievement, and greater success was measured by increasing income, a wealthier lifestyle, and a consequently higher social status. Today, this appreciation and desire for "more" has been extended to virtually every aspect of American life and is evident from the food portions served at restaurants to the number of cars owned by a single family. Likewise, Western medicine has adopted a congruent attitude toward health care; numerous prescriptions and treatments are commonly recommended in order to remedy an illness. One prescription may be necessary to eliminate the infection itself, but

another may be required to counter the side effects of the first medication.[76] In a similar respect, especially with advances in medical research and technology, Western medical treatment has become progressively more invasive, and medical practice continues to support that trend.

Eastern medicine, however, sustains a different concept of diagnosis and treatment. Compared to the Western preference for multiple medications and invasive medical procedures, the medical community in China favors the effects of smaller changes applied to the body. A common misperception of acupuncture involves a body covered almost completely with long needles. In actuality, an acupuncturist uses the smallest number of needles, which he / she believes is necessary for effective treatment. Also, the needle itself is not very large in diameter and, as George Lewith explains, is supposed to "give the body a small but specific stimulus." A Chinese physician may prescribe several herbal remedies to be used in addition to acupuncture or moxibustion, but each method treats the body with subtle and gradual changes.

Additionally, the American and Chinese perspectives on the prevention of illness have differed during the development of both nations. National focus on the importance of prevention has always been inherent within Chinese culture, while Western culture has traditionally lacked such emphasis. In ancient times, a Chinese physician was paid only when the patient was healthy.[77] This reflects a much different concept of the responsibility attributed to the medical world by the two nations. In Western culture, the cure and / or reduction of symptoms have been the main focus of medicine, once an illness has developed. TCM emphasizes the continual maintenance of qi balance, in order to prevent the invasion of pathogens and consequently the onset of disease.

Today, the two systems of medicine are not as separate and exclusive of each other as in previous years. Developments in each medical system are gradually being recognized and even applied by researchers and practitioners in both the East and the West. As more research is conducted in these different areas, the future is likely to entail an even greater interrelation of Eastern and Western medicine.

The impact of Eastern medicine on the Western medical perspective has been a gradual one; the concepts of channels and acupuncture points have not been proven in Western scientific terms, and subsequent skepticism has hindered acknowledgement for the possible effectiveness of TCM methodology. Another significant influence has been the recent recognition and growth of preventive medicine as a separate field in American health care. Beginning in the 1970's, medical schools began to integrate preventive medicine into the curriculum. Preventive medicine in America currently involves educating people on the medical benefits of a healthy lifestyle (exercise, sufficient sleep, and a balanced diet), as well as the risks associated with smoking, drinking, and other poor health habits.[78]

Access to alternative treatments, or medical procedures which have not been scientifically approved by Western researchers, is becoming steadily more available in America today. Although still not well understood in the West, continued reports of success have achieved for alternative medicine a small but notable place in the Western medical world. In 1987, the American Academy of Medical Acupuncture was founded[79], and in 1992, the National Institute of Health opened the National Center for Complementary and Alternative Medicine. By 1997, the American population receiving alternative treatments had risen from 33 % to 42 %. Alternative therapies in America do

vary somewhat from TCM treatments; these include aromatherapy (therapeutic use of plant oils, especially in the air), massage, iridology (examining the eye for signs of illness in a similar manner that a Chinese physician would inspect a tongue), as well as acupuncture and herbal remedies.[80]

In 1994, a significant impact of TCM ideology and practice was seen at the University of Arizona at Tucson, when Dr. Andrew Weil began the Program in Integrative Medicine, the first of its kind in American medical education. The program teaches the influence of the mind on the body, or a holistic approach to health, and seeks treatment in a more natural and less invasive manner, as is seen in TCM. The curriculum also maintains a "philosophy that neither rejects conventional medicine nor accepts alternative medicine uncritically", an approach which may signal a growing interest toward this different idea of health.[81] As graduates of the program begin to practice around the nation, principles of holistic health and alternative medical treatment may prove to be an influential force on the future of Western medicine.

Similarly, the benefits of Western medicine have been recognized and applied within Eastern medicine, specifically as treatment for microbial-related illness, such as infection, and for trauma-related injury. Today, hospitals and medical facilities in China practice both TCM and Western medicine, utilizing pharmacies and medical treatments of both systems. TCM is still primarily used for relief from chronic illness, as well as in prevention and relief from side effects of Western medication.

Initially, the impact of the West was not beneficial to the practice of Traditional Chinese medicine. When Europeans first arrived in China during the Ming dynasty, acupuncture was nationally banned, until the practice was reinstated by Chairman Mao in

the 20th century.[82] Also, during this time, Western medicine was first introduced by missionaries, who established medical schools and practiced surgery throughout the nation. Today, TCM is more heavily relied upon for health care in China, but also continues to utilize Western medicine in areas where TCM is less consistently successful. Advances in Western medical knowledge are also applied to the methods of TCM, as measures of improvement. For example, Western research into neurology has been utilized in order to develop scalp acupuncture and to apply this new field into Eastern medical practice.

Thus, Eastern and Western medicine historically shared a common emphasis on the significance of internal balance to health until the mid-1800's, when laboratory science and subsequent scientific theories forever changed the direction of Western medicine. Today, Eastern medicine continues to utilize and improve upon the practices and theories which originated centuries ago, while Western medicine upholds a more recent pattern of applying empirical research to medical practice. The 20th century witnessed an unprecedented capacity for communication and global relations, and the scope of progress for the 21st century is even greater. As each medical community embraces this potential for communication in the coming years, the divisions between medical systems may become less evident, and the future may see a reunion of once divergent paths.

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