

On Sense and Nonsense of Premodern Medical Theories: the Example of Theories on Smallpox

As medical historians we are used to drawing conclusions from an often very scattered and disparate material on dates, developments, trends, innovations in medicine, on ways of treating diseases – and, what seems to be the most difficult, on the thoughts and actions of the historical protagonists – the doctors and healers of the past. From our material we can seldom be sure whether there is any relationship between a theoretical approach and certain medical actions delineated in a text. We mostly do not know what effect a medical theory had in practice. Actually, we do not even know whether there was any connection between theoretical ideas and medical action.

Medical theories are a product of the human mind which is difficult to examine with the available methodologies of historical understanding, modern as well as postmodern. By comparison with other intellectual creations of the past such as works of art, philosophical ideas, or myths, they are transitory and futile. The reality to which they refer cannot be reconstructed, it has changed fundamentally. The perception of disease and disease entities has changed, and, while the modes of expression of the human body will not completely change, the signs and symptoms are so differently grouped and evaluated that modern disease entities can hardly be discerned.

Theories generally are created to demonstrate explicability. The person who fabricates a theory aims to explain a maximum of phenomena and processes in nature and in the human body using a minimum of categories and category relations. Large and encompassing theories of nature are mostly not created by physicians active in medical practice. Doctors and healers seldom show a strong inclination to theories and theory claims. They are interested in (therapeutic) effects. They connect symptom and therapy or, at best, cause and symptom (in an attempt to prevent disease). The claim to connect conclusively theory and practice and to achieve a certain standard in the explanations of physiological and pathological processes comes rather from the outside. In particular, doctors and healers working in an exposed position such as court physicians, personal physicians, scholar physicians, or teachers organized academically, had/have to explain their medical behavior and to adapt their explanations to a certain theoretical level.

Modern and postmodern methodology of historical understanding has developed a variety of approaches to deal with historical theories and to assess their basic sense or non-sense: the philological, empirical, hermeneutic, deconstructive, reconstructive, phenomenological, sociological, special gender and body theories etc. Every methodology includes a different degree of understanding and/or wanting to understand the intentions of the creators or users of a given theory.

In this paper I will discuss different approaches to historical understanding as they relate to smallpox theories and practices in Chinese medical history. Although the main ideas of Chinese pox medicine are probably common knowledge to most of you (many of you will have read the most valuable thesis of Dr. Chang Chia-feng, a member of your Academy, who has assembled and evaluated numerous sources to the disease of smallpox in Chinese history hitherto unknown) I will at first recapitulate the development of Chinese theories and techniques on smallpox in a more or less chronological order.

The development of theories and practices relating to smallpox

Smallpox probably appeared in China around the fifth century.¹ It was regarded as an illness which was brought in by barbarians and therefore later on often called "barbarian pustules" (*luchuang* 虜瘡). We may assume that it first affected all age groups. In the course of time, the adult population developed a relative immunity and was less at risk: From the 12th century smallpox probably became endemic. It was mostly children who were affected. From then on smallpox was dealt with only in pediatric books.

During the Northern and Southern Song dynasty two famous pediatricians, Qian Yi 錢乙 (1032–1113?) and Chen Wenzhong 陳文忠 (fl. 13th) created two opposing approaches to the treatment of smallpox,² both of which were very influential not only in their own time but also during the whole Yuan and Ming dynasties. Both pediatricians believed that all childhood eruptions have a specific thermic quality. Whereas Qian Yi thought that their thermic quality was hot and recommended a cooling therapy,³ Chen Wenzhong thought it was cold and therefore recommended a warming one.⁴ Both medical authors did, however, not yet clearly differentiate between smallpox and measles. From their opposite approaches we may conclude that, at least until the 13th century, smallpox like all childhood eruptions was

recognized as a disease – as a very cruel disease which in any case had to be treated by drugs. (This was to change in later periods.)

At about the same time a distinct pediatric concept emerged that was to explain the source of early childhood diseases hitherto not dealt with in the Inner Canon (*Huangdi neijing* 黃帝內經): the concept of embryonic poison (*taidu* 胎毒). The embryonic poison was seen as a fluid substance of hot quality that originated at the moment of conception or during the period of gestation: According to most pediatric treatises it was seen as being transmitted at birth from the mother to the new-born child.

With the development of this new concept in pediatrics, different prophylactic and therapeutic methods were developed to eliminate the poison or to prevent the poison being transmitted to the child. As smallpox became to be regarded as an early childhood disease, explanations as to its cause were given now both in terms epidemic *Qi* from the outside and in terms of *taidu* from the inside. The first recipes to prevent smallpox by eliminating (or rather reducing) the embryonic poison at birth can be found in medical literature from at least the beginning of the 14th century.

The concept of embryonic poison for smallpox disease explained a common observation: this was that every human being had to have smallpox once in his/her life. It was believed that everyone carried a more or less strong embryonic poison in her/his body. The violence of the illness was furthermore explained by physical condition, climate and human fate. Current designations for smallpox became "pea pustules" (*wandouchuang* 豌豆瘡) because of their form, "heaven pustules" (*tianchuang* 天瘡, because they were transmitted by the seasonal *Qi* of heaven, or "a hundred year-pustules" (*baisuichuang* 百歲瘡), because they only occurred once in a man's lifetime.

From about the beginning of the 16th century smallpox was given a theoretical shape very different from that of every other specialty or disease in Chinese medicine – a shape that was to dominate until the end of the Qing dynasty. Surprisingly, the sophisticated smallpox theories of the 16th century (which, by the way, reflect enormous clinical experience) are more or less ignored in Chinese medical history, although they actually formed the decisive prerequisite for the development of smallpox inoculation.

The underlying idea for these new theories was that smallpox was no longer considered as a disease, but rather as a normal stage in human development – a kind of threshold condition – that everybody had to go through, because a person’s embryonic poison had to come out. As the course and outcome of smallpox seemed to be mainly a matter of fate and heavenly benevolence, prognosis became even more important than medical treatment. Medical theory reflected these popular ideas by including categories derived from *Yijing*-divination in the differentiation of smallpox conditions. In contrast to the former Song theories, smallpox was now conceived as a disease entity which could manifest in conditions of either heat or cold, with countless subdivisions. The label of fortune (*ji* 吉) was given to such courses of smallpox which occurred at a favorable seasonal period (for instance in spring and summer) and which through all the defined five stages showed no complications (for the detailed clinical categories see table 1) These smallpox courses were not regarded as disease and should therefore not be treated at all. They were termed “favorable“(shun 順).

The physician should treat only such smallpox conditions that showed a so-called “critical“ course (*wei* 危). His treatment should aim at giving those conditions a favorable course. When the physician prognosticated an “unfortunate” (*xiong* 凶) or “unfavorable“ (*ni* 逆) smallpox condition, it was time for his immediate withdrawal so as not to run the risk of being blamed for the death of a patient – a common situation which could have fatal consequences for the physician. A smallpox specialist of the Ming dynasty had therefore often the role of a mere spectator and/or prognosticator. Most of all he had to be careful not to be held responsible for a possibly fatal outcome of the disease. His low status in Ming society aggravated the problem.

In the text of the most famous smallpox specialist of the 16th century, Wan Quan 萬全 (1500-1585), we find the first appearance of the term “smallpox planting” (*zhongdou* 種痘) which was to become the technical term for smallpox inoculation. Wan Quan is therefore often said by medical historians to be one of the first (openly active) inoculators. Wan Quan, however, used the term just as a metaphor to refer to the natural infection of a patient by evoking the image of heaven planting seeds of smallpox on the human skin. His approach was at odds with smallpox theories current in the 16th century. Wan Quan was by no means an inoculator (not even in secret). He saw himself as a medical specialist who had to interpret the distribution and appearance of smallpox signs (like milfoil stalks in divination) on the surface

of the human body in order to judge the possible regular or irregular processes inside the body (tongue and pulse diagnose played a minor role in smallpox medicine) and treat every case, every stage, every condition individually.

It is hardly conceivable that as early as the Longqing period (1567-1572), when the Ming dynasty was still stable, smallpox inoculation was common practice in a county. It also not plausible that physicians at that time could practice inoculation in secret on hundreds of children – as is asserted by a medical author of the 17th century referring to his own grandfather who was also a smallpox specialist and medical author. The technique of smallpox inoculation was extremely dangerous. Nobody would have entrusted their children to a mere amateur. Thus, this smallpox specialist used the common topos that three generations of his family had already practiced inoculation technique so as to reassure people of his own competence. Given the social context of Ming medicine, a common practice of smallpox inoculation in the 16th century or even earlier is not conceivable. At the most, a first experimental use of variolation in a kind of social niche, for instance in some Daoist forms of healing, may have been possible.

At the end of the 16th century it seems that smallpox epidemics actually grew worse. If the medical books can be believed, smallpox epidemics could kill more than half of the affected children. Wan Quan notes in the year 1572, when he retired from his practice: "There emerge more and more difficult cases". One gets the same impression from the writings of other authors who practiced a generation later, such as Sun Yikui 孫一奎 (1530?-1620?), Gong Tingxian 龔廷賢 (fl. 1590) or Wang Kentang 王肯堂 (1549–1613). Of course, this impression could also be due to the fact that people in the Ming dynasty were less willing to accept smallpox as their fate.

Unfortunately, we have no reliable sources on who invented the ingenious technique of smallpox inoculation and what theoretical ideas referred to. We can therefore only draw our conclusions from later sources. Early Chinese smallpox inoculation as described in specialized treatises from the middle of the 17th century relied on the hypothesis that the condition was a stage in everybody's life which could in no way be avoided. The logical model of smallpox inoculation was simple and in fact could also be easily understood by someone not familiar with Chinese medicine. It was, however, at the same time so complicated that it is hardly credible that any individual healer would eventually come to

develop the idea of inoculating healthy children with smallpox, and design the corresponding technique without having had access to the highly developed theoretical concepts of his time, (as suggested by Western medical historians who believe that smallpox inoculation was part of folk medicine in the African and European continents long before the 17th century).

Speaking in modern scientific terms, Chinese inoculation theory corresponded to a functional model involving not more than three hypothetical categories of which the only new one was the concept of *miao* 苗 “sprout”, “seed”). This so-called “sprout of smallpox” was thought to reside inside the ripe pustules and contain all information about the disease. The three categories were more or less thought in the following way:

1. **The embryonic poison** (*taidu* 胎毒), which everybody carried in her/his body and dictated that everybody had to experience the disease, had to be released artificially. It had to be made to come to the surface of the body and be discharged without contaminating the organ systems. (According to most theories it was considered that after birth it “hid” in the very depths of the body – at the heavenly gate (*mingmen* 命門))
2. **The epidemic seasonal *Qi*** (*shiqi* 時氣), seen as a main influential factor for the violence of smallpox disease, had to be avoided at any cost. Smallpox inoculation should therefore be applied on a day when all the climatic conditions were favorable. The specific days had to be carefully calculated by calendar specialists.
3. **The *Qi* of the smallpox sprout** (*doumiao* 痘苗), which was thought to reside inside the ripe pustules and contain all information about the disease, had to be taken from a person with a good constitution who had experienced smallpox without any complications and then (after adequate conservation and preparation) “planted” in another person who did not yet have the disease. The planting of a “smallpox sprout” in or on the human body should make the embryonic poison to come to the surface before the onset of an epidemic cycle and thus provoke a mild course of smallpox.

Although the hypotheses for explaining the mechanism of the disease were not correct – at least from a modern point of view – the way in which conclusions were drawn from a certain functional model for experimental tests (on a large number of patients) can be called scientific in the relevant respects. Whoever the person was who first developed smallpox inoculation

she/he left the common interpretative logic of Chinese medicine diagnostic in favor of a functional model that could be falsified.

As we have seen smallpox inoculation was not meant to avoid the disease but rather to encourage its appearance at a favorable time. Preventive and therapeutic approaches should go side by side. From medical books and gazetteers that Chang Chia-feng has brought to light we know that up to a thousand children in a county received the “sprout” of smallpox at once, either by cotton balls put in the nose, or by being covered with a quilt taken from children who had already safely experienced the disease, or by wearing their clothes etc. Given the low status of physicians and healers during the Ming dynasty and the risk these inoculators took personally, the first experimental practices of inoculation must have been highly successful.

Discussion

Thus far I have tried to reconstruct logically the historical development and the internal logic of theories and practices regarding smallpox by more or less ignoring many details for lack of time or because the historical material is insufficient to make a deeper understanding possible. As you will have noticed, I silently postponed the date for the “invention” of smallpox inoculation to the beginning of the 17th century. This is the earliest date at which I deem it possible that this most ingenious medical practice was developed in China. Such a technique could not be kept secret for hundreds of years. If we can trust the source material of the 17th century, the news of successful inoculations immediately spread like wildfire within the Chinese empire – from county to county, province to province – and as it very soon got the blessing of the Manchu imperial court – from China across the border to the Arabic countries, African and European continents. But this is another subject that I do not want to go into here, because it would lead us too far away.

Let me discuss now alternative interpretations of the development of smallpox theories in China and analyze their underlying hypotheses.

1. The explanation of secret transmission which was used by Needham in his famous article on the origins of immunology in 1980/1987

Needham's explanation relies on a legend created in the 18th century according to which a Daoist monk of Emeishan inoculated the son of the Song dynasty prime minister Wang Dan, in the capital during the era Renzong (1022-1063) (as Chang Chia-feng has pointed out, it should be the era Zhenzong). Although the number of historical facts in the legend are impressive, there are still many contradictions: If it were true that smallpox inoculation did indeed occur at the Imperial court in the 11th century, it would be surprising if that the event did not have a resonant effect throughout the empire. Needham and other Chinese medical historians have attributed the long silence between the alleged first appearance of smallpox inoculation in Chinese history and its actual first appearance in written texts to the tradition of secret recipes (*jinfang* 禁方). Although it may be possible that certain prescriptions for smallpox therapy were transmitted in secret, I hope to have made clear that the underlying theoretical model of smallpox inoculation was quite sophisticated. The technique is therefore not comparable to a simple recipe for which the main problem is to pragmatically try out and combine different ingredients. The theoretical model of smallpox involves complex theoretical categories and category relations which had to be created at first and then designed in different conceptual schemes.

The underlying hypothesis of this approach that I would call empiristic, is still very common among Chinese and Western medical historians is that after a certain amount of observation in nature, the mechanisms and immanent logic of processes become evident – from themselves. In this understanding certain innovations are discoveries that would happen more or less coincidentally after a certain level of experience. Accumulating experience would inevitably lead to progress. Necessary theoretical – including incorrect – reflections which might have preceded or actually caused a finding, such as premodern medical theories that still contain religious ideas, are delineated only in order to argue for the historical date. Such theories are either classified as proto-theories to a corresponding modern theory or disqualified as nonsense.

2. Another still surviving argument for an earlier date of invention is the postulation of the existence of an old quasi homeopathic concept in Chinese medicine – the concept of *yidu gongdu* 以毒攻毒 (“attacking the poison with poison”) As far as I know, this

concept is a very old one indeed, but not used in Chinese smallpox literature before the Qing dynasty. To my knowledge, it was Xu Dachun 徐大椿 (1693-1771), who was the first medical author to explain the development of smallpox inoculation with this theoretical concept. Since its early beginnings, there were many specialized fields in Chinese medicine, every one of which had its own theoretical concepts. As we see in the case of smallpox, a single disease was dealt with in its own specialized literature. (According to a bibliography that I compiled 10 years ago smallpox literature encompassed 255 titles of specialized treatises from the 11th century to the end of the imperial era.) The specialty of smallpox had its own theoretical concepts, different from those in every other field in medicine. If we want to follow the internal logic of a theory or a technique we have to follow its own special development.

3. While the two latter positions in medical history would mainly argue for an earlier date for the development of smallpox inoculation, representatives of modern and postmodern medical anthropology and gender theory would deny any greater interest in dates, inventions or a comparative chronology with achievements in Western medical history. They are rather interested in understanding the specific social context that would make a certain idea or theory possible and/or plausible. Instead of looking for the rational aspect or explanatory value of a premodern theory or practice in a clinical context or in relation to a certain state of experience, (which indeed is very difficult to evaluate because of historical and cultural distance), they try to analyze motives hidden under the language's surface. Thus, medical anthropology views premodern theories mainly as a stock of metaphors deriving from the sociological or political realm, revealing social hierarchies, political ideals and utopias, or reflecting plausible forms of arguing current in a certain period. All endeavors would concentrate on uncovering the strategies of the theories' creators or users (in the jargon of medical anthropology: the (male) professional elite) to secure their own power and livelihood.

Now, in the case of Chinese smallpox theories representatives of gender studies seem to have been handed a typical case of oppression on a plate. The concept of embryonic poison which according to some medical texts is thought to result from the improper diet, thought or behavior of the pregnant woman seems to represent a clear metaphor for a relation of power between the two genders dominated by the male: The

interpretation of gender studies would be: The male professional elite virtually creates a medical theory in order to control women. By using an abstract technical language medical authors design women as polluting their own children and thereby make them responsible for the illnesses of their children. I do not want to go too much into the details of this interpretation which to me seems rather simplistic. Chang Chia-feng has already pointed out that many Chinese medical texts would equally see the passion of men as producing harmful embryonic poison.

At the end of this paper I should prefer to point to the main problem of such sociological interpretations which, by the way, are quickly exhausted, because ancient medical texts do not offer a multitude of such concepts. The main problem seems to me that we are inclined to underestimate what it meant in premodern times (and still means today) to fabricate a theory: that is to explain a multitude of phenomena in their complicated interweaving by a limited set of categories and category relations. Let me come to the end:

The ways of assessing the sense or nonsense of premodern theories are the essentials of our work in medical history. Divergences on ways of our evaluating the historical facts and our interpreting the old texts do not only refer to philological problems or to dates, but often involve basic philosophical positions in the understanding of human thought and behavior in a very broad sense. It seems to me that we have to reflect seriously on the insufficiencies of available methodology in medical history and look out for new ways that would allow an encompassing understanding of the developmental aspects of human thought in a cross cultural perspective.