CHAPTER 6

The Birth of the Eye Specialist in Japan and the Development of Ophthalmology in the 16th and 17th Centuries

Knowledge of the Indian technique of cataract couching was transmitted to Japan already by the tenth century and mentioned in *Ishinpo* in 984. However, *Ishinpo* did not have a detailed description of the couching technique, and there is no record of this surgery having been performed soon after the appearance of this book.

In the early Kamakura era, that is, the twelfth and thirteenth centuries, there developed a style of art known as "picture scroll with narration." Contemporary painters produced many fine examples of such picture scrolls, some of which are preserved and registered today as National Treasures. Tosa Mitsunaga painted a picture scroll with the title of "Physician Who Repairs the Eyes" (Figure 4-8) sometime in the early Kamakura period. This picture scroll indicates that cataract couching was actually performed in the preceding late Heian period as well as in the Kamakura period (see Figure 5-8). The technical skill of the physicians seems to have been quite rudimentary, however, and the narration accompanying Tosa Mitsunaga's picture scroll clearly states that the surgery was a failure. There are also records among diaries of Heian aristocrats suggesting that Chinese surgeons came to Kyushu and performed cataract couching.

In the middle of the fourteenth century, a monk named Majima Seigan came to be in charge of a temple in Owari of present-day Nagoya and began to treat patients with eye diseases. In particular, he had an excellent technique of cataract couching. His success became famous throughout Japan, and many patients from remote areas came to receive his treatment. In addition, many practitioners came to learn from him, and there developed under him a large school of ophthalmology. The teaching was by verbal transmission and tutorial training, so that the school did not leave any written record or teaching text until the sixteenth century. Those who learned under him nevertheless dispersed to the various regions, practiced the treatment, and formed their own way of teaching. Thus, ophthalmology developed through verbal transmission for over two hundred years beginning with Majima Seigan. Then in the sixteenth and seventeenth centuries, many practitioners began to put their methods into writing in the confidential teaching texts or *hidensho* that remain preserved until today.

This chapter describes the activities of Majima Seigan and the development of Japanese ophthalmology during the sixteenth and seventeenth centuries based on these *hidenshos*.

1. MAJIMA SEIGAN

In Majima near Owari, now a western suburb of the city of Nagoya, there was a temple with the name of Iozan Yakushiji (Temple of the King of Healing, Bhaisajyaguru Buddha). Legend says that this temple was founded around 802, but it was burned and severely damaged during wars toward the end of the Kamakura era. The monk Majima Seigan raised money and repaired the temple in 1357. According to Ogawa Kenzaburo (1904), Bhaisjyaguru Buddha appeared in a dream to Seigan and told him that the Buddha would give him methods of healing so he could begin treating the people's eye diseases. The next morning Seigan found a book in front of the statue of the Buddha. The book described all the necessary methods of

Figure 6-1: Majima Seigan (? - 1379): The First Eye Specialist in Japan with highly skilled performance of cataract couching and Founder of Majima School of Ophthalmology. Many other ophthalmology schools originated from his students and spread throughout Japan. (from Soda, 1989: Photo: by Behringer-Ingelheim)

treating eye diseases, and Seigan studied it and started treating patients in the temple. This is nothing but a legend, and it does not tell us how Seigan actually learned ophthalmology and what exactly was the book in question.

Okuzawa Yasumasa found three descriptions that would allow us to make a hypothesis about Seigan's learning. In *Anmoku kudensho*, one of the *hidensho* of the Majima school written in 1570, the epilogue of the text reads as follows: "*Ton'isho* (see Chapter 5) should be referred to mainly for general treatment, but it does not give any useful description for the treatment of eye diseases. Consequently, forty-eight eye diseases and their treatment are described in this text. The content was given by Kiha [an ancient Chinese physician] or from the book imported from the Great Tang." The Tang dynasty ended in 906, but the Japanese continued to refer to China by the dynastic name of Tang. In another *hidensho* written in 1601, a successor to Saigen named Majima Sakyo Hogen stated that "in the first year of the Daido period," our ancestor went to China and studied under Longshu Pusa (Nagarjuna Bodhisattva). Since then, he wrote further, the teaching has been transmitted over forty-nine generations. A few years later in 1610, another descendant, Majima Ichimisai, wrote that Longshu Pusa transmitted the teaching to Majima "on the first day of the third month in the first year of the Daido period." Although there was a period known as "Daido" in Japan, corresponding to 816-809 CE, it was written with different characters than those used by Ichimisai.

Obviously one cannot readily believe these descriptions, but they suggest some interesting points that would allow us to surmise what happened to the contemporaries of Majima Seigan. In Chapter 4, we discussed that Tanba Yasuyori had read *Longshu Pusa Yanlun*, Nagarjuna Bodhisattva's ophthalmological treatise, and had cited this book in his *Ishinpo*. The *Longshu Pusa Yanlun* was certainly imported in the early ninth century, but it is not clear whether this book was available to Seigan 350 years later. The Tang dynasty ended in 906, and the Northern Song Dynasty ruled China from 960 to 1127 while the Southern Song survived until 1279. The Mongolian invasion began in the early thirteenth century, and the Yuan

dynasty of the Mongols ruled China from 1279 to 1368. The time of Seigan's learning corresponds to that of the Yuan dynasty in China, but no significant ophthalmological books were imported from Yuan China. However, the preceding Northern Song dynasty was very enthusiastic about medical books as seen in the example of *Taiping Shenghui Fang*, a one-hundred-volume medical handbook completed by imperial order in 992 (see Chapters 4 and 5). Volumes 32 and 33 are devoted to ophthalmology. Volume 32 develops a new theory of Five Rings based on traditional Chinese philosophy and gives detailed descriptions of external eye diseases and their treatments. Volume 33 provides a theory of internal disturbances of the eye and describes the technique of cataract couching in detail. This surgical description is almost identical to that of *Longshu Pusa Yanlun* and is obviously of Indian origin. Another great achievement of the Song dynasty is *Shengji Zonglu* (Comprehensive Treatise on Sage's Advice) completed from 1111 through 1117. This is a great collection of prescriptions in two hundred volumes, and those for eye diseases are abundant. However, the surgical technique of cataract couching is missing from this book. According to Ishihara (1956), the printing blocks completed in Song were taken by the Jin's invasion and only later recovered by the Yuan. Only the ones that the Yuan could manage to print were imported to Japan. This may explain why this comprehensive medical book was imported in an incomplete form. In the Kamakura period, exchange with the Song dynasty was very active. The Japanese *Ton'isho* was written based on the Chinese *Taiping Shenghui Fang*. The first human anatomy of internal organs also was imported to Japan (see Chapter 5). In addition, Kajiwara Shozen, the author of *Ton'isho*, wrote the fifty-volume *Man'anho* in 1327 by referring to the above-mentioned *Shengji Zonglu*.

Thus, the book with a detailed description of cataract couching available in Japan during the fourteenth century was either *Longshu Pusa Yanlun* or *Taiping Shenghui Fang*. In any case, the language for the surgical procedure is almost identical in both books. Since Seigan was a monk capable of reading Chinese and knew about Nagarjuna Bodhisattva, it is possible that the book that described the cataract couching was ascribed to Nagarjuna. Probably Seigan worked hard, and there is a further possibility that some Chinese monk transmitted the technique to Majima.

2. CATARACT COUCHING AS DESCRIBED IN *LONGSHU PUSA YANLUN*, NAGARJUNA BODHISATTVA'S OPHTHALMOLOGICAL TREATISE

Since teaching in the early generations of the Majima school was only by verbal transmission, there are no written records left behind. It is therefore impossible to know the actual text of cataract couching that Seigan read. However, we have copies of *Longshu Pusa Yanlun* and of *Taiping Shenghui Fang* preserved until today. As discussed in Chapter 4, the text of *Longshu Pusa Yanlun* is very likely a good translation of the Indian *Susruta Samhita, Uttara-Tantram*. Hirschberg found a Sanskrit text of the *Susruta Samhita* and

had it translated into German. In the twentieth century, K.L. Bhishagratna of Calcutta translated *Susruta Samhita* into English; and Ito Yaeji (1891-1958) further translated it into Japanese in 1971. Since the Chinese text of *Longshu Pusa Yanlun* is very likely a translation of *Susruta Samhita*, we believe the text of this book is the earliest, if not the first, translation of the Indian text on cataract couching that existed in the early ninth century. It has been therefore of great historical significance to translate the text into English and preserve the record. Since it was too difficult for us to translate the text of classical Chinese, we asked Professor Por T. Hung of the National Taiwan University in Taipei for help, and he gave the following translation.

METHODS OF USING A NEEDLE TO CURE CATARACT
(from *Longshu Pusa Yanlun*, Nagarjuna Bodhisattva's Ophthalmological Treatise)
Translated into English, by Prof. Por T. Hung of the National Taiwan University, from the text copied in 1823 from the Korean Archive; the original text was probably present in China and Japan in the first half of the ninth century.

The manifestation of cataract was very versatile. It can be divided morphologically into the following four types: (1) surface irregular or uneven type, (2) surface smooth type, (3) brittle ice type and (4) snow-white type. In addition to these four common types, some were classified as floating type and sinking type. Before learning to perform cataract surgery, the beginner should learn to identify properly which type of cataract the patient has and to grade the severity according to maturity. It is also important to differentiate the cataract as "hot" type or "cold" type. If it is the "hot" type more than the "cold" type, the patient should take the drug *ze-shih* to suppress the hotness before surgery. Otherwise, the patient will suffer from chest tightness after the operation. If the patient has "empty heart" he will suffer from dizziness or be frightened after the operation. These patients should take *jen-shin wang*, *jin-ying gaw* or other similar medication according to the individual patient's condition.

The manifestation of cataract ranges from mild to severe, and the needles used during the operation should be adjusted according to the severity of the cataract. Generally speaking, a small needle should be used in the mature cataract, and a large needle should be used in the premature cataract. The operative day chosen should be a sunny, windless day. The operator should calm down before the operation. The location where the needle enters the eyeball should be adjusted according to the laterality of the operative eye to avoid the nose. It will be difficult to perform the operation if the operator neglected the position of the nose. Before the operation, the patient should face to the south. The operator should fix the eyeball to avoid rotation during the operation. After deciding the location to penetrate the eyeball, the needle should enter the eyeball slowly. The force should be proper. It should be applied lightly at first and become heavier after entering the eyeball. If the direction of the needle were deviated, the needle would damage intraocular tissues. If the needle damages the blood-ring, a severe hemorrhage would occur after the needle was removed from the eyeball. So it is important to

remove the needle gently. If a hemorrhage did happen, the operator should compress the wound gently, or use hot steam to heat the wound. If a hemorrhage cannot be stopped by the above methods, the operation would fail. If the patient felt pain during the operation, the procedure should be stopped until the pain has disappeared. The needle should be entered to the pupil, and in that position, the needle should touch the lens and push it gently into the vitreous cavity. After that, the operator may ask the patient whether he can see better or not. If the patient has found his vision did improve, the operator should close the patient's eye and remove the needle. After removing the needle, the patient should keep quiet for a while, and the vision will improve afterward.

After the operation, the eye should be patched for seven days. The patient should lie down in a supine position. Other people should not talk loudly around the patient. The patient should be very careful when he sits up, leaves the bed or performs any activity. The patient should not do any activity forcefully. During the postoperative month, the patient should not wash his face to avoid the dirty water contaminating the wound. The patient should avoid sexual behavior. He should avoid any irritating food. During the postoperative year, he should not eat wine-noodles. The eye patch can be removed after seven days. Although the patient can see better at that time, he will see some snow-like floating material. This symptom will improve gradually. The patient should not use his eyes too often in that period. If the patient complains of eye pain, it is a bad sign. After the postoperative fourteen days, the eye patch can be removed totally. If floaters still persist, the poorly healing wound caused it; the patient should avoid any harmful activity and leave enough time for the eye to recover during the postoperative three months.

3. GENEALOGY OF THE TWO MAJIMA SCHOOLS AND THEIR RIVALRY

The temple Iozan Yakushiji of Majima had many buildings and several groups of monks. Majima Seigan and his students worked at a temple building called Zonanbo. There was also another group known as Daichibo. The legend of the Daichibo group says that the monk Seigen Sojibo started treatment of eye diseases in the period 938-946. Later, Majima Shigetsune (? -1357) successfully treated the eye disease of a prince at the court of Emperor Go-Kashihara (reign: 1501-1526) and for this was granted the name, Daichibo. While it is difficult to believe the tenth century story of Seigen Sojibo, the genealogy of the Daichibo group has been recorded from the time of Daichibo Shigetsune in the fourteenth century to establish that they, too, treated eye diseases in a separate building called Daichibo in the same temple precincts as the building called Zonanbo.
Meanwhile, Majima at Zonanbo had excellent successors. The thirteenth generation head Enkei had success in the treatment of the eye disease of the third princess of Emperor Go-Mizunoo (reign: 1612-1629). For this, he was granted in 1632 the name *Myogen-in* (Institute to Give Light) to replace the

name Zonanbo. The twenty-first generation head Enkai treated the eye disease of the second prince of Emperor Momozono (reign: 1748-1762) also with great success, and for this the Majima at *Myogen-in* was named to the royal service. Thus, the Majima school of *Myogen-in* came to the peak of its activities. Since Majima of *Myogen-in* and Majima of Daichibo were practicing on the same temple grounds, there was a rivalry between the two schools. The rivalry developed into a competition for the leadership of the temple. In 1810, the twenty-second generation head Enkei of *Myogen-in* won the contest against the fourteenth generation head Enshu (Kaian) of Daichibo. After this, the Daichibo group had to leave the temple, and members of the school dispersed to various regions of Japan.

The Majima of *Myogen-in* flourished thereafter. The twenty-eighth generation head Ennyo went to Nagasaki, studied Dutch medicine, and expanded his repertories (see Chapter 7). Following the Meiji Restoration in 1868, the Majima family left the temple to learn modern medicine and practice as commoners. Currently, the thirty-eighth generation successor Kiyoyuki is at work as an associate professor of ophthalmology. The genealogies of *Myogen-in* Majima and Daichibo Majima are in Table 6-1 and Table 6-2, respectively.

As the result of losing the contest described above, students of the Daichibo group spread throughout the country during the Edo period and were active under the surname Majima. Students of the rival Majima *Myogen-in* eventually moved out of Nagoya and practiced as Majima eye specialists. Consequently, it is difficult to know exactly which of the Majimas in various regions of Japan belongs to which of the two former Majima schools. Nevertheless, they brought a new technique of eye care to regions of Japan where people had previously no access to advanced ophthalmology practice. Okuzawa Yasumasa has compiled data on these Majima ophthalmologists. The results are given in Table 6-3, and it gives an overall view of ophthalmology practice of the Majimas in Japan from the sixteenth through the eighteenth centuries.

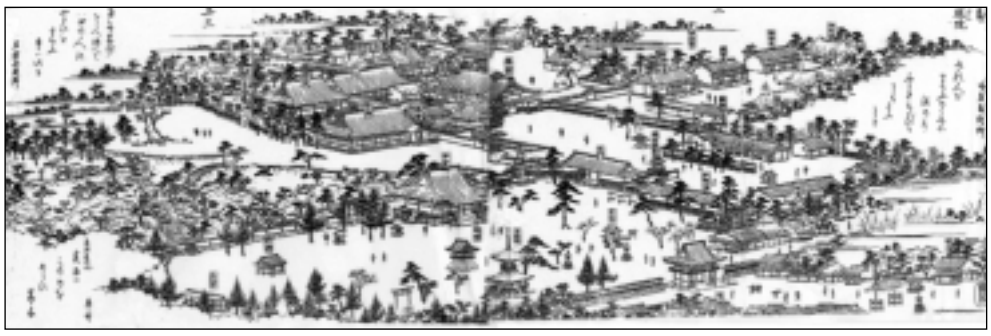


Figure 6-2: Birds' eye View of the Myogen-in (Temple and Eye Hospital) during 1840s when the Myogen-in was at its peak of activity, under 28th Head, Ennyo. There were lodgings in front of the main gate where patients stayed and waited for consultation. At the center is the main buildings of the temple and at the right are eye hospital wards: five wards for men and six wards for women. The buildings at the back were used for treatment and also at the center of the conglomerate of the buildings, there was a special house (Needle House) where cataract surgery was performed. (From Owari meisho zue (1844): Atlas of famous places in Owari, present Nagoya. Okuzawa Collections)

4. THE STRUCTURE AND ACTIVITIES OF THE *MYOGEN-IN*

Since the *Myogen-in* won the competition against the Daichibo group, the *Myogen-in* flourished through the leadership of its successive heads (Table 6-1), and many patients from remote regions came to have their eye diseases treated there. The *Myogen-in* expanded and developed to its peak around 1840. A birds-eye view of *Myogen-in* in this period appears in the book, *Owari meisho zue* (Atlas of Famous Places in Owari (Nagoya)), and Figure 6-2 is a copy of it. In front of the main gate of the temple were many inns or lodgings for traveling patients. Among the buildings within the temple complex were an operating room and a building for treatment as well as the main edifice of the temple itself. To the right of the main building complex were five wards for men and six wards for women. The record around 1869 estimated the number of hospitalized patients to be about 150. The head of Majima, the six monk-students, and the sixteen assistants worked every day. Only the head of the school performed surgery. Thus *Myogen-in* was the largest eye hospital in Japan throughout the Edo period. The large structure shown here no longer exists. There remains in the city of Nagoya a small temple that carries the name of *Myogen-in*. Two stone monuments indicate the place of famous, old Myogen-in, the inscriptions recording its imperial grant and designation as a royal service (Figure 6-3).

Figure 6-3: Monuments of Majima Myogen-in in Nagoya
Left: The monument of eye hospital by imperial order of Emperors Gomizunoo and Momozono.
Right: The monument of Majima Myogen-in Hospital.(Photo: by Majima Akio)

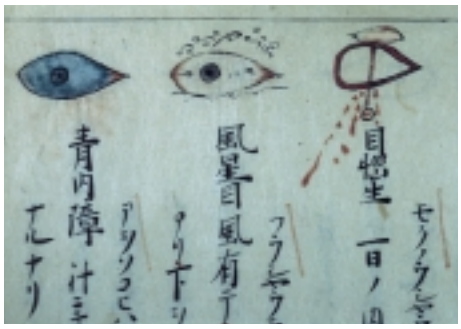
5. *HIDENSHO* (CONFIDENTIAL TEACHING TEXTS) IN THE 16TH AND 17TH CENTURIES

The Majima school kept its teaching strictly confidential. Teaching took place only through verbal transmission and tutorial training of a small number of students who had to submit a pledge that they would never transmit the teaching to others. Thus, the content of the training they received was never written down in any form, and no record of the teaching of Majima Seigan and his successors over the fourteenth and fifteenth centuries has ever been found. The earliest written record that has been preserved until today is the teaching of Majima Daichibo copied in 1514. As already described, there were two Majima schools in the sixteenth century, Zonanbo (later named *Myogen-in*) and Daichibo. The latter was more open, and as a result, we have more *hidenshos* of the sixteenth and seventeenth centuries from the Daichibo school. However, for most of the *hidensho*, it is difficult to identify which of the two schools they belong to. Nevertheless, we were able to compile one hundred and seventeen existing *hideshos* copied during this period, and these are listed in Table 6-4 with their current locations. Unfortunately, there are some books only listed in the literature but subsequently lost and no longer accessible. For example, Ogawa Kenzaburo described four hidensho, not listed in the Table, in his famous book *Kohon Nihon Gankashi* (the History of Ophthalmology in Japan) (1904), but they were not found by the current search. There are also twenty-

Figure 6-4: Sample pages of Anmoku kudensho (1570) (No.11 of Table 6-4.) This Book is the first hidensho with color atlas of the 48 eye conditions, with descriptions of symptoms and methods of treatment. (Chiba University Library)
Right: The first page of the book, depicting the red eye due to disturbance of liver. Prescriptions are given with recommendation of eye irrigation with cold water.
Left: A modified Five-ring Theory of Chinese Eye Pathology. Each part of the eye represents internal organs, i.e. lung, heart, spleen, kidney and lever.

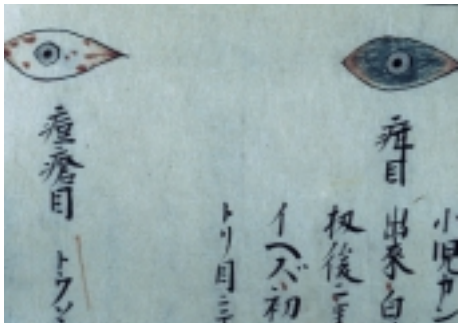
seven *hidensho* without any record of the year of copying that probably belong to the same period under discussion in this section (in Kenikai, Nakaizumi Collections).

An interesting aspect of the *hidensho* is that many have color pictures depicting the conditions of the diseased eye. The first of these color atlases is *Anmoku kundensho* (No. 11 of Table 6-4) of the Majima Seigan school copied in 1570. The first page and the picture of five-ring theory (to be discussed later) are given in Figure 6-4. This book shows color pictures for forty-eight eye diseases and describes their findings and methods of

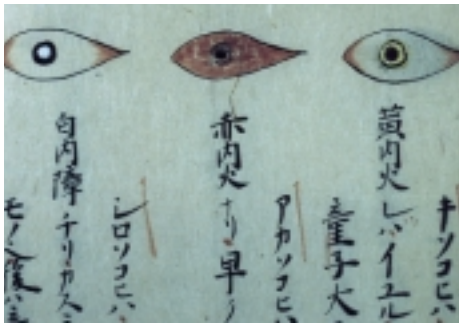


Left: Aonaisho (Glaucoma), the pupil dilates and vision blurs. The eye aches as if stubbed with needles. Finally bulbar conjunctiva also appears blue.
Middle: Fuseimoku: After having been affected by epidemics, black flower-like structure appears when one looks upward.
Right: Mokunosho: Long standing infection of organism is present and the eye is destroyed in one day.

Left: Jinshokumoku: After too much of sexual conduct, all the powers of five organs are lost.
Middle: Shitsujyakumoku: Nothing particular in the cornea, but swelling and pain are intense and hemorrhage occurs around the cornea.
Right: Tenryumoku: In the beginning skin of the eyelid itches with crust formation and then swelling occurs and very annoying. The eyeball is usually all right, but sometimes affected with loss of vision.



Left: Tosome. The eye in smallpox: when corneal opacity appears, it is very serious.
Right: Kan no me. This is seen in child; white cotton like things are seen in bulbar conjunctiva. Bulbar conjunctiva often becomes blue, then the cornea becomes opaque, When cotton like things are seen, the child can not see in the evening. (Authors' note: this is perhaps Bitot spots in Vitamin A deficiency).



Left: Hakunaisho (Cataract) Vision blurs and the pupil appears white. One uses needle to cure this condition.
Middle: Aka sokohi: All parts of the eye looks red. The condition can be cured by early removal of blood.
Right: Ki sokohi: The pupil becomes yellow. The condition can be cured by early treatment but if delayed, pupil dilates and it is difficult to cure.

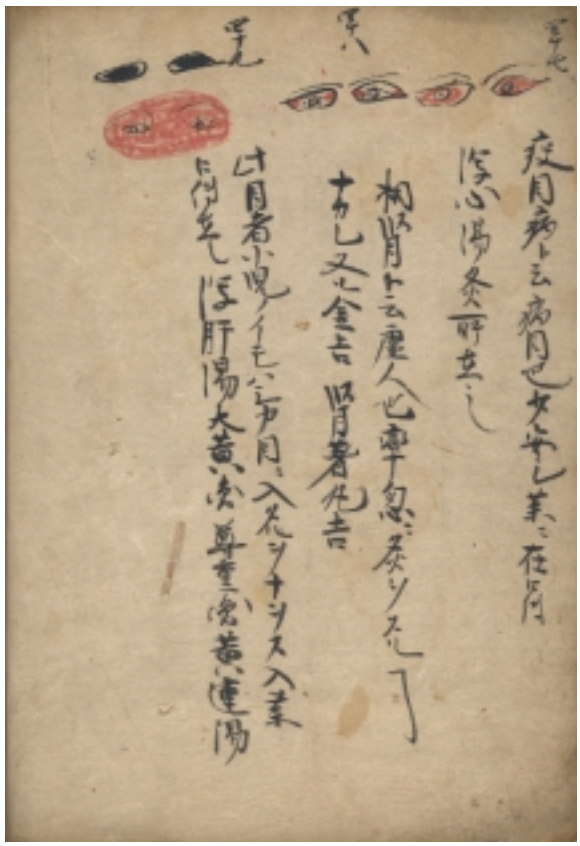
Figure 6-5: Four samples of the atlas of eye diseases from the hidensho of 1673, (Ganmoku gyokai) (No. 105 of Table 6-4). This hidensho describes 49 eye diseases with pictures and methods of treatment for each condition. Also the hidensho gives methods of drug preparation in the later part of the book. English Translation of the text is given under each Atlas (Okuzawa Collections).

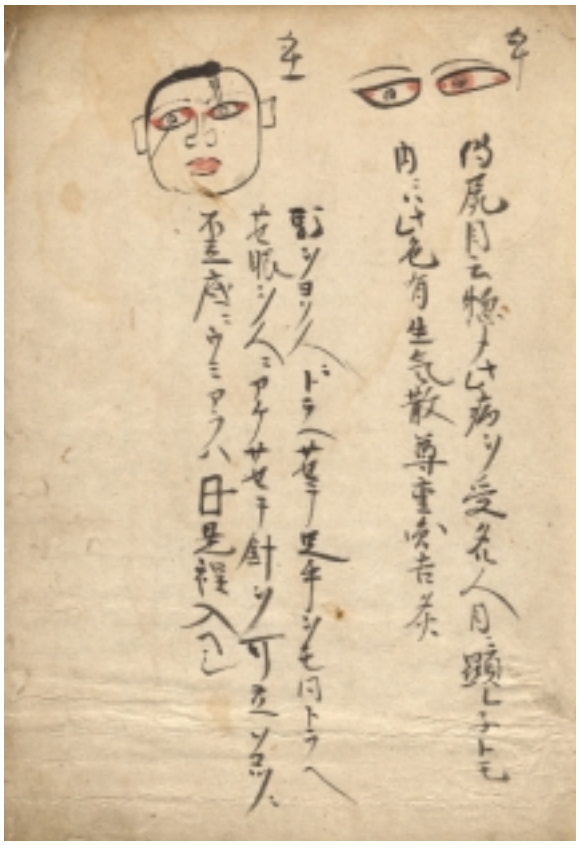
treatment. It appears that this particular *hidensho* established the basic style of the color atlas of eye diseases for the later period. It is also this book that mentions the origin of Majima Seigan's ophthalmology teaching. Another interesting point of the *hidensho* is that it presents Chinese five-ring theory in a much-modified form. This Chinese theory will be discussed in later sections.

Figure 6-5 shows color pictures taken from *Ganmoku gyokai* copied by Takugan in 1673 (No. 105 of Table 6-4). The multicolor pictures of this book are very elaborate, and the description of the findings is accurate and detailed. It is of great interest to find included a description of findings in child night blindness resembling Bitot spots, probably due to Vitamin A deficiency, almost two hundred years earlier than the discovery of this spot in Europe.

A *hidensho* with a very different approach from those of the Majima school is in the Wayenborgh collections. Two sample pages of this book are shown in Figure 6-6. It was copied in the fourth month of 1607 and does not give the name of the person who copied it (No. 48 of Table 6-4). When Mr. J. P. Wayenborgh showed us this *hidensho*, we could not immediately identify which school it belonged to. Then Okuzawa did research exploring many old documents of contemporaries and concluded that this *hidensho* likely belongs to the school of Manase Dosan.
Manase Dosan (1507-1594) was born in Kyoto and became a monk at the age of thirteen. He was twenty-two when he decided to learn medicine and became a student of Tashiro Sanki (1465-1537), who imported new medicines from Yuan China. Having completed his studies at the age of thirty-nine, Dosan came back to Kyoto where he practiced internal medicine. His professional excellence became widely recognized and supported by the Ashikaga shogun and the many powerful lords who, as retainers of the shogun, occupied large domains and had their own armies. In 1571, Dosan published an eight-volume textbook of internal medicine, *Keitekishu*, which became the most highly respected textbook of that time. His more than three thousand students extended *Dosan-ryu* (Dosan's way of practicing medicine) throughout Japan. *Keitekishu* contains ample descriptions of eye diseases or ocular symptoms, among them myopia and presbyopia, trichiasis and hordeolum. Dosan mentions many ocular symptoms in relation to diseases of the internal organs and stresses the key role of the eye in the diagnosis of various diseases. He further notes many types of drug therapy for eye diseases. The ophthalmology of Manase Dosan has not been described in previous Japanese books on the history of ophthalmology. However, this *hidensho* in Europe clearly indicates that there were students of Dosan who practiced ophthalmology and applied his drug prescriptions.

Right figure
Left: Measles in Children. The drugs to cure eye complications are by confidential verbal teaching.
Middle: Tojin: exhausted organs. Do not use Moxibustion.
Right: Epidemic eye affections, use drugs, shashin-tou.





Left Figure
Left: Cataract. Let someone to hold the head of the patient and let someone else to hold the hands and legs. Let also someone to open the eye and use needle to perforate the eye.
If there is pus, the needle can go in as indicated.

Right: So-called Shirime, It appears in the eye, as indicated, showing such color. Moxibustion may be used.

Figure 6-6: Samples pages of Manase hidensho (1607) (No. 48 of Table 6-4, Wayenborgh Collections). The hidensho depicts 61 conditions with color atlas and describes symptoms and methods of treatment. The latter half of the book gives methods of preparation of various drugs.

6. TERMINOLOGIES AND CONCEPTS OF EYE DISEASE

In the Nara and Heian eras, Chinese medical textbooks were imported and used for basic education in medicine; hence, the terminology and concepts of eye disease in use in Japan were all Chinese. When Tanba Yasuyori wrote *Ishinpo* in 984, he referred to the principal Chinese medical textbooks of the Sui and Tang dynasties; but along with the usual Chinese terminology, he also included the Japanese names for eye diseases. In the Song dynasty, ophthalmology became more elaborate than before. In the one-hundred-volume medical textbook, *Taiping Shenghui Fang* (992), Volume 32 has an extensive theory of eye pathology and a description of external eye diseases and their treatment. Volume 33 discusses *nei zhang* (internal disturbances of the eye) and classifies five colors of *nei zhang*. It also describes in detail the technique of cataract couching, the text having been copied from the ophthalmological treatise of Nagarjuna Bodhisattva as discussed above. The Chinese characters for *nei zhang* are read in Japanese as *nai sho*, which corresponds to *sokohi* (disturbances of the ocular bottom). In the *Shengji Zonglu* of the Song dynasty, completed in 1111-1117, the concept of *wai zhang* is defined to embrace external eye diseases. *Wai zhang* is read in Japanese as *gai sho*, which is equivalent to *sotohi* or *uwahi* (external eye diseases).

Kajiwara Shozen had already adopted the two concepts of the internal and external disturbances of the eye in his textbook of medicine *Ton'isho* (1304); and these concepts were further transmitted in *Gotai shinbunshu* written several decades later. Both of these fourteenth century books include many Japanese names for eye diseases, indicating the efforts of Japanese medical writers to extend usage of their own concepts, independent of Chinese terminologies. The terminologies used in *Ishinpo* and in the above two books are listed in Table 6-5.

In the *hidensho* of the sixteenth and seventeenth centuries, the number of identified eye diseases increased greatly, and the names used for them are purely Japanese. The Majima school added a new concept of *chusho* or *naka sokohi* (disturbances of the middle section of the eye) that reside between the external and internal disturbances. The names used in the *hidensho* listed in Table 6-4 are not uniform; but they have many aspects in common, which are listed in Table 6-6. We can see that some of the names were in use already in *Ishinpo* and also that many new words developed over the next two centuries. It is also noteworthy that the terminologies are by this time mostly original Japanese and that the description of the findings is of a practical nature based on actual clinical observation. Surprisingly, as noted before, the findings similar to Bitot spots in child night-blindness are clearly described in drawings almost two centuries before they were first described in Europe.

The concept of five colors in internal disturbances such as cataract appears to be of Indian origin. In *Susruta Samhita*, *Uttara-Tantram*, six colors of *linga-nasa* (cataract) are described: 1) reddish, 2) bluish-yellow, 3) white, 4)

blood color, 5) mixed color, and 6) bluish (translation by Ito Yaeji, 1971). The theory of *nei zhang* put forward in the subsequent Song text, *Taiping Shenhui Fang*, identifies five colors: 1) bluish white, 2) black, 3) yellow, 4) red and 5) blue. It is difficult to ascertain the relation between the Indian and Chinese concepts of the color of internal disturbances, but the similarities are interesting. A book by Georg Bartisch published in 1583 also describes five colors of cataract. It is of interest that similar observations of cataract existed in the sixteenth century throughout the world.

The Majima school adopted the Chinese concept of five colors of the inner disturbances and added *ishisokohi* (stone-like disturbances of the ocular bottom) and *chusho* or *naka sokohi* (disturbances of the middle section of the eye). Altogether, the Majima school defined seven *sokohi* or internal disturbances and kept its definitions and methods of treatment confidential. As we will discuss later, the terminologies listed in Table 6-6, with some alterations made by various new schools, were used throughout the subsequent Edo era.

7. SURGICAL TREATMENT IN THE *HIDENSHO*

When Majima Seigan began to treat cataract by the use of needle technique, this method of cataract couching became the central point of confidential tutorial instruction. In each of the *hidensho* listed in Table 6-4, there is a description of cataract which notes that cure is by needle, using the method verbally transmitted (*kuden*). We found two *hidensho* that show a picture of cataract surgery, but the picture is no more than a simple sketch and it is impossible to use it as a text to perform surgery.

In *Majima goncho shokyo* (1607) (No. 50 in Table 6-4), Majima Wakasanokami indicates five important teachings that were to be kept strictly confidential: 1) technique of heating needles, 2) technique of using knives, 3) technique of treating cataracts, 4) treatment and 5) diagnosis. Thus, we believe that surgical treatment of not only cataract but also of various external disturbances was performed. Unfortunately, the *hidensho* do not reveal details of the techniques that were used.

However, we did find one detailed description of the use of needle in cataract surgery in the *hidensho* called *Majima ganshitsu ho* copied in 1596 by a person unknown. The whole content of this *hidensho* is Majima Seigan's teaching, beyond any doubt (No. 32 of Table 6-4). The text of the *hidensho* reads as follows:

"When we use a needle, the patient should face the morning light from the south. The needle should be penetrated one hair diameter outside the border of the black and white eye. The direction of the needle should be straight and when it goes in about 3 mm, one can see the needle tip go across the pupil. Then tilt the needle, and when the needle reaches the other end of the pupil, move the needle and stir the pus. When the pus dissolves and appears to the

black eye and sticks to the needle, then tilt the eye and remove the needle slowly. There is hard white in a cataract and it is difficult to dissolve it by one needle; one can repeat needling three to four times. If there is bleeding by previous needling, give medication for three to seven days until the blood disappears. The interval of ten days is the best between needles. After the needle operation, the patient should be careful not to move his face and be careful also in excretion. Postoperative medication is important. When the external membrane is complicated, one should remove the membrane by the use of a heated needle, and cataract needling should be performed after the membrane has healed completely."

This *hidensho* also describes the method of sectioning of flesh growth, i.e., membrane formation over the eye, as follows: "Touch the membrane with a heated needle three times a day, then pull the membrane with a hook and give sections slowly with a knife. Great caution should be taken not to injure the black eye and watch the direction of the blade. On the second day after the heated needle, remove the membrane of the right eye from the inner canthus, on the third day from the left eye. Thus it takes 5 days to remove the membrane. Postoperative care should be for 14 days, but could be 21 days or 35 days depending on the condition."

This description of cataract needling appears to be for mature cataract, but the concept and technique of the needle surgery is very similar to what was given in Nagarjuna Bodhisattva's ophthalmological treatise. Also, sectioning the outer membrane formation with a heated needle, hook, and knife is very similar to the technique written in Nagarjuna's book. There is then no doubt that Majima Seigan's method of cataract and other surgery is based on this Indian technique brought to Japan through the writings of Nagarjuna Bodhisattva or through a similar description in the Song dynasty textbook discussed above.

8. DRUG THERAPY IN THE *HIDENSHO*

The *hidensho* not only give a picture of various eye diseases and their names, but most of them also describe methods of drug therapy for these diseases. For example, the oldest *hidensho* of Daichibo (No. 1 of Table 6-4) gives forty-two medicaments and their uses for various diseases. The medicaments are very similar to those already described in *Ishinpo* and the Chinese textbook of the Tang dynasty, *Beiji Qianjin Yaofang* by Sun Simiao, and were already imported from China (see Tables 4-1 and 4-2). Japanese commercial exchange with the Song was active throughout the Kamakura period, and Chinese medicaments were among the imported merchandise. In the late sixteenth century, Toyotomi Hideyoshi (1537-1598) encouraged trade with the Ming dynasty; so importation of such medicaments must have been continued. It is, however, beyond the authors' knowledge how many of the medicaments used by ophthalmologists of the sixteenth and seventeenth centuries were of domestic origin. The tenth century book *Honzo wamyo* describes Japanese herbs, and it is possible that many of the herbal materials used for ophthalmology were indigenous. The most well organized

description of the medicaments, methods of preparation, and methods of application is found in a *hidensho* of 1596 (No 32 of Table 6-4). The drug therapy of this *hidensho* is listed in Table 6-7. The many drugs taken orally for general treatment are omitted, and only those used for eye diseases are listed in the table. There are many variations in the uses of drugs found in the *hidensho*, and it is impossible to cover all of them. Taken together, however, the medical treatments used in the *hidensho* of this period are more or less similar, and one can obtain the overall idea of the drug therapy of this time from the table.

9. ALIMENTARY CARE FOR EYE DISEASES

The concept of alimentary care probably originates from the Tang dynasty and can be traced back to *Qianjinfang* and *Beiji Qianjin Yaofang* by Sun Simiao. Both books were imported in the Nara era and well read by Japanese practitioners ever since. The concept of alimentary care was included, for example, in the 1304 medical textbook *Ton'isho* by Kajiwara Shozen (see Chapter 5). A similar concept was also described in *Fukuden ho*, a medical textbook completed by the monk Yurin in 1362. Thus, it is possible that this concept penetrated into the people's way of life over many centuries. Suzuki Yoshitami (1909-1987), professor of ophthalmology at Chiba University, compiled from the *hidensho* two groups of foods, those recommended and those not recommended for eye diseases (Suzuki, 1943). He concluded that the type of food for alimentary care of eye diseases was similar before and during the Edo period. Okuzawa explored twenty-two *hidensho* and enumerated the two groups of foods. The number of foods is very great, and the kinds of food are diverse. There are sometimes contradictions among the *hidensho*, and it is difficult to put everything in order. Consequently, the recommended foods and the forbidden foods that appeared in the *hidensho* more than five times were compiled and are listed in Table 6-8. The table refers to the information in the *hidensho* of the late sixteenth century; the lists of recommended and forbidden foods changed frequently in the Edo era, and this probably reflects changes in the way of life of succeeding generations.

10. CHINESE MEDICINE IN THE SONG AND MING DYNASTIES AND ITS INFLUENCE ON JAPANESE OPHTHALMOLOGY

In many of the *hidensho* of the sixteenth and seventeenth centuries, the Chinese theory of five rings is described. We can therefore see the definite influence of Chinese ophthalmology on Japanese ophthalmology at the time. Since there is no written record in the fourteenth and fifteenth centuries, we

can only surmise the source of Chinese influence from the preserved *hidensho*.

Taiping Shenghui Fang (992) is a one-hundred-volume textbook of medicine edited by imperial order of the Song dynasty. In the sections on ophthalmology, Volumes 32 and 33, the authors obviously included the content of Nagarjuna Bodhisattva's ophthalmology treatise *Longshu Pusa Yanlun*, even though they do not mention the fact that they referred to the Indian treatise or even acknowledge its existence. In the beginning of Volume 33, there is an extensive discourse on eye theory, which defines five spheres: 1) wind, 2) water, 3) air, 4) flesh, and 5) blood. According to J. Kovacs and P. U. Unschuld (1998), these spheres are a direct translation of Indian mandalas. In fact, *Susruta Samhita, Uttara-Tantram* gives five mandalas: 1) *pakschma*-mandala (the ring of cilia), 2) *vartma*-mandala (eyelids), 3) *sveta*-mandala (sclera and cornea), 4) *krishna*-mandala (choroid) and 5) *drishti*-mandala (pupil). (*Susruta Samhita*, translated by Ito Yaeji, 1971). In the ophthalmology of Song China, the five spheres represent ocular spheres: 1) the wind sphere represents the black part of the eye, 2) the water sphere represents the pupil, 3) the air sphere represents the white part of the eye, 4) the flesh sphere represent the eyelids, and 5) the blood sphere represents the inner and outer canthi. The relation of the five spheres to ocular structure as seen from in front does not correspond exactly, but the general concepts are indeed similar.

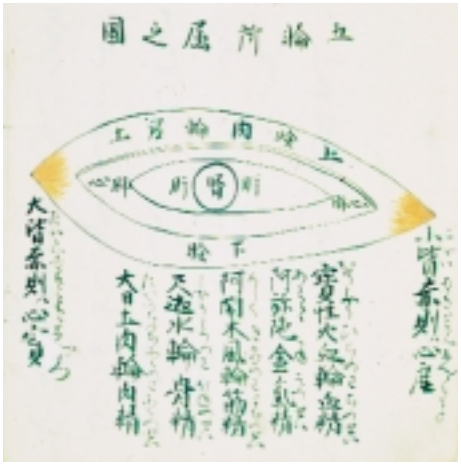


Figure 6-7: The Five-ring theory shown in hidensho No.13 of Table 6-4. This atlas resembles those that appear in Ming textbook of Ophthalmology, and has highly Buddhistic approach (Okuzawa collections)

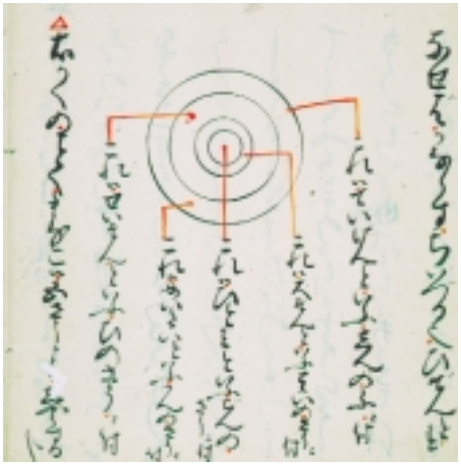


Figure 6-8: The Five-ring Theory with concentric rings that appeared in the same hidensho as in the preceding Figure. (Okuzawa collections)

In traditional Chinese medicine, it is believed that the essence of the five organs ascends to the eye and is represented by the ocular structure. Conversely, the symptoms of the eye reflect the condition of the five organs. It appears then that this classical concept and the five spheres were amalgamated to form the five ring theory of the eye. In other words, 1) the pupil represents the kidney (water sphere), 2) the black part of the eye represents the liver (wind sphere), 3) the white part of the eye represents the lung (air sphere), 4) the eyelids represent the spleen (flesh sphere), and 5) the

inner and outer canthi represent the heart (blood sphere). These concepts were drawn on a schema of the eye as seen from in front. An example taken from a *hidensho* of the mid-sixteenth century (No. 13 of Table 6-4) is illustrated in Figure 6-7. The five rings are shown in a modified form in *Anmoku kudensho* (No. 11 of Table 6-4) on the left side of Figure 6-4. A similar modified five ring is included in *hidensho* No.13 of Table 6-4, and these modified rings are illustrated in Figure 6-8.

Okuzawa Yasumasa found a twenty-volume medical handbook in his own collections entitled *Shiyi Dexiao Fang* (Medicine Useful for Clinical Practitioners), edited by Wei Yilin (1277-1347). Wei Yilin, born into a family of medical practitioners, became through diligent study an expert in many fields of medicine, especially surgery. He assembled contemporary medical knowledge, combined it with the techniques he had inherited in his family, and published his handbook in 1345. Volume 16 on ophthalmology is entitled "*longmu* theory." *Longmu* means "dragon wood." We compared this volume with Nagarjuna's treatise and with the Song dynasty text *Taiping Shenghui Fang*. The similarity of these three books is quite striking and sometimes the passages are identical. Wei Yilin's *longmu* theory was written, beyond any doubt, on the basis of the Indian treatise and the Song handbook. The name Nagarjuna was translated as Longshu in Chinese, and Longshu and *longmu* both mean exactly the same thing in the Chinese characters, "dragon wood." Although the name Longshu disappeared from the Song handbooks, we can see that the Indian name reappeared in the book edited toward the end of the Yuan dynasty. Some particular points in this *longmu* theory may be brought to attention, namely: seventy-two eye diseases are mentioned and classified, and the theory of eight enclosures appears for the first time in this book. The theory of eight enclosures is based on an old Chinese philosophy of fortune telling and had appeared previously in neither Song ophthalmology nor the Indian treatise. We feel therefore that this book by Wei is the prototype of textbooks published under the Ming dynasty.

The Yuan dynasty fell in 1368, and the Ming dynasty took over and ruled the country until 1644. The technique of printing made significant progress under the Ming, and many Chinese classic books were reprinted. Obviously many medical classics such as those mentioned in Chapter 3 were reprinted as well and imported into Japan. According to Liao (1932), Chinese ophthalmology became an independent specialty field during the Ming period when many textbooks of ophthalmology were printed. First to be printed was *Michuan Yanke Longmu Zonglun* (Confidential transmission of ophthalmology or dragon wood theory) by Bao guang in 1420 and again in 1576. This is an independent ophthalmology textbook, and it seems that "dragon wood theory" stands for ophthalmology thereafter. The content of this book is similar to that of Song ophthalmology and the theories of five rings and eight enclosures that had been expressed in poems. The classification of cataract is based on the original Indian description but is expanded in further detail. Another book *Yanke Quanshu* (The complete text of ophthalmology), published by Ai Xueyuan, was followed by *Yuanji Qiwei* (Theory of subtleties in ophthalmology) by Ni Weide. The year of publication is unknown for these two books, but the content is very similar to that of the "dragon wood theory" of Bao Guang. All three ophthalmology

textbooks describe the theories of five rings and eight enclosures, and these theories are very typical of the ophthalmology of the Ming. By far the most well organized ophthalmology textbook is *Yinhai Jingwei* (Essential Subtleties on the Silver Sea), which may have been published after the three books just discussed. Though the author of this book was said to be Tian Renqi, exact identification is not certain and it is surmised that several authors were involved. J. Kovacs and P.U. Unschuld (1998), after making an extensive investigation of this book and classic Chinese medicine, published *Yinhai Jingwei* in a complete English translation. The theories of five rings and eight enclosures as illustrated in the beginning of this book have been reproduced in Figure 6-9. The theory of five rings is identical to that described above. The theory of eight enclosures assigns eight elements to various viscera and then to various structures of the eye as seen from in front. In Chinese ophthalmology, the concept of the three-dimensional structure of the eye did not develop. Medical therapy for eye diseases was chosen on the basis of this Chinese philosophy. In *Yinhai Jingwei*, various eye diseases are depicted by simple line drawings without any use of colored pictures.

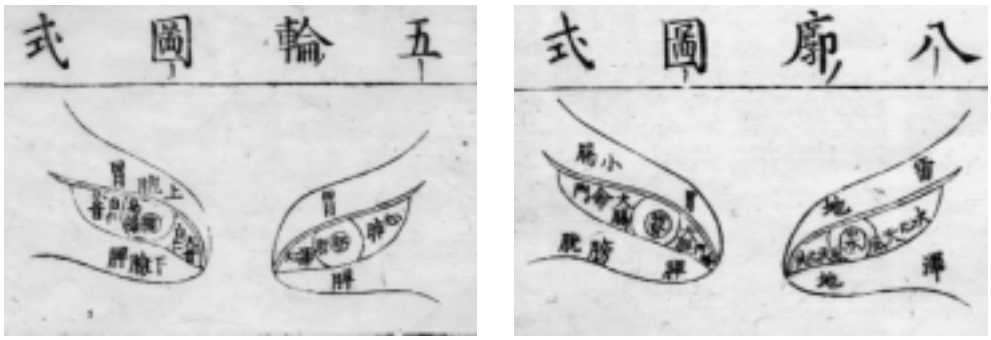


Figure 6-9: The Five-ring theory and Eight-enclosure theory in Yinhai Jingwei.
The structures of the eye seen from in front are assigned to five organs and to visceras and elements. (Kenikai, Nakaizumi Collections).

Another Ming ophthalmology textbook is *Shenshi Yaohan* (Scrutiny of the Priceless Jade Case) by Fu Renyu published in 1644. Many Japanese *hidensho* of the sixteenth century cited the theory of five rings and mentioned the seventy-two eye diseases. This indicates that Japanese *hidensho* were influenced by early Ming textbooks of ophthalmology. However, close detailed analysis of the *hidensho* reveals that Japanese ways of looking at eye diseases and treating them are different from those in Chinese ophthalmology, and they appear to have developed almost independently. Since the sixteenth century was the era of warfare in Japan, it may have been very difficult to read Ming books of ophthalmology. It is probable that this political situation helped Japanese ophthalmology develop independently.

In the succeeding Edo era, Ming ophthalmology textbooks became popular and were read throughout Japan. The books were reprinted in Japan quite often, e.g., *Yinhai Jingwei* in 1668, 1793, 1823 and 1824, and *Yanke Quanshu* in 1686, 1688 and 1791. Since these books were printed with a large circulation, many Japanese ophthalmologists were greatly influenced and some of them adopted the theory of eight enclosures. However, toward the end of the eighteenth century, the influence of these Ming texts faded away as Dutch medicine was about to become dominant.

11. Catholic Missionaries and *Nanban* (Southern Barbarian) Medicine

Nanban is a Chinese word meaning "southern barbarian" and was used by Chinese for people coming from the south. Since Portuguese and Spanish Christian missionaries came from the south, they were called by this name also in Japan. The medical technologies brought by Catholic missionaries were thus called *nanban* medicine.

The Jesuit priest Francisco Xavier landed in Japan for the first time in 1549 and tried to propagate Christian doctrine. He left Japan within two years without much success. However, many Jesuit missionaries followed in his footsteps, including Luis Frois (1532-1597), Alessandro Valignano (1539-1605), Genecchi-Soldo Organtino (1533-1609), Luis de Almeida (1525-1583), and Francisco Cabral (1533-1609). Until the seclusion policy of Japan began to take effect fifty years later, they succeeded in extending Christian doctrine, mainly in the western part of Japan. Many of the local lords or *daimyo* in Kyushu were baptized and offered their land to build *seminarios*. The missionaries not only taught poor people but also relieved their sufferings by charity at the medical service facilities or *misericordia* attached to their churches or *seminarios*. By the year 1600, the number of Christians in western Japan had increased to about 300,000. In 1582, Franciscan missionaries arrived from the Philippines. Their activities were aggressive, and the rivalry with the Jesuits that ensued gave rise to many troubles. As a result, in 1587 Toyotomi Hideyoshi ordered all Christian missionaries to leave Japan. Those who did not obey this order, mostly the Franciscans, were executed. Subsequently, a very strict suppression and elimination of Christians, irrespective of their sect, began until finally the country was closed in 1638. Details of Christian history in the period leading up to the seclusion policy are described in Chapter 1. The appearance of Portuguese and Christian missionaries in Japan was the first contact of Japan with Europe. Through this encounter over about half a century, many European cultural products were brought to Japan. These in turn stimulated Japanese cultural activity.

Most of the missionaries had no formal education in medicine, and therefore what they did in the medical field was no more than charitable relief of the poor. However, Luis de Almeida was a man who had actually studied medicine in Lisbon and held a license as a surgeon. He came to Japan as a merchant, then donated his property to the Jesuits and joined the missionary work. He built a hospital in Bungo, present-day Oita, in 1555. The hospital had two wards capable of accepting more than a hundred patients, and the hospital was expanded in 1559. Almeida treated patients with the help of twelve Japanese assistants. This was the first time European medicine was practiced in Japan (Yamanouchi Uichi). Jesuit superiors later prohibited missionaries from engaging in medical practice, and the activities of Almeida gradually came to an end. The hospital was finally razed in 1586 by military invasion. Almeida then moved to various places in Kyushu. He died in Amakusa in 1583. According to legend, he once removed a gun bullet from a high-class warrior. This story is highly probable since he was a

surgeon. However, it is not known exactly what type of medical service he rendered to the people of Oita, as no record of this hospital has been preserved. (Yamanouchi Uichi).

By the order of Valignano, Luis Frois wrote a voluminous record of Jesuit activities and of his observations of Japanese society (*Historia de Japan*, Matsuda et al. 1977). That record is a quite objective observation of Japan as seen by a European. He described how missionaries, seeking permission for their work, approached local lords or *daimyo* with many gifts that aroused their curiosity. From an ophthalmological point of view, it is interesting to note that Francisco Xavier brought the first spectacles to Japan. Many other missionaries as well brought spectacles to offer to the rulers. Unfortunately, all of these spectacles were lost during later warfare. Spectacle glasses for reading later became popular in the Edo era. The history of spectacle glasses in Japan will be described in the next chapter. Noteworthy is the first appearance of myopic glasses in Japan when the priest Francisco Cabral wore such glasses walking on the street. Common people were surprised to see a "four-eyed" padre. The concave glasses, first produced at the beginning of the sixteenth century, were available to high class Europeans by the middle of the century (Schmitz, 1995). It is quite interesting, then, that the missionaries brought with them the most advanced eyeglasses of the time. Francisco Cabral may be seen wearing his myopic spectacles on a folding screen painted by artists of the Kano School, one of three *nanban byobu* (southern barbarian folding screens) painted around 1600 that have been preserved. (Shirayama, 1990).

A major work of the Jesuits was a Japanese-Portuguese dictionary with explanations in the Portuguese language (*Vocabulario da Lingoa de Japan com a declaracao em Portugues*, Iwanami Publishing Co., 1980), originally published in 1603-4 in Nagasaki. The missionaries used the dictionary to teach the common Japanese people. From this dictionary, one can identify the Japanese words that the missionaries knew. Okuzawa Yasumasa counted 167 words concerning the eye. The words to denote eye structures are the same as those already in use over many centuries. There are twenty-three words for eye diseases, all words in common use in the sixteenth century. These are listed in Table 6-6. The most frequently mentioned word is the word for blindness. This may have been because there were many blind people and they were very important for the propagation of Christian teachings.

There are *hidensho* that have been specifically designated as *nanban* ophthalmology. Five of these are preserved in the Nakaizumi collections at the Kenikai Library; and Okuzawa identified another eight in other libraries, in addition to his own collections. Close examinations of these *nanban* ophthalmology books reveals that their content is very similar to that of the *hidensho* of Japanese ophthalmology. It appears that they show the same imported medicine and techniques from China and bear no trace of European techniques. Therefore, one can say that the *nanban* medicine brought by Christian missionaries had very little influence on the Japanese ophthalmology of this time.

The sixteenth century was a time of warfare with new weapons, and society needed surgeons capable of treating war casualties and removing bullets from wounds. In the field of surgery, *nanban* practice was superior to

traditional Japanese medicine. Alcohol was prepared by distillation technique and used for disinfection of the wound; the instrument for distillation was called *ranbiki* (Figure 9-11). Christovão Ferreira (1580-1650) was a Catholic missionary and surgeon who came to Japan in 1611. In accordance with the *bakufu* policy of eliminating Catholics from Japan, he was arrested and tortured. Unable to tolerate the ruthless torture, Ferreira abandoned the Catholic faith and became a Buddhist. Using the name Sawano Chuan, he later practiced surgery in Edo. His son-in-law Sugimoto Chukei (1608-1689) learned *nanban* surgery and was afterward employed by the *bakufu*. Another Japanese, Kurisaki Doki (1582-1665), traveled to the present-day Philippines in 1590 and studied *nanban* surgery in Luzon. On his return to Japan, he founded the Kurisaki school and taught many surgeons. One of his students, Nishi Kichibei, went to Nagasaki. There he became a major interpreter in relations with the Dutch on the island of Dejima and learned *Komo geka* (red-hair surgery). Lacking new inputs, the *nanban* schools and their descendants eventually converted to the red-hair surgery of the Dutch (see Chapter 8).

TABLE 6-1:

GENEALOGY OF MAJIMA OPHTHALMOLOGY FAMILY

(Fukushima Giichi, 1954,Uyama Yasuo, 1973)

Generation	Name	Date of Death	Note
1	Seigan Figure 6-1	1379. 3. 19	Founder of Majima Ophthalmology school
2	Seiyu	1386. 1. 12	Zonanbo
3	Yukei	1416. 10. 3	
4	Jyoen	1444. 12. 20	
5	Enkaku	1461. 10. 24	
6	Enwa	1476. 9. 3	
7	Enshyo	1483. 4. 8	
8	Ryoen	1503. 3. 5	
9	Yukei	1533. 2. 8	
10	Enjun	1558. 2. 3	
11	Gien	1580. 8. 11	
12	Tyoen	1611. 4 . 19	
13	Enkei	1651. 9. 19	granted the title *Myogen-in* (Institute to Give Light) by the Emperor Go-Mizunoo in 1632
14	Ensei	1677. 5. 20	
15	Entan	1731. 7. 7	1703: retired
16	Enyu	1731. 8. 13	1718: retired
17	Giku	1720. 6. 25	
18	Enyu	1731. 8. 13	reappointment
19	Enshyo	1762. 1. 6	
20	Engi	1767. 2. 3	1765:retired
21	Enkai	1798. 11. 14	1776:retired; Invited to Kyoto to treat the eye of Princess and Given the honor of Royal Service
22	Enkei	1813. 10. 7	Won the contest with Daichib? to be the Leader of the Temple.
23	Enjyun	1833. 5. 6	1802: retired
24	Ensetsu	1840. 12. 4	1811:retired
25	Enkan	1843. 6. 14	1817:retired,left the temple and became a commoner
26	Enkyo	1843. 6. ?	Due to financial difficulties, left the Temple
27	Entei	1864. 6. 8	Elder brother of Ennyo
28	Ennyo	1855. 3. 12	Studied Dutch Medicine in Nagasaki,invented many instruments and revived Majima School
29	Ensho	1894. 2. 8	
30	Ensai	1864. 3. 12	
31	Enin	1873. 8. 21	
32	Ensho	1894. 2. 28	Reappointment
33	Majima Noriyasu	1911. 7. 2	Medical license under new law, and practice
34	Majima Jyunkichi	1934. 3. 1	Student of Komoto Jujiro at Tokyo University
35	Majima Noriyazu	1951. 8. 8	Graduate of Aichi Medical School (present Nagoya University), Student of

36	Majima Kiyonori	1976. 7. 31	Ogawa Kenzaburo Graduate of Kanazawa Medical School, and Student of Komoto Jujiro at Tokyo University
Active members		**Year of birth**	
37	Majima Yoshinao	1928-	Graduate of Nagoya University, famous cataract surgeon and President of Fujita Health University
	Majima Akio	1931-	Younger brother, Professor Emerritus of Nagoya City University, Co-author of this book, the History of Ophthalmology in Japan
38	Majima Kiyoyuki	1959-	Son of Yoshinao Associate Professor of Ophthalmology, Fujita Health University

TABLE 6-2:

GENEALOGY OF MAJIMA DAICHIBO SCHOOL

(Fukushima Giichi,1954, Uyama Yasuo, 1973)

Legend says Monk Seigen Sojibo started treatment of eye diseases

Generation	Name	Year of Death	Note
1	Daichibo Shigetsune	1523. 3. 8	
2	Hidetsune	1622. 10. 15	
3	Takaho	1636. 2. 4	
4	Tsunenaga	?	
5	Norinaga	1662. 6. 5	
6	Yasunaga	1682. 5. 9	
7	Masanaga	1697. 9. 3	
8	Suminaga	1694. 8. 16	
9	Masamori	1722. 12. 6	
10	Yoshiakira	1748. 12. 19	
11	Yukinae	1778. 7. 20	
12	Tomotame	1790. 1. 26	
13	Ensho	1809. 5. 13	
14	Enshu?	Left Gifu and in 1808 submitted a report that he resigned from Majima Daichibo	He moved to Kyoto and practiced in the name of Majima Tenraku, and served to Emperor Ninko. He died in 1843. 6.14.

TABLE 6-3:

EYE SPECIALISTS WITH SURNAME [MAJIMA] (MAJIMA MAIN SCHOOL AND DAICHIBO SCHOOL MIXED, SOMETIMES DIFFICULT TO IDENTIFY WHICH SCHOOL THEY BELONGED TO) THROUGHOUT JAPAN IN EDO ERA.

Place of Activity	No.	Name	Active period
Nagoya	1	Majima Kogan (Daichibo Group)	1709-1720
	2	Kogan (2nd Generation) or Sekian	1720-1735
	3	Kogan (3rd Generation	-1756
	4	Kogan (4th Generation)	-1794
	5	Majima Shibataro	Grandfather of Kaian (Kyoto 4)
	6	Shinji Daichibo	?
Nagoya	7	Majima Daichibo,Majima Doki, Yamazaki Sadamasa,Tsuda Sigemichi, WatanabeAsigeo,Kusui Jikensei	*Hidensho* copied in1765
Inuyama	1	Majima Bokuun	around 1606
	2	Majima Wakasanokami	around 1606
Gifu: Gifu Majima Daichibo Genealogy	1	Majima Daichibo invited to Gifu by Oda Nobunaga	?
	2	Majima Daichibo Kenkei	?
	3	Nisshin	?
	4	Sonpo	?
	5	Gyokusen	?
	6	Soetsu	?
	7	Ryochi	?
	8	Rogen	
	9	Sonhan	?
	10	Ikan	?
		Syohan	?
	11	Moan	?
	12	Genshyu	?
	13	Genei	?
	14	Bunsho	1806-1832
	15	Seisai	-1867
	16	Koremoto	-1900
		Majima Anyoin	1679 *Hidensho* copied
Osaka	1	Majima Sekian	?
?		Majima Zuien	?
?		Majima Ryusen	?
?		Majima Zuisen	?
?		Majima Zuieki	?
?		Majima Zuitaku	?
?		Majima Jyojyubo	1663
?		Majima Ryuken	
?		Majima Ryuen	
?		Majima Ryusen	
?		Sekkei Wajo (same person as 14th Majima Head Ensei?)	
Sakamoto(present Shiga-ken	1	Majima Kenju	1739 *Hidensho* copied
Tokusima	1	Majima Shyunpei	?
?		Majima Wakasanokami Rinkatsu, Mitoya Nobumochi,Hirano Kuranokami Motonobu	? *Hidensho* copied
?		Mitoya Shinzaemon, Otake Yomonosuke, Ito Takuminosuke, Asai Rokuzaemon, Yamada Katsutaro	? *Hidensho* copied with Majima Wakasanokami
?		Majima Katsuemon, Majima Heizaemon Yoshikatsu, Toshisuwa Tadashi	1727 *Hidensho* copied
?		Majima Ryosetsu	1598 *Hidensho* copied
?		Majima Shosai	1596 *Hidensho* copied
Edo	1	Majima Sonhan : regarded as the man revived Daichibo School	-1636

	2	Majima Zuian (Seihan)	Grandson of Sonhan,1699-1719
	3	Majima Zuian (Seishyun)	1734
	4	Majima Zuihaku (Seimu)	1708-1757
	5	Zuihaku 2nd Generation (Eichyo) 1764-1792	
Edo Bakufu Ikan (Bakufu's Official Employee)	1	Majima Yuan	
	2	Majima Zuian	
	3	Majima Ansei	1698-1705
	4	Majima Zuihaku	1699-1703-1705-1707-1712-1716-1717-1725-1729-1731-1735
Kyoto	1	Majima Daichibo	1707-1712-1716-1731
	2	Majima Koan	1726
	3	Majima Ryuan	1685
	4	Majima Kaian Daichibo,13th Generation Head, moved to Kyoto after loss of Trial with Majima Main School, served by Imperial Order of Emperor Ichijo. He named as Tenraku and served to Emperor Ninko. He died in 1843. 6. 14.	1685
	5	Majima Koryo (son of Tenraku)	1809-
	6	Majima Koshu (son of Koryo)	1828-1838-1839-1843, Majima 25th Generation Head (Table 6-1) retired and moved to Kyoto, and served by Imperial Order of Emperior Ninko
Yamaguchi	1	Majima Seietsu Mitsushige, employed by Hagi-han Mori, continue to next column.	1814-1856
		3rd: Masataku Mitsushige, 4th:Hosen Mitsutomo, 5th:Seiho Mitsuyoshi, 6th:Kumajiro Mitsuyuki, 7th: Sosen, 8th Hosen Mitsuaki	1829-1874-1600-1671
Matsue	1	Majima Ganeki	
Ise	1	Majima Ryoteki	
	2	Majima Teitatsu	?
	3	Majima Genryo	?
	4	Majima Motomasu	?
	5	Majima Yokei	?
	6	Majima Nyudo Jyoan	?
		2nd: Saian, Jinyo-nyudo Kyosi ,Shuetsu,Kaneko Magotaro	?
Okazaki and around	1	Majima Ryutatsu	?
	2	Majima Shikataro	?
Aoe	1	Majima Ryoeki	
Koshyu(present Yamanashi-ken	1	Majima Tosai	
Sado	1	Majima Daisuke	?
Iida	1	Majima Kenshin	?
Sagami(present Kanagawa-ken)	1	Majima Ryozo	?
?		Majima Shyosai Nobuchika	*Hidensho* copied in 1594
?		Majima Ryou	? *Hidensho* copied
?		Majima Zuihaku Student	? *Hidensho* copied
?		Majima Shibataro	? *Hidensho* copied
?		Majima Nyudo Seian	? *Hidensho* copied
?		Majima Shyogenin	? *Hidensho* copied
?		Majima Kenjyu	? *Hidensho* copied
?		Majima Ryusen	1712, *Hidensho* copied
?		Majima Shibataro	1809, *Hidensho* copied
?		Majima Ryugan Shigechika	1800, *Hidensho* copied

TABLE 6-4:

PRINCIPAL HIDENSHO (CONFIDENTIAL TEACHING TEXT) IN THE 16-17 CENTURIES

Glossary: 1. *Hidensho :* Confidential teaching text,
2. *Ganka:* Ophthalmology, *3. Kuden:* Verbal transmittance
4: *Ryu:* School, overall teaching particular to a person,
5: *Sho:* book, 6. Ganmoku: the eye, 7: *Shokyo:* Small mirror
8: *Kaden:* Transmittance only in the family,
9: *Hiroku :* Secret text, 10: *moku,gan :* eye

	Year of Copy	Name of Hidensho	Person who copied	Note: location
1	1514	*Majima ganka hosho*	Majima Daichibo	Chiba Univ. Library
2	1532-1554	*Hakkikoku Kozen-ryu ganmoku hidensho*	unkown	Kenikai Nakaizumi Collecitons.
3	1555-1557	*Kukidono-ryu mokuden*	unkown	Kenikai Nakaizumi Collecitons.
4	1555	*Ganryo hidensho*	unkown Collecitons.	Kenikai Nakaizumi
5	1558	*Hozumi-ryu gankasho*	Karamine, Higashi Chusuke, Yoshitada	Daido Yakushitsu Bunko
6	1559	*Iozan Takataji Anjitsubo Ganmoku anmokuhisho*	unkown	Kenikai Nakaizumi Collecitons.
7	1566	*Ganka hosho*	unkown	Chiba Univ. Library
8	1968	*Majima-ryu gankahiden*	Daichibo , copied by Takaki Yoshinaka	Chiba Univ. Library
9	1568	*Majima-ryu ganmoku hidensho*	Majima Daichio	Kyoto University Library, Fujikawa collections
10	1569	*Daichibo hiden*	Nakai Kyurei	Kenikai Nakaizumi Collecitons.
11	1570	*Anmoku kudensho*	Majima Seigan's school,unique 5-ring theory and 48 disease atlas	Chiba Univ. Library . This Hidennsho discusses the origin of Majima School
12	1189?	*Ganmoku kuden no sho*	unknown	Kenikai ,Nakaizumi Collections. This Hidensho bears the year of copy as 1189, but this is doubtful, since the content appears to belong to the middle of 1500s, hence it is placed here.
13	1575	*Meigan gokui hiden (hakkikoku kozen-ryu)* Copy by Hirakana, Chinese 5- Ring theory adopted. 5 rings are asssigned to 5 Bodhisattvas, highly buddhistic approach	unkown	Okuzawa Collections
14	1576	*Ganryo tekiyo*	Sugioka (Majima) Joun	Daido Yakushitsu Bunko
15	1576	*Ganka tekiyo*	unknown	Daido Yakushitsu Bunko
16	1577	*Gansho ichiryu no hiden*	unkown	Kenikai Nakaizumi Collecitons.
17	1577	*Sanmi-hogen kaden hiho*	Shinzato Yoshiura	Daido Yakushitsu Bunko
18	1577	*Isho Ganka*	Shigetaka	Daido Yakushitsu Bunko

19	1579	*Ganmoku hidensho*	unkown	Chiba Univ. Library
20	1580	*Majiima-ryu me-soho (Majima methods of eye Treatment)*	unkonwn	Chiba Univ. Library
21	1581	*Majima goncho shokyo*	unkonwn	Chiba Univ. Library
22	1581	*Otori gan yaku densho*	unkonwn	Written in chinese, has 5-ring theory, Okuzawa Collections
23	1581	*Gosotsuki gan ryoho*	Yamaoka Gozaemon soden (Ominokuni)	Daido Yakushitsu Bunko
24	1581	*Hidenno sho*	Majimaq Daichibo	Chiba Univ. Library
25	1588	*Ganryo hiden*	Tougetsu	Kyoto Univ. Library, Fujikawa Collections
26	1589	*Kansho-ryu ganmoku hiyaku*	Keian and Bukei	Kyoto Univ. Library, Fujikawa Collections
27	1589	*Keian chigan ho*	Keian and Bukei	Kenikai Nakaizumi Collecitons.
28	1596	*Mokudensho hiho*	unkown	Kyoto Univ. Library, Fujikawa Collections
29	1596	*Mokudensho hiden*	unkown	Okuzawa Collections
30	1596	*Majimake higankasyo*	Tada Ryusei	Daido Yakushitsu Bunko
31	1596	*Majimake higankasyo (Majima-ryu Gankasho*	unkown	Daido Yakushitsu Bunko
32	1596	*Majima ganshitsu ho* (Text of Eye Disease)	unknown	Kenikai ,Nakaizumi Collections.
33	1596	*Majima ichiryu Ganka*	unknown	Kenikai ,Nakaizumi Collections.
34	1597	*Takashima-ryu hisho*	unknown	Chiba Univ. Library
35	1598	*Majima goncho shokyo*	Majima Ryoun	Kyoto Univ. Library, Fujikawa Collections
36	1598	*Ganka myokenshu*	Naoe Yshinaka	Daido Yakushitsu Bunko
37	1600	*Gykusenbo-ryu*	unknown	Juntendo Univ. Yamazaki Library
38	1600	*Gykusenbo-ryu*	unknown	Juntendo Univ. Yamazaki Library
39	1601	*Ganka hidensho*	Majima Nobuchika	Kyoto Univ. Library, Fujikawa Collections
40	1601	*Kykuso-ryu ganm oku ryochi*	Nagasaki: Ninomiya Shinzaemon, Ninomiya Kyuzaemon,	Daido Yakushitsu Bunko
41	1601	*Ryomoku hidensho*	Majima Sakyohogen	Okuzawa Collections
42	1601	*Majima ganka hidensho*	Majima Sakyo Hogen October, 17	Okuzawa Collections
43	1602	*Majima Ichiryu Yakuseiron*	Chikuan	Kyou Shooku
44	1602	*Majima goncho shokyo*	Majima Wakasanokami	Kyou Shooku
45	1604	*Majima-ryu hidensho*	unknown	Kenikai Nakaizumi Collections
46	1606	*Soro-o-ryu ganm oku no den*	Maeshima Shuzennosho	Kyou Shooku
47	1606	*Ganka daihiden hozai shinryu*	unknown	Kenikai, Nakaizumi Collections
48	1607	*Manase Dosan-ryu hidensho,* many eye diseases of aged	unkown	Wayenborgh Collections
49	1607	*Shinno ganmoku hidensho*	unkown	Kyou Shooku
50	1607	*Majima goncho shokyo, 7 naisho* (internal disturbance) described including middle disturbance	Majima Wakasa-no-kami	Kenikai, Nakaizumi Collections
51	1608	*Majima-ryu ganryo hihosho*	unknown, Majima Hiden 21 chapters	Kenikai Nakaizumi Collecctions.

52	1610	*Majima ganka hidensho*	Majima Ichimisai, July 18th	Okuzawa Collections
53	1610	*Majima-ryu ganbyo no sho*	Takata Saemontayu	Kenikai Nakaizumi Collections.
54	1610	*Majima-ryu ganyaku sho* (drugs for eye diseases)	Owari Majima Daizan Anyoji, Zonanbo	Kenikai ,Nakaizumi Collections.
55	1612	*Ganmoku-ron no koto*	Kawagoe, Hashiyoshi	Daido Yakushitsu Bunko
56	1613	*Majima goncho shokyo*	Imashige hiden	Kyou Shooku
57	1613	*Hakkikoku Kozen-ryu gaanmoku hidensho*	inherited to Maeshima Shuzen Masahide	Kenikai, Nakaizumi Collections
58	1614	*Yamaguch-ryu tekidenkyo*	Yamaguchi Dohon	Kyou Shooku
59	1614	*Gankasho Yamaguch Dohon Hijyutsu*	Yamaguchi Hakusan	Kyoto University Library, Fujikawa collections
60	1614	*Seigan iho*	unknown	Imperial Household Agency Library
61	1615	*Enami-ryu megusuri ichiryu*	unknown	Kenikai, Nakaizumi Collections
62	1615	*Shizyu-hachi-make ben goshyoku anm oku kuden*	unknown	Kenikai, Nakaizumi Collections
63	1615	*Mokuden hiryu, Keri-ryu*	Shuteizan	Okuzawa Collections
64	1615	*Ganka ryoyo ougi*	Fujiyama Koan	Daido Yakushitsu Bunko
65	1617	*Isho Ganka*	Kimura	Daido Yakushitsu Bunko
66	1621	*Shinkan Ganmoku Ryochi no hen*	Mizubayash Seibei, Takayanagi Kurodayu	Okuzawa Collections
67	1622	*Ganka kinhoden bokan hibako*	Ikkyu osho, Hirata Rikyu	Kyoto University Library, Fujikawa collections
68	1624	*Majima Seigen-ryu ganden*	Majima Seigen	Kenikai, Nakaizumi Collections
69	1625	*Ganmoku hidensho sennin-ryu*	unknown	Kenikai, Nakaizumi Collections
70	1626	*Ganmoku hidenshu*	Majima Wakasanokami	Chiba Univ. Library
71	1628	*Nanban-ryu ganmoku no sho*	unknown	Kenikai, Nakaizumi Collections, Kyoto University Library, Fujikawa collections
72	?	*Majima gansho,* detailed description of cataract couching with illustrations	unkown	Kenikai, Nakaizumi Collecions
73	1628	*Majima-ryu ganka*	unknown	Chiba Univ. Libarary
74	1629	*Ganmoku Ikka, Muso-ryu*	Dohaku, Zuido	Kyoto University Library, Fujikawa collections
75	1629	*Majima Wakasanokami Goncho Shokyo*	Seigen, Rinkatsu,Kawasumi Saburoemon	Kenikai ,Nakaizumi Collections.Ciba Univ. Library
76	1631	*Negoro-ryu ganm oku hiho*	unknown	Kenikai, Nakaizumi Collections
77	1632	*Meisho*	Hayashi Rikei	Okuzawa Collections
78	1634	*Yamaguchi Dohon nasho ichiryu*	Hoshun	Kenikai, Nakaizumi Collections
79	1636	*Naban-ryu ryochihiden*	unknown	Kenikai, Nakaizumi Collections
80	1637	*Hakkikoku soro-o-ryu ganmoku hidensho*	Sanbe Somanosuke	Daido Yakushitsu Bunko
81	1637	*Isho ganka*(5-ryu in one book)	Tanaka Chobeinojo	Daido Yakushitsu Bunko

82	1637	*Isho ganka*	Tanaka Chobeinojo	Daido Yakushitsu Bunko
83	1637	*Ganka Isshi soden no hisho (Gyokusenbo-ryu)*	Koto Choshin, Jikeikyoku	Kyoto Univ. Library, Fujikawa Collections
84	1640	*Tashiro Sanki hidensho*	Ogasawara, Tada	Okuzawa Collections
85	1642	*Aoki-ryu ganka hidensho*	Hattori Kenryu	Daido Yakushitsu Bunko
86	1642	*Ganka*	unknown	Daido Yakushitsu Bunko
87	1646	*Megusuri sho*	Shibata	Kyoto Univ. Library, Fujikawa Collections
88	1647	*Ganka hirokuden*	Tashiro Sanki, etc.	Okuzawa Collections
89	1647	*Matsuda-ryu ganmoku issaishu*	unknown	Daido Yakushitsu Bunko
90	1648	*Nanban-ryu meishu*	unknown	Kenikai, Nakaizumi Collections
91	1648	*Ganbyo no hidensho*	Kashiwagi Shunzui	Daido Yakushitsu Bunko
92	1649	*Majima ganka hiden*	Soden (1788)	Kenikai ,Nakaizumi Collections.
93	1648-1651	*Ganmoku jyodensho*	unknown	Kenikai, Nakaizumi Collections
94	1653	*Nanban-ryu ishohiden*	unknown	Kyoto Univ. Library, Fujikawa Collections
95	1654	*Bairyo sensei ganka hiroku (Keri-ryu)*	Bairyo	Kyoto Univ. Library, Fujikawa Collections
96	1654	*Chigan ho*	unknown	Kyoto Univ. Library, Fujikawa Collections
97	1662	*Muso-ryu ganhidesho*	unknown	Kyou Shooku
98	1663	*Majima goncho shokyo*	unknown	Chiba Univ. Libarary
99	1665	*Hakkikoku soro-o-ryu ganmokuden*	Murakami Kadayu	Oya Bunko
100	1666	*Nanban-ryu ganryo hiden and Majima gonchyo shokyo*	unknown	Kenikai ,Nakaizumi Collections.
101	1667	*Majima Wakasanokami Ganryo-sho*	Majima Wakasa-no-Kami	Kenikai ,Nakaizumi Collections.
102	1668	*Ganmoku hidensho*	unknown	Kenikai, Nakaizumi Collections
103	1669	*Meishu*	unknown	Kyoto Univ. Library, Fujikawa Collections
104	1673	*Ganka hikan (Rengeji Kinzanji-ryu)*	unknown	Kyoto Univ. Library, Fujikawa Collections
105	1673	*Ganmoku gyokai:* Atlas of 49 eye deseases, Excellent Atlas	Takugan	Kenikai ,Nakaizumi Collections. Daido Yakushitsu Bunko
106	1675	*Ganshu mokuroku*	Suzuki Shichibei, Yamaguchi S?kichi	Okuzawa Collections
107	1677	*Chikuozan onmuso ganka hiroku*	unknown	Kenikai, Nakaizumi Collections
108	1678	*Majima ganka kuden-sho*	Tachibana Ason Motonobu	Kenikai ,Nakaizumi Collections.
109	1680	*Unshu yakushi nyorai mokuden inka*	unknown	Kenikai, Nakaizumi Collections
110	1680	*Katsukai katsugan sei*	unknown	Kenikai, Nakaizumi Collections
111	1682	*Mokuden*	unknown	Kyou Shooku
112	1686	*Shijuhachimake no ron*	unknown	Kyou Shooku
113	1689	*Chigan tsushin*	unknown	Kenikai, Nakaizumi Collections
114	1689	*Majima ganka sho*	Nomura Genseki	Kenikai, Nakaizumi Collections
115	1689	*Majima-ryu ganka*	Kubono Zensuke, Majimain Yuan, etc.	Kenikai, Nakaizumi Collections

116	1689	*Ganmoku kadensho*	unknown	Kenikai, Nakaizumi Collections
117	1689	*Tawara-ryu Gokuhisho ganryo hiroku*	unknown	Kenikai, Nakaizumi Collections

Note: There are 27 *Hidenshos* without the date or year of copying, that probably belong to Majima School, in Keinikai, Nakaizumi Collections.
Ogawa Kenzaburo mentioned 4 *hidensho* not listed here, in his book (1904). They must have been lost unfortunately.

TABLE 6-5:

NAMES OF EYE DISEASES USED IN JAPAN SINCE 10TH CENTURY TO 14TH CENTURY

From *Ishinpo* (984), Ton'isho (1304) and *Gotai shinbunshu* (Middle to late 14th Century)

Ishinpo (984)	Names of eye diseases	Possible relations with modern disease	Note
1	*Me fumei or akirakanarazu* (The eye cannot see without obvious cause)	unknown	The diseases and their treatment are citation from Sui and Tang Medical books (see Chapter4)
2	*Seimo or Akishihi* (One can not see,even when the cornea and pupil appear all right)	Cataract	Use of needle, the first mention in Japan
3	*Torime (Sparrow Eye)*	Night blindness	
4	*Gan-hiei* (Skin like opacity over the eye, here is a strcture like fly wing, and later develops pain and growth of flesch)		
5	*Sekihaku maku* (Reddish-white membrane, acute glanulomatous growth in Conjuntiva)	Pterygium ?	
6	*Sokuniku* (Acute granulomatous growith)		
7	*Shinotsuki or Syukan* (Bundles of small vessels grow over the eye)	Pannus?	
8	*Mesyushi-wanshyutsu* (Prolaps of eyeball)	Prolaps of the eyeball	
9	*Ganshutsu* (Painful swelling of the eye)		
10	*Meaka-tsu* (Red eye with pain)		
11	*Mokutaiseki* (Redness of the eyelid)		
12	*Yotsu* (Itching and pain)		
13	*Meaka-tadare* (Red eye with errosive changes of the eyelid	Red eye with errosive changes of the eye lid	
14	*Meruishutsu* (Tearing and itching is called in China as Feng Yan)		
15	*Me o moroni tsukiyaburu* (perforation of the eyeball)	Traumatic perforation of the eye	
16	*Take ki no sashime* (trauma with bamboo stick or wood)	Intraocular foreign body, wood and bamboo stick	
17	*Ine mugi-saki irime* (trauma with bearded tips of rice or wheat)	Trauma with bearded tips of rice and wheat	
18	*Kusa-saki ishi irime* (ocular foreign bodies with sand, plants etc.)	Intraocular foreign body, sand plants, etc.	
Ton'isho (1304)			
1	*Fugan* (eqaual to Chinese Feng Yan)		
2	*Kigan* (Red eye and always pain and headache)		

3	*Meaka Niku de* (Red eye with glanulomatous growth)	Pterygium?
4	*Tadareme* (Errosive changes of the eye)	Errosive blepharitis
5	*Gaisho* (External disturbances: equal to Chinese Wai Zhang)	External disturbances
6	*Naisho* (Internal disturbances: equal to Chinse Nei Zhang)	Internal disturbances, including cataract
7	*Itching* and pain leading to memrane formation	
8	Torime or Sparrow eye	Night-blindness
9	Foreign bodies, sands and dust	Ocular foreign body

Gotai shinbunshu(edited by Seisai), probably middle to late 14th century

1	*Mekusa* (always discharge from the eye)	Ocular discharge
2	*Tadareme* (Errosive changes)	Errosive blepharitis
3	*Itame* (Painful eye)	
4	*Shiromake* (White mem brane forms over the eye)	
5	*Akamake* (Red membrane grows over the pupil)	
6	*Sokohi* (The eye looks usual, but patient can not see)(This is equal to Naisho: internal disturbances)	Internal disturbance including cataract
7	*Yamime* (There is a hole between the black and white eye and pus flows &out with pain)	
8	*Mono-morai*	Hordeolum
9	*Torime*	Nightblindness
10	*Mewata*	?
11	*Marodo-I*	Ogawa Kenzaburo thought it to be Phlyctenular keratitis?
12	*Mekusa*(Itching of eyelid with errosive changes and a great deal of discharge)	
13	*Shinotsukime*	Pannus ?

TABLE 6-6:

NAMES OF EYE DISEASES THAT APPEARED IN HIDENSHO OF THE 16TH AND 17TH CENTURIES

Glossary: 1) *Naisho=Sokohi:* Internal disturbances of the eye,
2) *Gaisho=Uwahi=Sotohi*: External disturbances of the eye ,
3) *Make=Maku:* Membranes,
4) *Chi:* Blood
5) *Hoshi:* Opacity in the cornea,
6) *Me=Moku:* the eye

Number	Name of diseases	Note and Comments, comparison with modern nomenclature
I	***Naisho(Sokohi): Internal Disturbances***	*This is equal to Chinese Nei Zhang, ie, Internal disturbance of the eye.*
I-1	1.Shiro-sokohi	Cataract
I-2	2.Ao-sokohi	Glaucoma
I-3	3.Kuro-sokohi	Amaurosis?
I-4	4.Ki-sokohi (Yellow??sokohi)	Granulomatous uveitis?
I-5	5.Aka-sokohi (Red sokohi)	Intraocular hemorrhage?
I-6	6.Ishi-sokohi (Stone sokohi)	? The pupil becomes small and color is like marron.
II	***Chusho (Naka Sokohi)***	*This classification is typical of Majima School, and embraces diseases that affect cornea and anterior segments.*
II-1	Fuji-make	Fibers and blood vessels grow and make entangled membrane
II-2	Fudoku	Fibrous membrane with swelling and pain,uable to open the eye.This occurs after higher fever.
II-3	Ho-un(Crowd of the peak)	Opacity occurs in the cornea, and a membrane with fibers appear behind it. This is also called Hou-un-make.
II-4	Hoshi	White dot appears in the cornea, sometimes many dots apppear
II-5	Hishi-make	Irresistable itching of eyelids. It often occurs post-partum women.
II-6	Tenko-gan	Acute redness and pain in the white eye.
II-7	Chyo-me	Violent fiber grows in the white eye and invades the cornea.It is painful.(Suzuki Yoshitami (1944) thought it to be keratitis fascicularis)
III	***Uwahi (or Sotohi), External disturbances***	*Uwahi means membrane formation over the eye and corresponds to Chinese Wai Zhan, ie.external disturbances.*
III-1	Shirome Chi Suji oshi	Many red vessels grow in the white eye.
III-2	Tadare-me	Errosive blepharitis
III-3	Tsukino-Wa	Opacity appeas in the peripheral cornea and expands like a half moon or ring form.
III-4	Chinomichi-me	Hemorrage in the eyelid with errosive chages and opacity covers the cornea.
III-5	Chi-maku	Bloody membrane formation over the white eye.
III-6	Kusa-make	It appears seasonally when grasses grow and dies.It itches and develop errosive blepharitis.
III-7	Mushi-make	Errosive changes are extensive in the upper and lower eyelids and inner and outer canthus, and it is very painful.
III-8	Haku-make	White membrane grows over the black eye.
III-9	Bechi-make	Membrans grow separately from the inner and outer canthi and along the upper and lowe lids. The membrane finally merge and obstruct vision
III-10	Aka-make	Red membrane grows over the black eye.
III-11	Shinotsuki	Many vessels and fibers cover the cornea, and is long standing. Pannus?
III-12	Fuji-hoshi	

III-13	*Mekusa-hira*	Erruptions grow around the cornea and covers the black eye.
III-14	*Yamime*	The eye becomes red by blood and eyelid swelling occurs with pain.White opacitices appear often on the cornea,and this is serious condition. Epidemic conjunctivitis?
III-15	*Cho-moku*	Purple fibers come from the white eye and invade the black eye,like crowds
III-16	*Mekasa*	Eruptions appear in the border of the white and black eye and painful.
III-17	*Hae-make*	Fly-like structure grows close to the cornea.
III-18	*Doniku*	Blood is filled in the white eye.
III-19	*Oniku*	Same as Doniku,but white dots enter the black eye.
III-20	*Jyoki-make*	Blue fibrous growth extensive and covers the black eye.
III-21	*Sankon-maku*	A fibrous structure with thick base grows from the inner canthus and invades the black eye.
III-22	*Mehiru*	Leech-like structure grows from the inner canthus and invades the black eye.
III-23	*Jyaku-moku (Meyowa-maku)*	The black eye is opaque and the border of the black and white eye can not be recognized.This is also called Meyowa-maku.
III-24	*Tenryu-moku*	In the beginning skin of the eyelid itches with crust formation andd then swelling occurs and very annoying. The eyeball is usuall allright, but sometimes affected with loss of vision
III-25	*Shitsujyaku-moku*	Nothing particular in the cornea, but welling and pain are intense and hemorrhage occurs around the cornea.
III-26	*Jinshoku-moku*	After too much of sexual conduct, all the powers of 5 organs are lost.
III-27	*Fusho-moku*	After having been affected by epidemics, black flower-like structure appears when one looks upward
III-28	*Mokunosho*	Long standing infection of organism is present and the eye is destroyed in one day.
III-29	*Toso-me (Mogasa-no-me)*	The eye in small pox:when corneal opacity appears it is very serious.
III-30	*Kan-no-me*	This is seen in child: white cotton-like things are seeen in the bulbar conjuntiva, which often becomes blue, and then the cornea becomes opaque. When cotton-like things are seen ,the child can not seee in the evening.(Possibly, Bitot spots and night blindness in Vitamin A deficiency)
III-31	*Hashika-no-me*	The cornea affected during measles
III-32	*Toji-make*	Thick fibrous membranes grow and close the eye. Patients are unable to open the eye, it is very painful.
III-33	*Yoei-make*	Membrane like fly wing forms on the white eye, comes close to the corea. If it invades the cornea, it is difficult to cure.
III-34	*Me-hebi*	Snake-like structure grows from the outer canthus.
III-35	*Sudare-make*	Blood vessels decend on the cornea (like a screen) and finally become thick membrane.
III-36	*Sugi-make*	Similar as above.
III-37	*Tsuri-make(Happo Tsuri-make)*	Fibrous membrane grows from outer and inner canthi and invades the cornea.In Happo Tsuri-make, similar membranes grow from various coner of the white eye and cross over the cornea.
III-38	*Me-take*	Similar to Tsuri-make
III-39	*Uki-make*	Membrane covers white and black eye and often bleeding occurs.
III-40	*Ten-make*	Similar to Sudare-make
III-41	*Me-waku*	White eye becomes red and the black eye

		protrude together, then treatment is impossible.
III-42	*Kani-me*	Fibers grow over the white eye. With heated needle, fibers can be removed step by step, use milk as eye drop.
III-43	*Kyaku-Sei(Marodo-hoshi)*	Corneal opacities appear and if it is over the pupil, it is serious.(Ogawa Kenzaburo thought it to be phlyctenular keratitis)
III-44	*Me-Tako*	Small protrusions in the eye lid or in the white eye. One can remove wirth heated needle.
III-45	*Me-hasu*	Small protrusions in the eyelid. One can remove them in the similar way as above.
IV	***Trauma***	
IV-1	*Tsuki-me*	Sticking the with sharp pointed object
IV-2	*Uchi-me*	Contusion of the eye.
IV-3	*Kizu-me*	Wounded eye with uneven surface
V	***Other disturbances***	
V-1	*Torime*	Night blindness
V-2	*Rougan*	Presbyopia
v-3	*Sakamatsuge*	Trichiasis

TABLE 6-7-1:

MAJIMA PRESCRIPTION OF DRUGS FOR LOCAL USE: 1

Note: Usually grind the ingredients to power, direct appliction possible, but they boil with water and filter it. Use filtrate.
For names of diseases, please refer to Table 6-6.
Glossary: san: powder

Name of the drug and its indication	Ingredients
1 Dai-Ryunou-san-1 This is for general use, outer disturbances, inner disturbances, fever and cold eyes.	*Dryobalanops aromatica resin*, Gipsum, Borax, Camphor Calcite, Musk, Zinkspar, Cypraeae concha, Talc, Potassium nitrate, Shell, Abalone, Cinnabar, Cattle fish bone, Cinnabar Cassia tora L.; seed, Sparrow Embryo, Trilead tetraoxide, Alminum sulfate Kudzu powder, Trichosantes powder
2 Ryunou-san-1 This is for general use, as above	*Dryobalanops aromatica resin*, Gipsum, Musk, Calcite, Talc, Borx Potassium nitrate, Zinkspar, Shell, Camphor, Cypraeae concha, Abalone, Cattle fish bone *Cassia tora L.*; seed, Shell Kudzu Powder, Trichosantes powder, Alminum sulfate
3 Ryunou-san-2 This also for general use, as above	Gypsum, *Cassia tora L.*; seed, Borx, Camphor, Musk Camphor, Calcite, Cattle fish bone, Deer horn, Oyster shell, Alminum sulfate sparrow excrements
4 Light-colored Runou-san This is for various condition, good to stop tearing	Gypsum, Camphor, Cattle fish bone, Musk, Cinnabar Potassium nitrate, Abalone
5 Hakuban-san This for flesh growth in the white eye, good for all eyes with itching	Gypsum, Alminum sulfate, Potassium nitrate , Cattle fish bone powder, Trilead tetraoxide, Musk, Borax
6 Naisho-Dairyunou-san This is for *Naisho* (Internal disturbance)	Gypsum, Shell, Cinnabar, Musk, Abalone, Newly hatched sparrow *Cassia tora L.*; seed, Camphor, Pearl, Talc, Potssium nitrate
*7 Naisho-ryunou-sa*n This is good for the beginning of *Naisho* (Internal disturbance including cataract)	Gypsum, Potassium nitrate, Shell, Camphor, Musk, Abalone Sparrow embryo Red lead oxide
8 Shinjyu-san (Pearl powder) This is good for all *gaisho* (External disturbances)	Gypsum, *Cassia tora L.*; seed, Pearl, Abalone, Shell, Skull bone, Potassium nitrate
9 Kaigan-san (Powder to open the eye) This is good for *gaisho*?with membrane formation	Gypsum, Potassium nitrate, Pearl, Skull bone, Aluminum sulfate, Cattle fish bone, Deer horn, *Dryobalanops aromatica resin*, Musk, Zinkspar, Camphor, Abalone

10 Sekkou-san This is good for ocular wound with uneven surface	Gypsum, Borax, Potssium nitrate, Newly hatched sparrow Silica, Gold foil, Musk
11 Jako-kinpaku-san (Musk-Gold foil powder) This is as above	Camphor, *Cassia tora L.*; seed, Newly hatched sparrow Silica powder, Gold foil, Musk, Borax
12 Jako-Hakutan-san This is good for *Yoei-make, Tsuri-make* and other membrane formation.	Gypsum, Shell, Cinnabar, Alminum sulfate, Japanese cinnabar Potassiun nitrate, Musk, Camphor, Deer horn, Abalone Sparrow excrements, Red clay
13 Shinkatsu-san This is the best drug for epidemic eye (*Yamime*)	Cinnabar, Kudzu powder
*14 Seino-Kobai-sa*n This is the best drug for epidemic eye (*Yamime*?	Camphor, Red plum, Boil the above with amur cork tree
15 Enshou-san This is good for *Tadareme* (Errosive blepharitis)	Gypsum, Alminum sulfate, Cattle fish bone, Potassium nitrate Indigo ?, Musk, Camphor
16 Seiryu-hakutan-san This is good for *Tadareme* (Errosive blepharitis)	Alminum sulfate Cattle fish bone, Musk, Indigo?
17 Outan-san This is good for all disease, with fever or cold	*Coptis chinensis root*, Dried giner, Musk, Gambir *Dryobalanops aromatica resin*, Potassium nitrate, Gypsum Red lead oxide
18 Meigan-suigin-san This is good for eye affection for child's *Mokasa*, Small pox)	Gypsm, Deer horn, Shell, Pearl, Mercury
19 Kohaku-san This is good for painful eyes and corneal opacities	Snake bone, Cattle fish bone, Ambar, Perl, Musk, Shell
20 Koniku-san This is good to suppress flesh growth in the white eye	*Dryobalanops aromatica resinm*, Borax, Shell, Newly hatched sparrow, Musk, Potassium nitrate
21 Chinjyu-san This is good for all *Gaisho* (External disturbances)	Zinkspar, Borax, *Dryobalanops aromatica resin*, Potassiun nitrate , Musk, Trichosantes powder, Deer horn, Oyster shell Sparrow excrements, Cinnabar
22 Meisei-san Grind to powder and cover the corneal opacities with it	Shell, Snake bone, Pearl, Musk, Abalone, Calomel

TABLE 6-7-2:

MAJIMA PRESCRIPTIONS OF EYE-DROPS, IRRIGATING SOLUTION AND ORAL DRUGS.

For names of diseases, please refer to Table 6-6

Glossary:1) *san:* powder, 2) *tou*: warm or hot water, 3) *kou:* ointment

Name of the drug and its indication	**Name of the drug and its indication**
1 Seigan-tohan-tou This is good for Chyome (violent fibrous growth invading the cornea.	*Angelica acutiloba Kitagawa*, Pear's peel, Iris, Chinese wolf berry, Coptis chinensis root
2 Seigan-oren-tou This is good for the beginning of *naisho* (Internal disturbance including Cataract)	Cloves, Peony, Chinese wolf berry, *Coptis chinensis root* Iris, Boil these 5 ingredients, with salt. Filter and use filtrate 5-6 times a day
3 Seigan-Shikin-kou This is good for *chyu-sho* (Intermediate disturbances)	Borax, *Cassia tora L.*; seed, *Frankincense, mastic,* Cloves Arsenic sulfate, Grind each ingredient and then mix Treat the following 3 ingredient similarly, Boil the mixture with a small amout of salt, Use the filtrate, 5-6 times a day Red peony, Chinese angelica, *Coptis chinensis root*
4 Touki-Ouren-tou This is good for *gaisho* (External disturbances)	*Coptis chinensis root,* Chinese angelica root, Hazel bark, Chinese anise leaves, Linocerae caulis et folium, Boil the 5 ingredients, and irrigate the eye
5 Ouren-ketsumeisi-tou This is good for *gaisho* with membrane formation	Cassia tora L.; seed, *Coptis chinensis root,* Amur cork tree Chinese anise leaves, Common plantain peony, Chinese angelica root, Rock sweet flag; root, Boil with a small amount of salt cool down and pout over the eye.
6 Ouren-obaku-tou This is good for moon ring and errosive blepharitis	Amur cork tree, Hazel bark, *Linocerae caulis et folium*
7 Irisen This is good for epidemic eyes	*Coptis chinensis root,* ,Amur cork tree, Myricae cortex Hazel bark and leaves, Chinese Anise leaves, *Cassia tora L.*; seed, Rock sweet flag; leaves, Copper coin, Moxa, Boil these 9 ingredients, and use filtrate.
8 Kyuryu-kou This is general drug for *gaisho* (External disturances)	*Coptis chinensis root, Cassia tora L.*; seed, Jinko and Sandal wood, Cloves, Pear's peel, *Linocerae caulis et folium* *lycium chinense,* Bog rush, Rock sweet flag; root, Chinese anise leaves, *Phellodendri cortex*, Amur cork tree, Old coins Moxa, common plantain (Plantago asiatica L.), Grind and mix the above ingredients, Add the followings, Musk, Gypsum, Cattle fish bone, Camphor, Snake bone, Mix well and dissolve in water when istill to the eye.
9 Gokin-kou This is good for *Mekasa, gaisho*	Camphor, Cinnabar, *Acorus gramineus root* , Grind and mix with castor oil
10 Shinjyu-san This is good for Sticking wound, *Shinotsuki, Mekasa,* and other *gaisho*?	Pearl, Calcite, Talc, *Cypraeae concha,* Camphor, Musk

11 Gaisho-san This is good for *Uwahi* (External Membrane formation, Sticking the eye and ocular contusion.	Talk, Snake bone, Deer horn, Cattle fish bone, Oyster shell, Newly hatched sparrow, Shell, Skull bone, Perl, Grind the ingredients and mix as fine power
12 Shikin-san This is good for *Gaisho*	Gypsum, Japanese snake gourd: root, *Artemisia princeps*; stalk Potassium nitrate, White clay, Trilead tetraoxide, Japanese cinnabar, *Cypraeae concha,* Mercury sulfate, Grind the ingredients and mix as small powder
13 Myojyo-san This is good for *Hoshime* (Corneal opacities)	Shell, Snake bone, Abalone, Pearl, Calomlel and Mercury sulfate, Musk, Grind well to fine powder and mix
14 Seigan-kou Good for all External Eye diseases.	*Dryobalanops aromatica resin,* Musk, Skull bone, Shell Camphor, Scouring rush, Alminum sulfate Borax Trilead tetraoxide, Grind the ingredients and mix in honey
15 Meigan-kou This is good for External eye diseases	*Coptis chinensis,root, Berberis thunbergii DC (Megi)*, Amur cork tree, Peony, Boil the above with 500ml water, then add, Calcite, Borax, Gypsum, Camphor, Musk, Tiger Gall bladder and bile, Potassium nitrate, Then grind and mix well
16 Seki-yaku	Camphor, Pearl, Zinkspar, Cinnabar, Gypsum, Potassium nitrate, Musk, Grind the ingredients and mix in honey
17 Kinshi-kou	Zinkspar, *Cypraeae concha*, Perl, Clove, Camphor, Calcite Potassiu nitrate, Grind well andmix in honey
18 Gaisho-yaku Good for *gaisho*	Scouring rusch, Skull bone, Zinkspar, Borax, Talc, Potassiun nitrate, Grind to fine powder and mix
19 Gaisho-kake-yaku Good for *gaisho*	Zinkspar, Talc, *Coptis chinenssis rootAngelica dahurica;root* Chinse anise leaves, Old coin , Calomel, Boil the first two, and dry, then drind to fine powder
20 Meisei-san Good for *Kannome?*(xerosis conjintiva) and small pox	Amur cork tree, Jinko and Sandal wood, Moxa, Calomel Grind to fine powder with head and brain of crucian carp, then solve in oil.
The irrigation solutions.	
21 Ketsumeisi-tou Good for red eye,swollen and errosive eyes.	*Cassia tora L.;* seed, Amur cork tree, Peony, *Chinese angelica root*, *Licium barbarum L.fruit, Coptis chinensis,root* Licorce, Boil the above, and use filtrate
22 Senyaku?? irrigating solution)	*Vitex rotundifolia et trifolia:seed,* Schisandra chinensis *Coptis chinensis, root,* The same as above
23 Hakutan-san Good for eyes with flesh growth and Leech	Gypsum, Alminum sulfate, Potassium nitrate, *Cypraeae concha* Borax, Grind the above to fine power.

24 Hiryu-san Good as above	Camphor, Borax, Calcite, Alminum sulfate, Cloves Grind the above to fine powder
The drugs for oral intake	
25 Haidoku-san Good for eyes with membrane, corneal opacities and tearing.	Sichuan lovage, rhizome, Scouring ruch, *Ledebouriella divericata; root, Angelia dahurica;root, Dodder,Cuscuta jap.,* Rhubarb root, Dianthi herba, Peony, *Notopterygium incisum;*root, Chinese angelica root, Licorice, Boil the above and give.
26 Koso-san Good for flesch growth and painful eyes	Beafsteak Plant, *Notopterygium incisum;?rhizome, Pepermint Asarum heterotropoides; root,* Chinese bell or baloon flower Sichuan lovage, Ground ivy, Angelia dahurica; root, Licorice Roast the above and give
27 Ninjin-haidoku-san Roast the above, good for *Fugan*	*Bupleurum chinense DC, Platycodon grandiflorum DC* Ginseng, *Ligsticum chuanxiong Hort, Poria cocos Wolf Poncirus trifoliata Rafin., Peucedanum praeruptorum root Notopterygium incisum; rhizome*, Angelica Pubescens;root Licorce
28 Seigan-san Good for *fugan* with red swelling	Chinese angelica root, Ledebouriella divaricata; root Cape jasmine, Sichuan Lovage;rhizome, Licorice, Peppermint Rhubarb;root, *Notopterygium incisum; rhizome*
29 Hakkai-san Good for *kyohan: Jindhokumoku*	Ginseng, Chinese root, Citrus reticulata peel *Atractylodes macrocephala,* Magnolia bark, LicoricePogostemi herba, Pinella tuber, Roast with ginger
30 Daiho-tou Good for Kyoga of aged.	Ginseng, *Ligusticum chuanxiong Hort, Rhemannia glutinosa, var. Makino;root, Poria cocos Wolf, Atractylodes Macrocephala; rhizome, Angelica acutiloba Kitagaawa, Astragalus, embranaceus, White peony,* Roast with ginger
31 Ninjin-jio-tou This is good for *naisho* (Internal disturbances including cataract)	*Ligusticum chuanxiong Hort, Cimcifuga rhizome, Angelica acutiloba Kitagaawa,* Peony, Jinseng, *Kudzu root, Rhemanina glutosa, var.Makino; root, Use after roasting.*
32 Hakukei-tou Good for *Torime* (night blindness)	*Notopterygium incisum, rhizome, Angelia Pubescens;root* Chrysanthemum flower, *Atractylodes lancea; rhizome* Hakukei ?, *Cassia tora L.; seed, Boil and give extract*

Note: In addition to the above, 20 prescriptions for oral intake are given in this *hidensho*. They consist mostly of herbs and for general diseases. Also 5 prescriptions for children are given.

TABLE 6-8:

ALIMENTARY CARE IN *HIDESHO* IN THE 16-17TH CENTURIES
(Okuzawa Yasumasa)

1. Foods not recommended for eye care

Mustard	Sear bream	Noodles	Sake(Spirits)
Greasy food	Marron	Octopus	
Fungi	Ginger	Garlic	Fern shoots
Soba nooodle	Fresh-water fish	Meckerel	
Potato	Japanese pepper	Tofu (Bean curd)	Whale meat
Egg plant	Knotgrass	Ayu (Sweetfish)	
Bamboo shoots	Yellowtail	Sardine	Plum
Prawn	Seaweeds	Cucumber	
Konnyaku	Vinegar	Squid	Pheasant Leek
Wild boar	Roasted food		

2. Foods recommended for eye care

Abalone	Radish	Dried green Vegitables	Horse meckeral
Burdock	Beans	Dried sardine	
Dried Persimmon	Sear bream	Saury-pike	Butterbur
Dried bonito	Flathead	Melon	
Carp	Potata stalks	Nut bearing torreya	Sesami
Sea eel	Pickles	Plum	
Japanese peppers	Egg plant	Marron	Flying fish
Leak	Shell fish	Halibut	