

Montclair State University Department of Anthropology
Anth 140: Non Western Contributions to the Western World
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Week 15 Lecture

China Topic 03

Medical Contributions from China

**This lecture was last updated 07 November, 2019
19 April, 2013 and 15 October 2015**

Medical Contributions from China

The learning objectives for week 15 are:

- to know a few of China's major medical gifts to the world including the discovery of circadian rhythms, smallpox vaccination and acupuncture**
- to appreciate the role of Chinese medicine in world history and in the world today**

Medical Contributions from China

Terms you should know for week 15 are:

- **chi**
- **yin**
- **yang**
- **circadian rhythms**
- **acupuncture**

These slides correspond to and supplement the reading:

Robert Temple. 1998. *The Genius of China: 3,000 Years of Science, Discovery and Invention*. London: Prion Books Limited.

Chapter 5, Medicine and Health, pp. 123–37

Note on the reading: This book has been reprinted several times. If the page numbers above do not correspond to your book, use the Part number or topic title to guide your reading.

Medical Contributions from China

Additional Sources:

James, Peter, and Thorpe, Nick. 1994. *Ancient Inventions*. Esp. pages 42–47;

Needham, Joseph. 1981. *Science in Traditional China: A Comparative Perspective*. Cambridge, MA: Harvard University Press. Esp. pages 85–106.

Panati, Charles. 1987. *Panati's Extraordinary Origins of Everyday Things*. New York: Harper and Row.

Rosen, Samuel. 1971. I have seen the past and it works. *The New York Times*.

Wallnöfer, Heinrich, and Anna von Rottauscher. 1972. *Chinese Folk Medicine*. New York: Mentor Books.

- 1. China gave substantial health and medical contributions to the world**
- 2. Many only recently being recognized**

3. Circulation of the blood – 2nd century BC

- **William Harvey official discoverer in 1628**
- **Got idea from Italian doctors who read al-Nafis of Damascus (d 1288)**
- **Al-Nafis learned it from Chinese**

4. Chinese theory of two fluids in body

- Blood (yin) pumped by heart flows thru arteries, veins and capillaries**
- Ch'i (yang), a form of energy pumped by lungs thru invisible tracts (see later under acupuncture)**

5. Recognized 28 types of pulses – Chinese medicine today relies heavily on comparative pulse taking

5a. Chi (sometimes spelled Ch'i) in Chinese thought is a general energy flow found throughout nature and throughout the universe.

In Western philosophy this kind of belief is called by the name “vitalism.”

6. Attempted to calculate speed of blood flow but got it wrong by 60 times too slow; 28.8 minutes versus correct time of 30 seconds for complete circulation
7. Use bellows and bamboo tubes to simulate and study blood flow

8. Circadian rhythms

- By the 2nd century BC Chinese physicians had observed certain biological clocks that influence people's general feelings and also the intensity of symptoms of certain diseases – asthma patients, for example, suffer more at night when adrenal secretions are least. Pain levels also vary greatly during the day.
- Fevers and body temperatures increase toward evening

9. Acupuncture – see later in slides – was attuned to circadian rhythms as Chinese physicians understood them
10. Circadian rhythms still not well understood by Western medicine

11. Endocrinology

- 2nd century BC isolated sex and pituitary hormones
- Used for diseases and for overcoming sterility
- Hormone crystals extracted from human urine
- Understood difference between androgens and estrogens

12. Deficiency diseases

- Known by at least 200 AD
- Han Yü (762–824) noticed contrasting incidence of beriberi south and north of Yangtze river
- This an early example of epidemiology
- Hu Ssu-Hui between 1314 and 1330 *The Principles of Correct Diet*
- First book to systematize dietary advice for health

13. Diabetes

- 2nd century BC had noticed excessive thirst associated with diabetes
- Realized eating of sweets could be connected
- 7th century AD realized excessive sugar in urine was part of the disease's etiology
- China about 1,000 years ahead of West in understanding diabetes

14. Goiter and thyroid problems

- 7th century AD Chinese understood basics
- Knew that seaweed could reduce problems
- China about 2,500 years ahead of West

15. Immunology

- Smallpox inoculation known by 10th century AD
- May have influenced or been influenced by African practices – see week 09 lecture 02
- Is known to have spread to Turkey then to West
- Chinese kept “innoculum” for month before using
- led to heat death of 80% of virus particles

16. Steroids and Antibodies

- Steroids reduce swellings and inflammation
- Antibodies identify and kill infectious diseases
- Both were possibly developed by Chinese

Sources: Temple, Robert. 1986. *The Genius of China: 3,000 Years of Science, Discovery, and Invention*. New York. Simon and Schuster. Pages 123-137. Needham, Joseph. 1981. *Science in Traditional China: a Comparative Perspective*. Cambridge, Mass. Harvard University Press. Pages 85-106.

17. Ancient Chinese Medical Theory

- The *Nei Ching*: the Book of Internal Medicine
- 1,000 BC
- may be the oldest medical text known. Even by 1,000 BC it was a well-known compilation of medical ideas on which many commentaries had been written.
- [NB: Edwin Smith Egyptian text is 1,600 BC – see week 07 lecture 03]

18. The Nei Ching:

- A fairly accurate understanding of the circulation system, including the difference between veins and arteries;
- An interpretation of the vein/artery distinction in terms of yin, the negative (oxygen-starved veins) and yang, the positive (oxygen-rich arteries), terms that permeate Chinese medical and philosophical thought.

- A basic idea about the function of nerves.
- A theory about the causes of fever: too much yang outbalancing the yin, and prescriptions for life style and medicine intake to avoid fever. Too much yin causes the pulse to weaken.
- Descriptions of several types of pulse beats and theories about what they mean and how to cure them –to bring them back to normal.

18a. Nei Ching continued...

- A theory of 6 yin and 6 yang meridians, or ducts through the body that carry the two types of energy. At 365 places these ducts come to the surface of the body: insertion of one of 9 types of acupuncture needles at these emergence points can affect the balance of yin and yang thereby curing diseases or stopping pain. Western science still cannot account more effectively for the observed successes of acupuncture.

Source: Wallinöfer and Anna von Rottauscher. 1972. Chinese Folk Medicine. New York: Mentor Books.
Pp. 16-17, 27-28, 126-127.

19. More on Chinese medicine....delivery of medical services...

20. The Romans may have had the first public medical system – around 200 BC – in which local town councils paid the doctors who treated everyone otherwise for free.

21. The Chinese system was established by the second century BC –and was financed by the central government rather than local communities. In establishing a national health care system that covered the entire population, China was about 2 thousand years ahead of Europe and Canada.

22. The United States has still not found a way to provide guaranteed health services to its entire population

- in December 2006 New Jersey Senate Democrat Joseph Vitale headed a study commission to make New Jersey the 4th state – after Maine, Massachusetts and Vermont – to guarantee health insurance to its entire population.

2013 Update

22a. This effort has not yet succeeded and the 2010 national “Affordable Care Act” (“Obamacare”) still leaves several million uninsured.

If Republican governors carry out their threats to reject certain provisions of the Act, the poorest members of society will remain uncovered in those states.

23. China's health services were backed up by medical schools where doctors were trained. The world's oldest known medical school is the University of Lo-yang in 493 AD. In India medical schools might be even older.

24. The world's first known hospital comes from China – in 2 AD

25. It has been established that by 400 AD Chinese hospitals were being run by Buddhist charities as well as the government. These may have been the model for Christian charitable hospitals that began appearing in Europe around the same time.

26. During Roman times, doctors had clinics and nursing homes within their own house complexes

27. The first drug stores were set up by the Muslims in Baghdad in the 9th century
- Muslim science developed the branch called saydanah or pharmaceutical science
 - Baghdad pharmacies were regulated by the government for quality control of medicines
28. European pharmacies were set up about 400 years later.

Acupuncture

29. Acupuncture is probably China's most famous medical contribution
30. Acupuncture is widely accepted internationally as an effective treatment for several diseases and injuries

Acupuncture

31. Acupuncture is the insertion and twisting of very fine needles at surface points on the human body.

- Since the 1960s, some needles have been charged with 6 to 12 volts of low-wattage DC current.



Acupuncture

32. Moxibustion is the burning of small sticks of the *Artemisia* (mugwort) shrub on the skin at the acupuncture points

Acupuncture

- Moxibustion can be done in connection with acupuncture
- Some theories say the patient is relaxed by inhaling the moxibustion smoke
- Photos show “cigar moxas”



Acupuncture

33. Acupuncture and moxibustion were known in China from at least the 2nd century BC

34. Several recent Chinese emperors had banned both practices

Acupuncture: 2013 Update

35. The communist government after 1949 made the revival of acupuncture and moxibustion a major part of its medical and public health campaigns
36. The addition of small electrical charges to the acupuncture needles was part of the discoveries made during the cultural revolution of 1966 to 1976.

Acupuncture

37. Chinese physicians have now established among Western scientists their claim that acupuncture can relieve pain, kill infections, and treat asthma, migraines, ulcers, and drug addiction
38. The claim that acupuncture can cure depression and schizophrenia is currently under investigation worldwide

Acupuncture

39. The United States National Institute of Health (NIH) states that as of 2002 it was estimated that 8.2 million adult Americans had tried acupuncture for a wide range of diseases and conditions.
40. The Food and Drug Administration approved acupuncture needles for use in the US in 1996.

Acupuncture

41. Many health insurance plans now cover acupuncture for certain conditions.
42. Several major studies are underway to assess acupuncture's benefits.
43. Very few side effects have ever been associated with acupuncture

Acupuncture

44. Among the uses of acupuncture reported to be successful or possibly successful by the US NIH:

- Reducing post-operative nausea and vomiting
- Curing or ameliorating
 - Addiction
 - Headache
 - Menstrual cramps
 - Tennis elbow

Acupuncture

44a. Acupuncture possible benefits continued...

- Myofascial pain
- Osteoarthritis
- Low-back pain
- Carpal tunnel syndrome
- Asthma
- Aiding in stroke recovery

Acupuncture

44b. Acupuncture benefits continued...

- Fibromyalgia (chronic pain throughout the body – often associated with chronic fatigue syndrome)
- Pain relief in almost all types of pain

45. Chinese physicians use acupuncture as an anesthesia for major surgery

Acupuncture

46. The Chinese theory behind acupuncture postulates 361 or 365 points on the body where channels carry the *yin* [spirit energy] and the *yang* [blood]. The needles release, restore, or drain energy or *ch'i* so as to reestablish the proper balance within the body.

Sources: James, Peter, and Thorpe, Nick. 1994. *Ancient Inventions*. Esp. pages 42–47; Needham, Joseph. 1981. *Science in Traditional China: A Comparative Perspective*. Cambridge, MA: Harvard University Press. Esp. pages 85–106.



Acupuncture

47. Western medicine has still not developed a satisfactory explanation for the obvious and observed healing effects of acupuncture

Acupuncture

48. Western scientists now realize that ancient Chinese physicians somehow developed an understanding of *viscero-cutaneous reflexes*. These are connections between diseases of certain internal organs and their telltale signs at pressure points on the skin

Acupuncture

49. In Western medicine one such reflex is known as *McBurney's point* – a place on the front of the body where appendicitis typically causes a pain point.
50. The Chinese theory is far more complex: four major systems include:

Acupuncture

- tract to the hand (the cheirotelic tract)
 - connects to the lungs
- tract from the hand
 - connects to the large intestine
- tract to the foot
 - connects to the gall bladder
- tract from the foot (podogenic)
 - connects to the liver

Acupuncture

51. Knowledge of these and several related systems tells the acupuncturist where to insert the needle
52. One theory is based on the natural childbirth methods developed in the Soviet Union in the 1920s and based on the research of Ivan Pavlov

Acupuncture

53. Just as the woman's breathing exercises are supposed to interfere with the transmission of pain from the birth canal to the brain –
54. So the twisting needle might block the transmission of pain to the brain from wherever it is originating.

Acupuncture

55. A modern version of this is the “gate theory” of pain, developed by Ronald Melzack, McGill University psychologist, in 1965

56. Certain nerve fibers block the transmission of pain while others facilitate it: the two systems meet at the spinal chord

Acupuncture

57. If the acupuncture needle stimulates the pain-inhibiting nerves, the subject does not experience pain

58. In 1977 Dr. Melzack and colleagues identified several places on the body where pain relief of this kind can be achieved

Acupuncture

59. They all turned out to correspond almost exactly with the acu-points of Chinese medicine – although the researchers had not been aware of the acu points in advance
60. Another theory derives from research into how morphine works to relieve pain.

Acupuncture

61. The existence of morphine receptors in the human brain was previously a mystery – ie. Why people are addicted to morphine seemed counterintuitive because it meant that nature had somehow created the morphine receptors independently of the morphine molecules.

Acupuncture

62. Then it was discovered that the “morphine” receptors in the brain are actually receptors for morphine-like molecules that the human body itself produces.
63. These are called enkephalins and endorphins. They are more than 50 times as powerful as morphine in suppressing pain.

Acupuncture: 2013 Update

64. The body destroys these pain-suppressants after a short time, but if the acupuncture needle continues to stimulate their production – say, through the electrical pulses now used for surgery-based acupuncture – then the pain controlling mechanism might be explained.

Sources: Needham, Joseph. 1981. *Science in Traditional China: A Comparative Perspective*. Cambridge, MA: Harvard University Press. Esp. pages 92–94; James, Peter, and Thorpe Nick. 1994. *Ancient Inventions*. New York: Ballentine. Esp. pages 42–47.

Acupuncture: 2013 Update

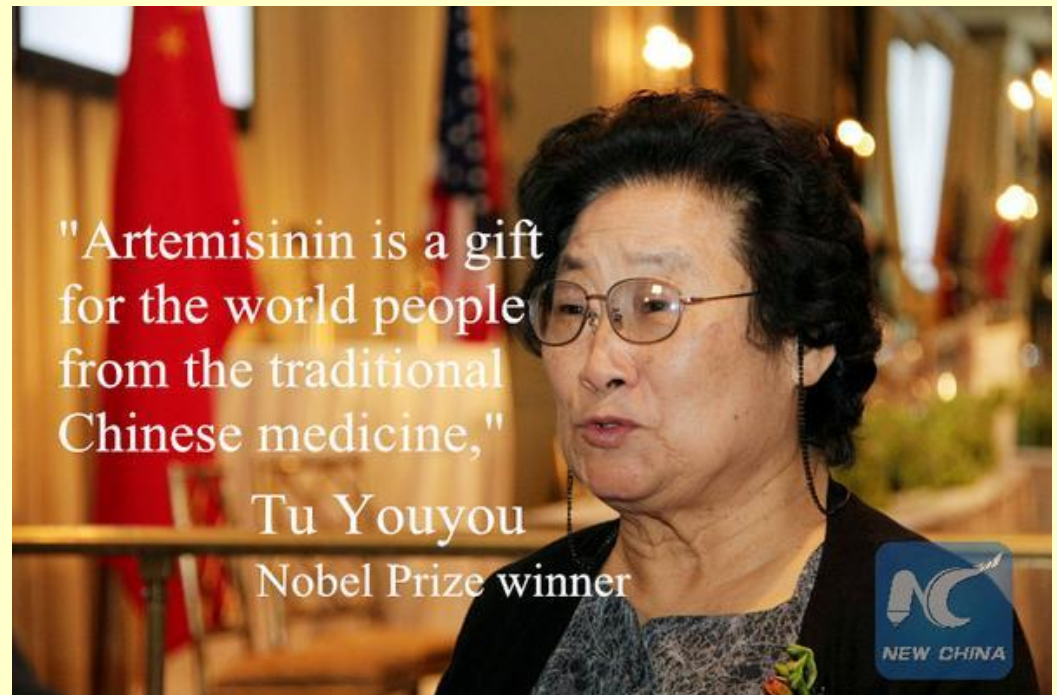
64a. A report in [Scientific American](#) from 30 May, 2010 indicates that in mice, acupuncture needles stimulated the production of adenosine, a chemical that prevents pain signals from reaching the brain. The researchers have speculated that this might be the mechanism in humans by which acupuncture relieves pain.

<https://www.scientificamerican.com/podcast/episode.cfm?id=mechanism-points-to-acupuncture-pai-10-05-30>

Acupuncture and Moxibustion: 2015 Update

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On 12 October, 2015 Tu Youyou became the first Chinese Nobel Prize winner for her research 40 years ago that led to isolating the active chemical – Artemisinin – that combats malaria. (See slides 32–35 earlier in this lecture). The award was in the category of “Physiology or Medicine,” and the Nobel Committee emphasized the Western scientific methods she used. She argued that she also benefited from studying ancient Chinese medical texts.



Acupuncture and Moxibustion: 2015 Update

As a bottom line, we can say that her work represents a modern/traditional amalgam – see the two *New York Times* articles below for interesting information about how Western science and Chinese traditional medicine are both complementary and competitive. Just click the links:

https://www.nytimes.com/2015/10/11/world/asia/nobel-renews-debate-on-chinese-medicine.html?_r=0

https://sinosphere.blogs.nytimes.com/2015/10/06/nobel-china-medicine-tu-youyou-prize/?_r=1

Acupuncture

65. Many other aspects of acupuncture continue to intrigue scientists both in China and in the rest of the world.

66. Here is one example from 1971 that is yet to be explained...

'I HAVE SEEN THE PAST AND IT WORKS'

By SAMUEL ROSEN

What I have to tell is, I know, not going to be believed. I know this because a Chinese surgeon, chief at the major metropolitan hospital in Canton, told me that he had not believed it himself—until he had seen it many times over.

The scene is an operating room such as would be familiar to any surgeon American, European, or Asian. On the operating table is a vigorous man in the prime of life. He happens to be a surgeon himself. The victim of pulmonary tuberculosis, he has agreed with his colleagues that the only way to arrest his disease is to remove the upper lobe of his left lung.

Aseptic procedure is meticulous. I am gowned and masked as I would be here at Mount Sinai Hospital. So are my fellow visitors to China, the renowned cardiologists, Drs. Paul Dudley White of Boston and E. Gray Diamond of the University of Kansas School of Medicine, and our wives. Also present are the surgeon in charge, a scrub nurse and an anesthesiologist. There is one other. She is an acupuncturist.

Acupuncture

She proceeds. She swabs the right forearm of the patient with alcohol. Then, from a variety of extremely flexible, solid, immensely fine needles immersed in alcohol, she selects one and inserts it about two centimeters into the arm, midway between wrist and elbow. The patient and his friend, the surgeon, chat amiably, while this procedure continues. The acupuncturist twirls the needle between her thumb and her first two fingers.

Twenty minutes elapse. The acupuncturist nods to the surgeon. Without the least hesitation, the surgeon takes a scalpel and swiftly cuts an incision from near the spine across the left side of the chest wall to the sternum. Then he takes a scissors-like instrument and cuts each rib away. A thoracic retractor is handed to him. He places it and exposes the chest cavity, revealing the beating heart and the collapsed lung of the patient. Meanwhile, the acupuncturist continues to twirl the needle still inserted in the patient's arm. The anesthetist is idle. The surgeon and the patient converse, and the patient drinks sips of tea from the spout of a teapot held to his mouth by a nurse.

Acupuncture

I have seen one of the most venerable arts of Chinese traditional medicine applied in the most modern of contexts in today's China. I have seen it used, not once, but fifteen times—successfully in brain operations, thyroid adenomas, gastrectomies, laryngectomies and tonsillectomies performed in Canton, Peking and Shanghai. Each time, the standby Western-style anesthetist's skills were not needed, because this relatively new application of an ancient form of medical practice has not only replaced anesthetics but has permitted the patients, in every case to leave

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Source: Wallnöfer, Heinrich, and Anna von Rottauscher. 1972.
Chinese Folk Medicine. New York. Mentor Books. Pp. 168-169.

Acupuncture

the operating room or the dentist's chair alert, smiling, either walking in some cases or on a stretcher in others—and waving his “Quotations from Chairman Mao Tse-tung.”

In short, my American colleagues and I have seen the past and it works.

I have no explanation for this phenomenon, but science has no explanation for many observations that still elude investigation. Neither have Chinese medical men, as they frankly concede. They are investigating acupuncture anesthesia diligently, both at the basic electrophysiological level and in search for more precise definition of just which points on the human body are capable of inducing anesthesia. That the effect is present cannot be denied. Four acupuncture needles inserted in each external earlobe anesthetized a patient who then had most of his stomach removed because of a bleeding ulcer. I saw teeth extracted under the same benign influence of accurately implanted needles which were then energized either by rotation *in situ* or by inducting a weak (6-volt) direct current in each needle.

Acupuncture

We asked what preoperative procedures were used. We were told that patients receive, as they do in this country, fifty milligrams of Demerol before surgery.

One of my colleagues asked whether Chairman Mao's "thoughts" might not have an autohypnotic or autosuggestive effect on the patient.

"Perhaps," the surgeon replied, "but we have been producing the same effects in the rabbit and the cat, and as far as we know they have not been influenced by the thought of Chairman Mao."

Dr. Samuel Rosen, Clinical Emeritus Professor of Otology at the Mount Sinai School of Medicine, and his wife visited China in 1971 as guests of the Chinese Medical Association.

I HAVE SEEN THE PAST AND IT WORKS by Samuel Rosen.
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End of Week 15 Lecture
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Medical Contributions from China