

## GLIMPSES OF ĀYURVEDA IN MEDIEVAL CHINESE MEDICINE

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Sino-Indian contacts through the Buddhist monks facilitated the entry of ideas of Āyurveda, ancient Indian medicine, into China. It is evident in Buddhist canonical works as well as in popular and historical literature in China, in legends of Buddha and Bodhisattva and in manuscripts, engravings of medicinal recipes and treatments found at excavated caves. These contacts have been studied by a generation of scholars beginning from the early twentieth century. A resurgence of this activity is witnessed in the last quarter. Much new material has come to light through recent studies. It goes a long way to dispel doubts regarding the long-term effect of these medical transmissions. Major references and suggestions are found in Chinese medical works, compilations as well as pharmacopoeia.

The subject matter of these cross-cultural medical contacts is seen to be very diverse. It includes ophthalmology, gynecology, obstetrics, pediatrics, psychology, physical fitness and therapeutics. It ranges from philosophical and theoretical concepts to practical methods like surgery. Present article takes a brief account of varied sources that highlight these medical transmissions. Ophthalmology is in the class of its own since several Chinese works have titles delineating their Indian origin. The time, route and extent of transmissions of the ophthalmic in particular that are studied by the author are reviewed here bringing out their Āyurvedic roots.

**Key words:** Buddhist canon, Dunhuang manuscripts, Gynecology, Kāśyapa, Medical transmissions, Monastic medicine, Nāgārjuna, Ophthalmology, Spread of Buddhism.

### INTRODUCTION

It is a well known fact that the introduction of Buddhism from India into China in early medieval period promoted exchange of a multitude of

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ideas between them. Along with philosophical ideas those related to various arts and sciences were exchanged too. Buddhism being intimately concerned with deliverance from sufferings, medicine played a prominent role in these exchanges. As a matter of fact, Buddhist monks were well acquainted with medicine since it was part of their formal training.<sup>1</sup> It was for the purpose of attending the sick among them. Monks invariably practiced various medical specialties including surgery and provided treatment for the residents of monasteries as well as the lay people. Through these practices ancient Indian medicine found its way into Chinese medicine. Great many scholars have alluded to Sino-Indian Buddhist contacts<sup>2</sup>, Buddhists' interests in medicine<sup>3</sup> and the possibility of transmission of Āyurvedic ideas to China in medieval period. Moreover, a few of them have also expressed doubts regarding any lasting impressions these contacts could have led to<sup>4</sup>. Recent researches in this field by scholars<sup>5</sup> including the author of this article point at noticeable continued influences in various fields of medicine. Here is an attempt to collate some outstanding deductions and point out directions for further study.

Involvement of the Buddhists with medicine, both theoretical and practical, as well as its connection with Āyurveda or ancient Indian medicine is depicted in following diverse ways.

1. Canonical works refer to medicine and its various disciplines in large number.
2. Buddhist monks used to provide medical treatment to the residents of the monastery as well as to lay people and it is reflected in Chinese historical and popular literature.
3. Legends of Buddha and Bodhisattva as *Bhaiṣajyaguru* abound in China, Japan and elsewhere. They refer to Buddha teaching medicine and handing over medical texts to disciples and also bestowing medicines to the needy.
4. Buddhist caves depict engravings of medicinal formulae and pictures of medical treatment given by monks.
5. Chinese medical works and pharmacopoeia from the fifth century AD onwards, include materials suggesting connections with Buddhist medicine that usually have Āyurvedic flavor.

6. Two works on ophthalmology attributed to Nâgârjuna exist in Chinese medicine and they were important standard works studied by the students of ophthalmology till the sixteenth century AD. Their study by the author illustrates parallels with ophthalmic contents of ancient Indian medicine.

### 1. MEDICINE IN BUDDHIST CANONICAL LITERATURE

The Chinese came to know about Buddha and his teaching in the second century BC through their campaigns in Central Asia.<sup>6</sup> Later on, Emperor Ming in the first century AD invited Buddhist monks Kâc̥yapa Mâtaṅga and Dharmaratna to China to teach Buddhist philosophy and to translate Buddhist classics into Chinese. The early articles of *Da cang*, the Chinese Buddhist canon, primarily contained Buddhist philosophical literature expressly created for the Chinese audience.<sup>7</sup> Basic tenets of the school were explained in these texts. Before long, the monks translated standard Buddhist philosophical works into Chinese and they became the earliest part of the canon.

Chinese monks then visited India for pilgrimage and to collect more canonical works. Indian monks also visited China primarily to participate in their translation into Chinese. As a matter of fact, authors of the Chinese Buddhist canon in addition wrote elaborate articles on systematic learning of Sanskrit or *Fan wen* as it is called even today. They compiled specialized dictionaries as well to translate Sanskrit and Pali works into Chinese and Tibetan. These dictionaries form a part of the canonical literature.<sup>8</sup>

After the first century AD, there began a regular flow of Buddhist monks between India and China. While religious interests were the foremost, other scholarly interests also prevailed and significant exchange of scientific ideas took place at this time. These exchanges were related to sciences like astronomy, mathematics, alchemy, medicine, metallurgy etc. Gradually medicine acquired a leading position in these exchanges.

Translation of canonical works into Chinese began in the second century AD. It was at its peak during the three hundred years between the eastern Han (25-220 AD) and the Jin (265-420 AD) dynasties. It continued in the Tang dynasty (618-907 AD). Chinese, Indian as well as Central Asian

Buddhist monks participated in it. To begin with, the translation work was shouldered by the Central Asian monks since they were acquainted with both languages. Kumârajîva was pioneer among them. An Shigao, the prince of the country of An Xi in Central Asia, who reached Lo Yang in 147 AD, translated large number of medical texts into Chinese. Subsequently Song Yun and Hui Sheng in the early sixth, Yi Jing and Xuan Zang in the seventh and Fa Xian in the early eleventh century AD made outstanding contributions. Very few of these works have been studied from the point of view of their medical content and connection with Āyurveda.

Among the medicine-related essays of Buddhist scriptures, some referred to medicine in general<sup>9</sup> and others to some specific discipline of medicine e.g. pediatrics, ophthalmology and women's diseases etc.<sup>10</sup> These references have a deep imprint of ancient Indian medicine. Standard Āyurvedic treatments of internal medicine and surgery for various diseases are mentioned in canonical works. Furthermore, they often mention the *Tridoṣa* theory<sup>11</sup> that forms the basis of diagnosis and treatment in Āyurvedic works.<sup>12</sup>

One of the articles in Chinese Buddhist canon viz. *Neng qing yijie yanjibing doloni jing* - A classic on the spell which can clear (cure) all the eye diseases or *Cakṣurviūodhanavidyā*, was written/translated by Amoghavajra<sup>13</sup>. He contributed a large number of works to Chinese *Tripitaka* between 749 and 770 AD. This particular entry introduces a *Dhāranī* i.e. *Mañtra* or invocation which claims to cure all eye diseases. Although it does not contain material of any real medicinal value, it does touch upon the standard etiology of eye diseases as defined by the *Tridoṣa* theory of Āyurveda. It mentions common symptoms of eye diseases also.

The three do<sup>o</sup>as are translated as follows.

*vāta* - *feng* meaning 'wind'

*pitta* - *huang* meaning 'yellow'

*kapha* - *tan* meaning 'phlegm'

There are numerous references to Nāgârjuna, Jîvaka, and Kâûyapa in Chinese canonical literature. They are with respect to specific medical specialties. Buddha himself was revered as a great physician and was called *Bhaiṣajyaguru/Bhaiṣajyarâja* (medicine teacher or king of medicine) for that reason.

All the three viz. Nāgārjuna, Jīvaka and Kāūyapa are important figures in ancient Indian medicine. Nāgārjuna<sup>14</sup> is traditionally known to have revised *Suūrutasaṃhitā*, the famous ancient Indian medical classic. Nāgārjuna is also known as a renowned Buddhist philosopher of the second century AD and the founder of *Madhyamaka* philosophy of Mahāyāna school of Buddhism. His works form a part of the Chinese Buddhist canon. One of the early references to Nāgārjuna in Chinese *Tripīṭaka* is in the work *Longshu wuminglun* or ‘Nāgārjuna’s Pañcavidyā’.<sup>15</sup> Jñānabhadra, an Indian Buddhist monk who visited China in the sixth century AD, translated this work in collaboration with three other monks. There are references to medical personalities like Jīvaka or Qi po and medicine including ophthalmology, gynecology and obstetrics in this work<sup>16</sup>.

Jīvaka and Kāūyapa’s names are closely related to ancient Indian female pathology and pediatrics. Although famous compendia of Caraka and Suśrūta contain sections on the topic *Kāūyapasamhitā*<sup>17</sup>, also called as *Vṛddhajīvakatantra*, it is only a separate work. Scholars ascribe it a date of fifth century AD while tradition takes it back to the Buddhist period. Interestingly, it mentions China in one of its chapters while suggesting diet according to the place of living, substantiating the early contacts.

An Shikao, a central Asian prince-convert-monk translated two works in 147 AD that were accredited to Jīvaka and Kāūyapa. They were *Nai nu qi po jing* or ‘Jīvaka’s classic on women’s standard diseases’<sup>18</sup> and *Ka ye jin jie jing* or ‘A classic of Kāūyapa’s prohibitions (for pregnant women)’<sup>19</sup> whereas Fa xian in the early eleventh century AD translated *Ka ye xian ren shuo yi nu ren jing* or ‘A classic on women’s diseases as told by the sage Kāūyapa into Chinese.’<sup>20</sup> The fact of Kāūyapa’s name being linked with female pathology in Chinese literature as back as the second century AD goes a long way to support earlier date for Kāūyapa. Bagchi has studied above three works and translated them into English.

Indian drugs and their applications too were mentioned in canonical literature. An Indian monk named *Bao si wei jing* or *Ratnacintā*, was translator of Buddhist works. He wrote *Quanshiyin pusa ruyi moni tuoloni jing* (A Classic of Bodhisattva Avalokiteśvara’s *Cintāmaṇi dhāraṇi*)<sup>21</sup> in Tang dynasty. It mentions medicines like *Hu jiao* (Barbarian’s or foreigner’s spice) or

pepper (*Piper nigrum* L), *Niu huang* (meaning cow's yellow or *Gopitta* since 'pitta' was translated as *huang*) or dried gallstone of domestic cattle etc in the treatment of eye diseases. These drugs are often used in preparations of Āyurvedic medicines.

## 2. BUDDHIST MONASTERIES AND MEDICAL PRACTICE

Since Indian monks, who visited China in the medieval period, were conversant with certain medical skills as a part of their official instruction, they extended medical service to Chinese nobles and laity whenever needed, probably out of compassion. Yet, the purpose of easy endorsement thereby of Buddhist philosophy in the new land cannot be ruled out.

Episodes of Buddhist monks curing patients with their very effective medicine are frequently recorded in Chinese history. Quite a few of these episodes are about Buddhist monks performing cataract surgery. Tang poets Bo Juyi (772-846 AD) and Liu Yuxi (772-842 AD) wrote about Nāgārjuna's work on ophthalmology and a Brāhmin removing the cataract using a golden probe.<sup>22</sup> This part is discussed in a separate section below.

**Medicine for Beriberi:** Beriberi is a deficiency disease that is now known to be caused by deficiency of thiamine. It was widely prevalent in the world in ancient and medieval period. Beriberi was a known disease in ancient China and it is recorded under different names in medical literature. Su Jing in the seventh century AD revised the famous Tang pharmacopoeia called or *Xinxiu bencao* (Newly revised materia medica)<sup>23</sup> and noted down a remedy as 'Brāhmin's prescription' in his pharmacopoeia. Later in 752 AD a large compendium *Waitai miyao fang* (Medical secrets of an official) was written by a famous medical writer/compiler Wang Tao of the Tang dynasty.<sup>24</sup> The author in the chapter on *Jiao qi* or Beriberi records a prescription by the name 'Brāhmin's prescription'. These historical records suggest that a successful cure for Beriberi was made known to the Chinese in all probability by an Indian Buddhist monk.

## 3. LEGENDS OF MEDICINE: BUDDHA AND BODHISATTVA

As one looks back in history, many medical personalities attain a legendary status for lack of concrete historical evidence. It is often witnessed

in ancient Indian medicine also. Jīvaka, Kâúyapa, Caraka, Suúruta, Nâgârjuna etc were great medical men of their time, considering large body of references as well as works attributed to each one of them. Their dates and contributions are only surmised after analyzing a labyrinth of literature and legends. References to these famous medical personalities of ancient India in Chinese literature could be useful in the process.

There exist many anecdotes of medicine about Buddha and Bodhisattva as well as Buddhist monks in Chinese culture. They relate to their delivering medical instruction, medicines, and medical texts. Cui Zhuti, the Minister of revenue in the Tang dynasty, wrote two books viz. *Cui shi zuanyaofang* (Mr. Cui's collected medicines) and *Chantu* (Birth maps). He attributed the success of his midwifery to the work of a Buddhist monk Tan Luan. Both Cui Zhuti's and Luan's works are no more extant. Their only source is *Waitai miyaofang*.<sup>25</sup>

Similarly, there exists much information about introduction of ophthalmic knowledge from China into Japan through the Buddhists. It exists in the form of facts intertwined with legends. A monk Majima Seigan practised couching of cataract and founded an ophthalmic school in Japan in the fourteenth century AD. This school continued to be active till the seventeenth century. As one story goes the monk Majima Seigan had a dream when the *Bhaiṣajyaguru* appeared before him and taught him the methods of healing and the next morning he found a book that gave details of eye disease treatments. Majima Seigan then repaired a temple of *Yi wang shen yao shi si* (Temple of the king of healing *Bhaiṣajyaguru*) located near the city Nagoya. This temple was allegedly founded in 802 AD.

Again, a Japanese monk in the sixteenth century AD stated that his ancestor went to China in 809 AD and studied under Longshu pusa or Bodhisattva Nâgârjuna. Although the Japanese legends are not reliable historical evidence, their date go close to the first Chinese reference (Bo Juyi's) to the earlier ophthalmic work attributed to Bodhisattva Nâgârjuna. Aforesaid Japanese legend supports the idea that 'Nâgârjuna's discourse on eyes' was indeed being circulated in China in early ninth century AD. Whether in reality the Japanese traveller monk learnt ophthalmic techniques from a monk by that name or he is simply referring to the famous book is hard to

verify. Nevertheless, the fact that this ophthalmic work found its way to Japan and promoting ophthalmic studies there, is a certainty.<sup>26</sup>

As monastic medicine flourished, gradually some monasteries became famous for their medical treatment. 'The monastery of benevolent aid' or Huijisi is located at the Xiaoshan county in Zhejiang province of China. It is locally called Zhulinsi or the Bamboo grove monastery. It has been famous for its practice of medicine till the nineteenth century AD. Monks of "Bamboo grove monastery" were regarded as experts in the treatment of women's diseases i.e. gynecology and obstetrics.<sup>27</sup>

This monastery was first founded in the tenth century AD at the site of a pre-existing temple. According to a legend, the tenth century chief of the monastery once hosted a wandering monk who gave him a medical treatise on women's diseases. These remedies turned out to be very effective and the tradition of treating women continued from then onwards at this place.

Handbooks on efficacious medicines were printed in this monastery and they were distributed among needy people during the eighteenth and the nineteenth centuries. These formulae were revered as excellent remedies for number of gynecological diseases like infertility and miscarriage. These formulae were successfully used by modern gynecologist as well.<sup>28</sup> These remedies of handbooks given out by the 'Bamboo grove monastery' need to be studied from the viewpoint of their possible relation to ancient Indian medicine.

#### **4. PICTURES OF MEDICAL TREATMENT AND ENGRAVINGS OF MEDICINAL FORMULAE IN BUDDHIST CAVES**

Buddhism thrived in China during the Tang dynasty and number of Buddhist monasteries and temples increased rapidly. Early Tang emperor Tai song (627-650 AD) in the seventh century AD developed contacts with several Indian kingdoms including Magadha that was ruled by the powerful king Harṣavardhana. Nalanda University therein was a famous seat of learning at that time and Chinese Buddhist monks visited it in large numbers. Since interests in Indian medicine and other sciences were growing, these monk-travelers wrote about the distinctive nature of Indian medicine in their

travelogues as seen in *Da tang xiyuji* (The great Tang dynasty travels in the western regions).<sup>29</sup> By and by, under the directive of Tang emperors, Chinese monks and visitors searched for famous Indian doctors and drugs. Practice of medicine in Chinese monasteries also grew rapidly and it is reflected in literature, cave inscriptions and carvings of the time.

Ancient caves at Dunhuang (of the sixth to tenth century AD) in the North-western part of China on the other hand symbolize cultural development when Buddhism was at its peak. The famous monk traveler Xuan Zang after his long stay in India returned to the then capital Changan via Dunhuang. Being located on the ancient Silk-road, as Buddhism prospered during the Tang dynasty Dunhuang became a major center for trade and travel.

Although beginning of the construction of caves at Dunhuang is traced back to the Sui (581-618 AD) dynasty, it was during the Tang that major caves, murals and sculptures were carved.<sup>30</sup> The caves were excavated in early twentieth century and thousands of paintings, Buddhist scriptures and historical documents were brought to light. Among the vast number of manuscripts that were discovered there are some medical manuscripts as well.<sup>31</sup> Interestingly, Dunhuang medical manuscripts contained one named *Qiposhu* or *Jivakapustaka*. It was written both in Sanskrit and Brâhmi. It is extensively studied by Chen Ming.<sup>32</sup> Jean Filliozat found that some five formulae in *Qiposhu* are from *Carakasamhitâ*.<sup>33</sup>

Likewise, *Longmen* (Dragon gate) caves at Loyang in north China contained three caves called the 'Cave of prescriptions' where medical formulae are engraved under the title *Longmen fang* or *Longmen* (Dragon-door) formulae. Considering the style of engraving and literature and patterns of Buddha statues around it, scholars ascribe the date of seventh century (650-653 AD) to it. It has been noted that *Longmen* formulae and *Qiposhu* or *Jivakapustaka* found in Dunhuang caves have much in common. Lately, *Longmen* formulae have been translated into English and they form another source for studying ancient medical contacts.<sup>34</sup>

*Qiposhu* employs special drugs in its formulae viz. *San guo* and *San xin*. *San guo* (three fruits) are *Haritakî* (*Terminalia chebula* Retz), *Vibhîtaka*

*Terminalia belerica* Retz) and *Āmalakī* (*Phyllanthus emblica* L) i.e. *Triphalā* in Sanskrit. *San xin* (three pungent or hot substances) are *pippalī* (*Piper longum* L), *marīca* (*Strychnos potatorum* L) and *úuñthī* (*Zinziber officinalis* Rose) i.e. *Trikatū* in Sanskrit. Both are common ingredients of ancient Indian medicine.

Cave paintings at Dunhuang are based on Buddhist stories. A number of these frescoes depict Buddhists' medical practices. Illustrations of medical treatments throw light on medical techniques of the time.

##### 5. MEDIEVAL CHINESE MEDICAL WORKS AND COMPILATIONS INCLUDED MATERIAL FROM BUDDHIST MEDICAL WORKS AND PHARMACOPOEIA

As seen earlier, Sino-Indian Buddhist contacts facilitated entry of ancient Indian medical ideas into China and Buddhist monks in the capacity of travelers, translators and at times medical practitioners, acted as catalysts in this process. Soon after, some of these ideas entered main stream Chinese medicine and they were reflected in contemporary medical works and compilations.

Many intermediary works that formed a link between the earliest ideas that entered through the Buddhist channel and their final depiction in popular Chinese medical texts, are no more extant. They are listed in ancient bibliographies e.g. *Sui shu* (the bibliography of Sui dynasty) and indicate the extent of transmission.

**Tao Hongjing, Sun Simiao and their works:** Writings of Tao Hongjing (456-536 AD), famous medical writer, alchemist and pharmacologist depicted influence of Buddhists' four element theory *Si da* for the first time. A century later famous medical writer and physician Sun Simiao (581-682 AD) referred to Indian medicine in a big way in his two compilations.<sup>35</sup>

Sun Simiao was conversant with all the three established philosophies of medieval China viz. Confucianism, Buddhism and Taoism. He emphasized the need for love and compassion as advocated by the Buddhist philosophy for ethical medical practice.<sup>36</sup>

Transliterated Sanskrit terms pointing at Āyurvedic connections are numerous in Sun Simiao's works e.g. *Agatuo wan* meaning 'Agada pill'. He introduced concepts of healing of mental sufferings by means of *Chan* or *Dhyâna* and *Yoga*.<sup>37</sup> He mentioned a method of Indian massage *An mo fa* in his writings and called it a Brâhmin's method.<sup>38</sup> Sanskrit name for jaundice i.e. *Kâmalâ* as *Ka mo lo* also appears in this text.<sup>39</sup>

Sun Simiao's famous work *Beiji Qianjin yaofang* [important medicinal formulae (worth) a thousand (pieces of) gold] also contains a lot of medicinal formulae attributed to Jîvaka.<sup>40</sup> In a section on medicinal substances he writes, "A great medicine man of India Jîvaka has said that all things under heaven have efficacy."<sup>41</sup> It is a quote from *Carakasamhitâ*.<sup>42</sup> Interestingly, the term Sun Simiao used for a suppository in the 'Womens' diseases' section of *Beiji Qianjin yaofang* viz. *zuodaoyao* (sitting-directing medicine)<sup>43</sup> goes close to the general term used for enema and suppository in Sanskrit viz. *Netrabastî* (directing-sitting medicine).<sup>44</sup> Although suppositories were used in China earlier as seen in *Sengshenfang* (profound medicinal formulae of the Buddhists), a fifth century work; they were not under this name.<sup>45</sup> These facts hint at Sino-Indian medical ties in the field of gynecology and obstetrics that have been overlooked. They also underscore the need for further investigation.<sup>46</sup>

Sun Simiao explicitly recorded surgical treatment for glaucoma or *Qing mang*, so also for several other eye diseases like polypus of the white part of the eye for the first time.<sup>47</sup> This was the entry of Indian techniques of ophthalmic surgery into China. Detailed account of these techniques was recorded about a century later in the work attributed to Nâgârjuna.

**Wang Tao's *Waitai miyao*:** Wang Tao (670-755 AD), a famous personality of early Tang period, was an influential government official as well as a physician. He wrote a large compendium *Waitai miyao fang* (Medical secrets of an official). In its chapter on ophthalmology he included sections from a work of Indian origin viz. *Tianzhu jing lunyan* (Indian classic of discussion on eyes). Just as the name indicates, its contents indeed depict parallels with ancient Indian medicine.

According to the 'Indian classic of discussion on eyes' merely physical factors like sense organs and supply of bile, are insufficient for vision. It considered 'divine knowledge' as a necessary factor. It states "The flow of 'qi' from the liver channel to the eye, three lights, the divine knowledge, all combine to enable the eye to see". *Carakasamhitā* also includes factors other than physical to explain the phenomenon. It states "Conscious perception arises from the fusion of the *ātman* (self), mind, senses and sense organs"<sup>48</sup>.

Furthermore, the 'golden probe' method for the removal of cataract that became very famous in following centuries in China was first mentioned in this compilation *Waitai miyao fang*.<sup>49</sup> Aforesaid 'Brāhmin's prescription' for Beriberi is recorded in this very text.<sup>50</sup>

**Tanba Yasuyori and his compilation *Yixinfang*:** Tanba Yasuyori, an 984 AD Japanese scholar, made a collection of Chinese medical works viz. *Yixinfang* (Central medicinal formulae).<sup>51</sup> It contains material from Jin (265-420 AD) to Tang (618-907 AD) dynasties. Therefore it provides material for the study of history of medicine of that period. Interestingly, among the sources used by the compiler of *Yixinfang* there are many related to Buddhism in general and to the Indian experts mentioned above.<sup>52</sup>

This work records over ninety articles related to *Qipo yifang* (Jīvaka's Medicine). *Qipo yifang* does not exist as a separate work.<sup>53</sup> These articles include formulae for women's diseases like stomach ache during menstruation, pregnant woman's chest pain, stomach ache and problem of continued bleeding after delivery, post partum stomach and chest pain, treatment for infertility etc. On the other hand, the incomplete work *Qiposhu* or *Jivakapustaka*, that was excavated in Dunhuang is a short version meant for practical use and it is much quoted in other medical works.

*Yixinfang* also quotes a Sanskrit *Dharaṇī* or Mantra from a canonical work *Da ji tuo lo ni jing* (*Mahādharmaṇī* classic). It is to be uttered to ease difficult childbirth.<sup>54</sup> It consists of writing a Sanskrit Mantra in vermilion ink on the skin of a pheasant that is then burnt to ashes, mixed with clear water and given to the pregnant woman to drink.

As the use of Indian drugs increased, they found entry in Chinese pharmacopoeia, e.g. *Bencao shiyi* (A supplement for the pharmaceutical natural

histories) of 725 AD by Chen Zangchi. He added 368 new entries including *A-le-bo* or *Āragvadha* (*Cassia fistula* L). He also wrote about *Bolomen zaojia* (Brâhmin soap bean tree).<sup>55</sup> Duan Chengshi also described it in his work *Yu yang za zu* (Miscellany of Yuyang Mountains) of 860 AD.

## 6. NĀGĀRJUNA'S WORKS ON OPHTHALMOLOGY

Entry of ancient Indian ophthalmic knowledge into China was closely related to Buddhist philosophical assumptions. Buddha was looked upon as a surgeon who could extract four poisoned arrows that of anger, greed, pride and jealousy which pierced the humans. Furthermore, an analogy of Buddha removing the screen of ignorance using the probe of wisdom to the surgeon who removes cataract and enables the patient to see clearly was very popular. A symbolic operation upon cataracts with the *Úalâkâ* or probe is described in these texts. The rite consisted of the master initiating the inspirer by touching his eyes with a metallic wand, saying, “*Vaidya-Râja* or ‘king of physicians’ clears away the membrane or *paṭala* of ignorance with a golden probe”. It is cited in *Vairocanasûtra* in Chinese translation.<sup>56</sup> This metaphor gave rise to numerous references to eye surgery in the Buddhist canon.

Thus, ideas related to ophthalmic surgery, which was a novelty to Chinese medicine, were introduced in the second century AD onwards. This was an unintentional transmission in its initial stages. The earliest entry of these ideas in the form of analogies and metaphors, as seen in the Buddhist literature, probably made the Chinese aware of new therapeutic possibilities. Since ophthalmic surgery was not practiced in China at that time, it alerted the Chinese Buddhists, some of whom were also medical men like Sun Simiao. Chinese ophthalmology took a turn at this point.

From the eighth century AD onwards, about a century after Sun Simiao's works, three ophthalmic classics related to India came up one by one. The first work was ‘Indian classic of discussion on eyes’ of the eighth century AD mentioned above. The other two were attributed to Nâgârjuna. They are *Longshu pusa yanlun* (Discourse of Bodhisattva Nâgârjuna on eyes) of early ninth century AD and *Longmu zong lun* (Nâgârjuna's

comprehensive discourse) of late eleventh century AD. These works were functional as standard textbooks till sixteenth century AD in China.<sup>57</sup>

These ophthalmic works played a major role in the early development of Chinese ophthalmology. They considerably changed the state of the discipline and eventually led to the integration of two medical systems in many ways. All these three works exist to this day as sections in medieval medical compilations.

Entry of Indian ophthalmic information encouraged the founding of a separate discipline of ophthalmology in Chinese medicine. From an empirical approach as seen in *Neijing*, the earliest text attributed to the legendary Yellow Emperor, it led to its systematic study in the medieval period. As a result of exposure to Indian ophthalmology, eye diseases were classified on the basis of eye anatomy as in the case of *Aṣṭāṅgahṛdaya*, *Suśrutasamhitā* and other major Ayurvedic classics. Broad categorization in Chinese works was on the basis of inner and outer parts of the eye. A clear differentiation between various kinds of glaucoma, between glaucoma and cataract and also between various kinds of cataracts is found in Nāgārjuna's later work even more explicitly than in ancient Indian works that in fact was their starting point. In the last section of the chapter on ophthalmology, Suśruta discusses some additional eye diseases that are not included in the seventy-six cases discussed by him. These are traumatic injuries and children's eye diseases.<sup>58</sup> Likewise, Nāgārjuna's work also discusses traumatic/external injuries and children's eye diseases in the last sections.

Efficacy was evidently the foremost reason behind the introduction and acceptance of cataract surgery in China. To a degree, Fan Ka Wai considers the reason may be that this kind of surgery could be interpreted in terms of acupuncture that was an age-old practice.<sup>59</sup> Various aspects of surgery are taken into consideration in Nāgārjuna's works. They included suitable time and place for surgery, selection of method and instruments, pre-operational cautions and care, contra-indications of surgery, precision in surgery, indications of success or failure, post-operational care including that of bandage, diet, movements etc. All this goes close to Ayurvedic information contained in classics.<sup>60</sup>

### CONCLUDING REMARKS

Sino-Indian Buddhist contacts that began in the first century AD resulted in exchange of ideas between the two culture areas. Alongside philosophical ideas, those related to science and technology, were transmitted too. In view of the Buddhists' involvement in liberation from sufferings for the mankind, they had an inherent interest in medicine. It led to transmission of ideas related to ancient Indian medicine or Āyurveda into China. It was depicted in diverse ways. Chinese Buddhist canon contains several medicine-related works. Allusions to Indian monks and their medical skills are numerous in Chinese historical and popular literature. Legends of Medicine Buddha and Bodhisattva abound in Chinese culture. Again, Buddhist cave engravings included pharmaceutical formulae too. Buddhist monks often provided medical service to the community. Lastly, standard Chinese medical works and compilations of succeeding periods incorporated Āyurvedic information.

Even though the entry of Āyurveda into China through the Buddhist connection is known for some time, the foremost historian of Chinese science Joseph Needham and a few others too doubted any long-lasting influence. Recent studies by the author and other scholars help dispel these reservations. Medieval Chinese ophthalmology was the foremost to depict Indian influence. Three existing Chinese ophthalmic works related to India reveal parallels with ancient Indian ophthalmology in many ways. The key similarities being classification of eye diseases based on anatomy of the eye and incorporation of cataract-removal and other surgical methods that also form major part of ophthalmic surgery in Indian works. Although ophthalmology outshines others, fields like gynecology, obstetrics, pediatrics, psychology, physical fitness etc also made their stamp. All in all Buddhist medicine contributed in the evolution of various disciplines of medicine in medieval China and had a share in overall medical practice of the time. To it goes the credit of introducing ancient Indian medicine with its concepts, techniques and drugs into Chinese culture.

This is by no means an exhaustive review of Sino-Indian medical exchanges of medieval period. Yet it points at the period, path and scope of medical contacts between these neighboring cultures and indicates direction and sources for further study.

## List of Chinese characters

<i>Agatuo wan</i> 阿迦陀丸	<i>Fa xian</i> 法賢
<i>A-le-bo</i> 阿勒勃	<i>Fan fan yu</i> 翻梵語
<i>An mo fa</i> 按摩法	<i>Fan wen</i> 梵文
<i>An Shigao</i> 安世高	<i>Fan yi ming yi ji</i> 翻譯名義集
<i>Bao si wei jing</i> 寶思惟靜	<i>Fan yu qian zi wen</i> 梵語千字文
<i>Beiji qianjin yaofang</i> - 備急千金 要方	<i>Feng - 風</i> <i>Fo yi jing</i> 佛醫經
<i>Bencao Shiyi</i> 本草拾遺	<i>Fo zhi shen jing</i> 佛治身經
<i>Bo juyi</i> 白居易	<i>Guanshiyin pusa ruyi moni tuoloni jing</i> 觀世音菩薩如意摩尼 陀羅尼經
<i>Bolomen zaofa</i> 波羅門皂莢	<i>Hu jiao</i> 胡椒
<i>Chan</i> 禪	<i>Huang - 黃</i> <i>Huangdi neijing</i> 黃帝 內經
<i>Chantu</i> 產圖	<i>Huijisi</i> 惠濟寺
<i>Chen Zangchi</i> 陳藏器	<i>Jiao qi</i> 腳氣
<i>Chu yiqie jibing tuoloni jing</i> 除一 切疾病陀羅尼經	<i>Ka mo lo</i> 迦摩羅
<i>Cui shi zuanyaofang</i> 崔氏纂要方	<i>Ka ye jin jie jing</i> 迦葉禁戒經
<i>Cui Zhiti</i> 崔知悌	<i>Ka ye xian ren shuo yi nu ren jing</i> 迦葉仙人說醫女人經
<i>Da cang</i> 大藏	<i>Liao zhi bing jing</i> 療痔病經
<i>Da ji tuo lo ni jing</i> 大集陀羅尼 經	<i>Liu yuxi</i> 劉禹錫
<i>Da tang xi yu ji</i> 大唐西域記	<i>Longmen</i> 龍門
<i>Duan chengshi</i> 段成式	<i>Longmu zong lun</i> 龍木總論
<i>Dunhuang</i> 敦煌	

- Longshu pusa yanlun* 龍樹菩薩  
眼論  
*Longshu wuminglun* 龍樹五明論  
*Longshufang* 龍書方  
 Loyang 洛陽  
*Luo bu na shuo jiu liao xiao er ji bing jing* 囉哺拏說救療小兒疾病經  
 Ma Wangdui 馬王堆  
*Nai nu qi po jing* 奈女耆婆經  
*Neng jing yiqie yanjibing doloni jing* 能淨一切眼疾病陀羅尼經  
 Niu huang 牛黃  
*Po lo men bi si jing* 婆羅門避死經  
*Qianjin yifang* 千金異方  
*Qi Po da shi zhi ren wu zang liu fu nei wan bing ji bu yi chang nian bu lao fang* 耆婆大士治人五臟六腑內萬病及補益長年不老方  
*Qi Po e bing fang* 耆婆惡病方  
*Qi Po tang* 耆婆湯  
*Qi Po wan bing wan* 耆婆萬病丸  
*Qi po wan* 耆婆丸  
*Qipo maijuejing* 耆婆脈訣經  
*Qipo yiyao fang* 耆婆醫藥方  
*Qiposhu* 耆婆書  
*San guo* 三果  
*San xin* 三辛  
*Sengshenfang* 僧深方  
 Sokokyosho 沮渠京聲  
*Sui shu* 隋書  
 Sun Simiao 孫思邈  
*Tan - 痰*  
 Tan Luan 曇鸞  
*Tan Ma lo chen* 曇摩羅讖  
*Tang fan wen zi* 唐梵文字  
 Tang 唐  
 Tao Hongjing 陶弘景  
*Tian zhu guo* 天竺國  
*Tianzhu jing lun yan* 天竺經論眼  
*Waitai miyao fang* 外台秘藥方  
 Wang Tao 王濤  
*Xinxiu bencao* 新修本草  
 Xuan Zang 玄奘  
 Yi Jing 義淨  
*Yi wang shan yao shi si* 醫王山藥師寺  
*Yinhai jingwei* 銀海精微

<i>Yixinfang</i> 醫心方	<i>Zhou chi jing</i> 咒齒經
<i>Yoga</i> 瑜珈	<i>Zhou mu jing</i> 咒目經
<i>Yu yang za zu</i> 酉陽雜俎	<i>Zhou shi qi bing jing</i> 咒詩氣病經
<i>Zhi chan bing mi yao fa</i> 治禪病秘 要法	<i>Zhou xiao er jing</i> 咒小兒經
<i>Zhongyi yan kexue fazhan jianshi</i> 中 醫眼科學發展簡史	<i>Zhulinsi</i> 竹林寺
	<i>Zuodaoyao</i> 坐導藥

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#### NOTES AND REFERENCES

1. A study of biographies of some traveler monks reveal the fact that they had studied *Pañcavidyā* i.e. astronomy, writing or script, mathematics, medicine and tantra in their early life. See P.K. Mukherji, *Indian literature in China and the Far East*, Prabhasi Press, Calcutta, 1931, p 139.
2. P.K. Mukherji (1931), op. cit.  
D.P. Singhal, *Buddhism in East Asia*, Books & Books publishers, New Delhi, 1984.
3. Mark Tatz (Tr.)-'*Buddhism and Healing*': *Demieville's article 'Byo' from Hobogirin*, (University Press of America, Lanham, New York, London, 1985; Unschuld, Paul - *Medicine in China, A History of Ideas*, Berkley, Los Angeles, London: University of California Press. 1985; Charles Leslie (ed.) *Asian Medical Systems: A Comparative Study*. Berkeley: University of California Press, 1976; Jyotirmitra - Ayurvedic material in Buddhist Literature, *The Jyotirloka Prakashana*, Varanasi, India, 1985, p. 48.
4. Needham Joseph, *Science and Civilization in China*, Vol V part 3, Cambridge University Press, 1976. Also, Unschuld, Paul (1985) op.cit.
5. Chen Ming, The Transmission of Indian Ayurvedic Doctrines in Medieval China: A Case Study of *A'tāṅga* and *Trido'a* Fragments from the Silk Road, *Annual Report of The International Research Institute for Advanced Buddhology at Soka University for the Academic Year 2005*, Vol ix, March 2006, Liao Yuqun - *Yindu gudai yaowu fenlei fa ji qi keneng dui zhongguo yixue zhansheng de yinxiang* 印度古代藥物分類法既其可能對中國醫學展生的印象 - *Journal of Dialectics of nature*, Vol 17, Sum no 96, No2, 1995, p 62.

6. Singhal, D.P. op cit.
7. Nanjo Bunyo, *A Catalogue of the Chinese translations of the Buddhist Tripitaka*, Oxford 1883.
8. Takakusu & K. Watanabe (ed.), *The Taisho Shinshu Daizokyo - The Tripitaka in Chinese* (Society for the publication of the Taisho Tripitaka. Tokyo, 1968). See TT1420 pp. 957, 966.  
 TT 2130 *Fan fan yu* (Translating Sanskrit)  
 TT 2131 *Fan yi ming yi ji* (Collection of translated names) *Mahāvīyūtpattī*  
 TT2133 *Fan yu qian zi wen* (A thousand characters of Sanskrit language)  
 TT2134 *Tang fan wen zi* (Tang Sanskrit script)
9. TT.795- *Fo zhi shen jing* or [A classic on Buddha curing the (diseases of) body] - An Shigao  
 TT.1323 – *Chu yiqie jibing tuoloni jing* or *Sarvarogapraūamanīdhārānī* (A classic on spell to cure all diseases) by Amoghavajra in the eighth century AD  
 TT.1325 *Liao zhi bing jing* or *Arsaprasamanasutra*. (A classic on curing all hemorrhoid-related diseases) by Yi Jing who visited India between 671-696 AD.  
 TT.793 - *Fo yi jing* (Buddhist medical classic) by Jikuritsuen & Shiotsu
10. TT.131- *Po lo men bi si jing* (A Brahmin classic to avoid death) and TT.554 - *Nai nu qi po jing* (Jīvaka's classic on women's standard diseases) by An Shigao in the second century AD.  
 TT.1326 - *Zhou shi qi bing jing* [A classic of incantation poem for the *Qi* (seasonal) epidemic diseases]; TT.1327- - *Zhou chi jing* [A classic to exhort (diseases of) teeth]; TT.1328 - *Zhou mu jing* [A classic to exhort (diseases of) eyes], *Cakṣurvisōdhanavidyā*, TT.1329- - *Zhou xiao er jing* [A classic to exhort (diseases of) children] - all by *Tan Ma lo chen* (*Dharmalocana*?) during the period of 381 to 395 AD.  
 TT.1324 - *Neng jing yiqie yanjibing doloni jing* (A classic on a spell to cure all eye diseases) - *Cakṣurviūodhanavidyā* by Amoghavajra,  
 TT.1330- *Lu bu na shuo jiu liao xiao er ji bing jing* A classic told by Rāvaṇa on curing of children's diseases - Fa xian who visited Nalanda around 1001 AD.  
 TT1691- *Ka ye xian ren shuo yi nu ren jing* (A classic on women's diseases as told by the sage Kāūyapa)- by Fa xian  
 TT.620 - *Zhi chan bing mi yao fa* (Secret methods to cure the *Chan* diseases) – Sokokyosho ~457 AD.
11. *Tridoṣa* theory- According to this theory body is sustained by the three elements or 'dhātu' which are *kapha*, the phlegm, *vāta*, the wind and *pitta*, the bile. These are essential for the growth and maintenance of the body, a balance of the three keeps body

in good, healthy state. An imbalance of the three on the other hand causes illnesses. Thus when a *dhātu* is rendering an adverse effect due to its being in deficit or excess, it is called a '*doṣa*'. Any illness is characterized by either one or more of the *doṣas*. Sometimes all the three *doṣas* together cause a disease in which case it is called as due to *sannipāta* or concurrence of the *doṣas*. See *Carakasamhitā: Sūtrasthāna*, 7-39 and *Vimānasthāna*, 6-13. *Aṣṭāṅghṛdaya: Sūtrasthāna*, 11-1 to 3, also in *Sūūrutasaṃhitā* with *Dalhanaṭīkā: Sūtrasthāna*, 14-20.

12. *Sūūrutasaṃhitā* and *Carakasamhitā* famous Sanskrit works on medicine that are traditionally taken as belonging to the first millennium BC. Their present versions are taken to be revisions made in the early first millennium AD.
13. TT 1324
14. Nāgārjuna is a controversial figure in Indian history. He is related to a number of interrelated areas of medieval scholarship like Buddhist philosophy, tantrism, medicine as well as alchemy. See Deshpande Vijaya - 'Nāgārjuna and Chinese Medicine' in *The Human Body, at the Crossroads of Multiple Indian Ways of Knowing* Papers Presented to Arion Rosu by his Colleagues and Friends on the Occasion of his Eightieth Birthday, *STVDIA ASIATICA*, VOL. IV (2003) - V (2004), p. 241. Also see K.R.Srikanta Murty - 'Nāgārjuna' in *History of Medicine in India* (Ed. P.V. Sharma), INSA, New Delhi, 1992, p. 291 and Mabbett I. - "The problem of the historical Nāgārjuna revisited", *Journal of the American Oriental Society*, 118 (1998) 332.
15. *Wu ming lun* or *Pañcavidyā* comprised of five sections viz. *Sabdaiūāstra* (science of words, grammar, philology), *Bhaiṣajyaeāstra* (medicine), *Ūilpaiūāstra* (architecture), *Mañtraūāstra* (probably tantra with alchemy) and *Mudrāūāstra* (printing). See Vijaya Deshpande, "Medieval transmission of alchemical and chemical ideas between India and China". *Indian Journal of History of Science*, 22.1 (1987) 15-28.
16. TT1420 p 957, 966.
17. P.V. Tewari, *Kāūyapa-saṃhitā (Vṛddhajīvākīyam Tañtram vā)*, Text with English translation and Commentary, (Haridas Ayurveda Series) Chaukhamba Viswabharati, Varanasi, 1996.
18. TT.554
19. TT1469
20. P.C. Bagchi, *Rāvaòakumārtañtra*, Indian Culture, VII, 269-286.  
P.C. Bagchi, *Ka ye xian ren shuo yi nu ren jing, Kāūyapa<sup>oo</sup>iproktastrīcīkītsāsūtra*, Indian Culture, IX, 53-64.]
21. TT 1083
22. Ji Xianlin, 'Indian ophthalmology in ancient China', '*Researches in National Studies*', Vol.2, 1994, p555, also see Levy Howard S (tr.) - *Translations from Po Chu-i's collected works*, Paragon Book Reprint Corporation, New York, 1971, vol. 2, p58, and Unschuld,

*Medicine in China — A History of Ideas*, Berkley, Los Angeles, London: University of California Press. 1985, p 146.

23. *Xinxiu bencao (Tang bencao)* compiled by Su jing in 659 AD – Shanghai guji publications 1981.
24. Wang Tao (8<sup>th</sup> Century AD)- *Waitai miyao* - People’s Hygiene Publications, 1996.
25. Jen-Der Lee, Childbirth in Early Imperial China, *NAN Nü*, 7.2 (2005) 216-286.
26. Saiichi Mishima, *The History of Ophthalmology in Japan*, 2004, chapter 6 entitled ‘The Birth of Eye Specialist in Japan and Development of ophthalmology in the 16<sup>th</sup> and 17<sup>th</sup> centuries’.
27. Yi-Li Wu, “The Bamboo Grove Monastery and Popular Gynecology in Qing China,” *Late Imperial China* 21.1 (June 2000): 41-76.
28. Yi-Li Wu(2000) op. cit. p 48.
29. TT2087
30. Archaeological excavations Ma Wangdui (second century BC) unearthed manuscripts that included some medical manuscripts. It points at the long tradition in China of storing the documents and relics in the caves for safe-keeping. Ma Wangdui tombs belong to the time before the entry of Buddhism into China and medical manuscripts therein thus represent indigenous practices in ancient China.
31. Vivienne Lo and Christopher Cullen (eds), *Medieval Chinese Medicine: The Dunhuang Medical Manuscripts*, London: Routledge Curzon, 2005.
32. Chen Ming, *Yixinfang zhong de Qipo Yiyao fang lai yuan kao, jianyu Dunhuang (Qiposhu) zhi bijiao*, (An inquiry into the source of *Qipo Yiyao fang* in *Yixinfang* and simultaneous comparison with *Qiposhu* of Dunhuang), *Wenshi*, Vol 2, 2002, p145.
33. Jean Filliozat, *Journal Asiatique*, 235 (1946-47) 134-5.
34. Zhang Ruixian (ed.), *Explanations of Longmen Recipe*, Zhengzhou, 1999.
35. *Beiji qianjin yaofang*, [Important medicinal formulae (worth) a thousand (pieces of) gold], written by Sun Simiao (581-682 AD), first published in 652 AD, People’s Hygiene Publications Beijing, 1987
36. Tatz, Mark op cit pp. 370-88.
37. *Qianjin yi fang*, pp. 200, 201.
38. *Beiji qianjing yaofang*, p. 580.
39. *Tian zhu guo - Qian jin yi fang*, p. 201  
*Qi po wan - Qian jin yao fang*, p. 276

- Agatuo wan- Qian jin yi fang*, pp. 326-7
- Dhyana Qian jin yi fang*, p. 201
- An mo - Qian jin yao fang*, p. 580
40. *Qianjin yifang* – Chapter 12 *Yang sheng, Yang lao shi liao di si, Qipo wan*. Also *Beiji qianjin yaofang* -Chapter 12
- Qi Po wan bing wan* - Jivaka's ball medicine for ten thousand illnesses
- Qi Po e bing fang* Jivaka's medicines for illnesses caused by evil spirits
- Qi Po tang* – Jivaka's soup
- Qi Po da shi zhi ren wu zang liu fu nei wan bing ji bu yi zhang nian bu lao fang* – Jivaka's medicine for prolonging life without getting old
41. *Beiji qianjin yifang*, chapter *Yao ming di er*, 藥名第二 p8
42. *Carakasamhitā, Sūtrasthāna* -.26 -12, 29.
43. *Beiji Qianjin yaofang* Vol 2: Women's Recipes, Seeking a Child.
44. *Sūrutasaṃhitā, Cikitsāsthāna*, chapters 35 to 38
45. *Yixinfang* p 432
46. *Role of foreign medicine in shaping Sui and Tang gynecology*, unpublished ms, paper read in the 56<sup>th</sup> annual meeting of the Association for Asian Studies at San Diego, March 4-7, 2004.
47. *Beiji qianjin yaofang* (1987) p. 127
48. *Carakasamhitā, Sūtrasthāna*, chapter 1, verses 8 to 14
49. *Zhongyi yanxue fazhan jianshi* (A simple history of the development of Chinese ophthalmology), in *Zhongyi yanxue* (A Study of Chinese Ophthalmology), People's Hygiene Publications 1985 p. 1
50. Wang Tao - op. cit. p. 519.
51. Tanba Yasuyori - *The essentials of medicine in ancient China and Japan*: Yasuyori Tamba's *Ishimpō* translated with introduction and annotations by Emil C.H. Hsia, Ilza Veith, Robert H. Geertsma Leiden: Brill, 1986.
52. *Qipofang*- Jivaka's pharmaceuticals, *Sengshenfang* - Profound pharmaceuticals of the monks, *Longshufang* – Nāgārjuna's pharmaceuticals, *Longmenfang* Dragon (Nāga) gate pharmaceuticals, *Daji duoluoni jing* - Mahādharmaoī classic, *Qipo maijuejing* – Jivaka's classic on pulse examination.
53. Tanba Yasuyori (1986) - op. cit. – p. 160.
54. Tanba Yasuyori (1986) - op. cit. p. 464.

55. *Glenditsia Sinensis*
56. Mark Tatz (1985) op. cit. p. 10, 11. “*Tathagata* - ‘Thus Come One’ surpasses mundane physicians in ophthalmology because he understands how to cut off the cataract (*timira*) of ignorance with the iron of wisdom.’ This is an idea expressed in *Samyuktagama* (T 99:36:259c-260c) attributed to the eastern Jin dynasty (350-431 AD). These kinds of references to cataract removal operations are especially numerous in early Buddhist texts which were translated from original Buddhist canon into Chinese.”
57. Joseph Needham, op cit Vol V, part 3, Cambridge University Press, 1976, p. 163. Also see N. Sivin (ed.) – *Science and Civilization in China*, Vol. 6 Pt. 6, Cambridge University Press, 2000, pp. 107, 108.
58. *Sūūrutasaṃhitā Uttaratāntra*, 19- 1 to 8 and 8 to 16 respectively
59. Fan Ka Wai – ‘Couching for cataract and Sino-Indian medical exchange from the sixth to the twelfth century AD’ in *Clinical & Experimental Ophthalmology* 33 (2), 188–190, 2005.
60. See Vijaya Deshpande - ‘Indian influences on early Chinese ophthalmology: Glaucoma as a case study’ in *BSOAS*, 62.2 (1999) 306-322 and Vijaya Deshpande - ‘Ophthalmic Surgery - A chapter in the history of Sino-Indian medical contacts’ - in *Bulletin of the School of Oriental and African Studies*, *BSOAS* 63.3 (Oct. 2000) 370-88.

### BIBLIOGRAPHY

- P.C. Bagchi, *Rāvaṇakumārtaṇtra*, Indian Culture, VII, 269-286.
- Chen Ming, *Jivaka-Pustaka – A bilingual Sanskrit and Khotanese medical classic from Dunhuang caves* (2001:1).
- Chen Ming, The Transmission of Indian Ayurvedic Doctrines in Medieval China: A Case Study of *Aṣṭāṅga* and *Tridoṣa* Fragments from the Silk Road, *Annual Report of The International Research Institute for Advanced Buddhology at Soka University for the Academic Year 2005*, Vol ix, March 2006.
- Chen Ming, *Yixinfang zhong de Qipo Yiyaofang lai yuan kao, jianyu Dunhuang (Qiposhu) zhi bijiao*, (An inquiry into the source of *Qipo Yiyaofang* in *Yixinfang* and simultaneous comparison with *Qiposhu* of Dunhuang), *Wenshi*, Vol 2, 2002, p145. 陳明 - 醫心方中的耆婆醫藥方來源考 - 兼與敦煌(耆婆書)之比較, 文史
- Vijaya Deshpande, *Role of foreign medicine in shaping Sui and Tang gynecology*, unpublished ms, paper read in the 56<sup>th</sup> annual meeting of the Association for Asian Studies at San Diego, March 4-7, 2004.
- Vijaya Deshpande, ‘Nagarjuna and Chinese Medicine’ in *The Human Body, at the Crossroads of Multiple Indian Ways of Knowing* Papers Presented to Arion Rosu by his Colleagues and Friends on the Occasion of his Eightieth Birthday, *STVDIA ASIATICA*, VOL. IV (2003) - V (2004), p. 241.

- Vijaya Deshpande, 'Ophthalmic Surgery - A chapter in the history of Sino-Indian medical contacts', *Bulletin of the School of Oriental and African Studies, BSOAS*, 63.3 (October 2000), 370-88.
- Vijaya Deshpande, 'Indian influences on early Chinese ophthalmology: Glaucoma as a case study', *BSOAS*, 62.2 (June 1999) 306-322.
- Vijaya Deshpande, 'Medieval transmission of alchemical and chemical ideas between India and China'. *Indian Journal of History of Science*, 22.1 (1987) 15-28.
- Fan Ka Wai, 'Couching for cataract and Sino-Indian medical exchange from the sixth to the twelfth century AD', *Clinical & Experimental Ophthalmology*, 33.2 (2005) 188-190.
- Ji Xianlin, 'Indian ophthalmology in ancient China', *Researches in National Studies*, 2 (1994) 555.
- Jyotirmitra, *Ayurvedic material in Buddhist Literature*, The Jyotirloka Prakashana, Varanasi, India, 1985, p48.
- K.R.Srikanta Murty, 'Nāgārjuna' in *History of Medicine in India* (Ed. I.V. Sharma, INSA, New Delhi, 1992).
- Jen-Der Lee, "Childbirth in Early Imperial China" *NAN Nü*, 7.2 (2005) 216-286(71)
- Leslie Charles (ed.), *Asian Medical Systems: A Comparative Study*. Berkeley: University of California Press, 1976.
- S Levy Howard (tr.), *Translations from Po Chu-i's collected works*, Paragon Book Reprint Corporation, New York, 1971.
- Liao Yuqun, *Yindu gudai yaowu fenlei fa ji qi keneng dui zhongguo yixue zhansheng de yinxiang* (Ancient Indian method of classification of medicines and its possible influence on the evolution of Chinese medicine) 印度古代藥物分類法及其可能對中國醫學展生的印象 - *Journal of Dialectics of nature*, Vol. 17, 96.2 (1995) 62.
- I. Mabbett, "The problem of the historical Nagarjuna revisited", *Journal of the American Oriental Society*, 118 (1998) 332.
- P.K. Mukherji, *Indian literature in China and the Far East*, Prabhasi Press, Calcutta, 1931.
- Nanjo Bunyo, *A Catalogue of the Chinese translations of the Buddhist Tripitaka*, Oxford 1883.
- Needham Joseph, *Science and Civilization in China*, Vol V part 3, Cambridge University Press, 1976.
- Saiichi Mishima, *The History of Ophthalmology in Japan*, 2004.
- D.P. Singhal, *Buddhism in East Asia*, Books & Books publishers, New Delhi, 1984.
- N. Sivin (ed.), *Science and Civilization in China*, Vol. 6 Pt. 6, Cambridge University Press, 2000.

- Sun Simiao (581-682 AD), *Beiji qianjin yaofang* [Important medicinal formulae (worth) a thousand (pieces of) gold], People's hygiene publications Beijing, 1987.
- Tanba Yasuyori, *The essentials of medicine in ancient China and Japan: Yasuyori Tamba's Ishimpo* translated with introduction and annotations by Emil C.H. Hsia, Ilza Veith, Robert H. Geertsma Leiden: Brill, 1986.
- P.V. Tewari, *Kāūyapa-saṃhitā (Vṛddhajīvakīyam Tañtram vā)*, Text with English translation and Commentary, (Haridas Ayurveda Series) Chaukhambha Viswabharati, Varanasi, 1996.
- Unschuld, *Medicine in China – A History of Ideas*, Berkley, Los Angeles, London: University of California Press. 1985.
- Vivienne Lo and Christopher Cullen (eds), *Medieval Chinese Medicine: The Dunhuang Medical Manuscripts*, London: Routledge Curzon, 2005.
- Wang Tao (8<sup>th</sup> Century AD), *Waitai miyao* - People's Hygiene Publications, 1996.
- Xinxiu bencao (Tang bencao)* compiled by Su jing in 659 AD – Shanghai guji publications 1981.
- Yi-Li Wu, "The Bamboo Grove Monastery and Popular Gynecology in Qing China," *Late Imperial China* 21.1 (June 2000) 41-76.
- Zhang Ruixian (ed.), *Explanations of Longmen recipe*, Zhengzhou, 1999.