

## Prescription Written at the Time of the Han Dynasty\*\*

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### Medical Formulary

Chinese physicians recorded prescriptions which had given the desired effects when used for treatment of patients in medical formularies called *fang-shu* 方書. Physicians of the following period prepared medicines based on these prescriptions but often in a modified form to make them more effective. They also recorded these improved prescriptions in their formularies and thus a great number of prescriptions accumulated in the literature of Chinese traditional medicine.

Medical formularies were the accumulation of knowledge on medical treatment in their day. According to *Han-shu*<sup>1)</sup> 漢書, eleven *fang-shu* existed at the end of the Former Han 前漢 dynasty. However, they were all completely lost without even a small part being quoted in any document. From the end of the Later Han 後漢 dynasty to the beginning of the Tang 唐 dynasty, many formularies were compiled<sup>2)</sup>. They were also lost except for *Shang-han-lun* 傷寒論, *Chou-hou-fang* 肘後方 and part of some formularies such as *Fan-wang-fang* 范汪方 and *Hsiao-p'in-fang* 小品方 which were incorporated into *Wai-t'ai-pi-yao-fang* 外台秘要方 by Wang T'ao 王燾 in 752 and into *Ishinpo* 醫心方 by Tanba Yasuyori 丹波康瀨 in 984. *Shang-han-lun* is generally considered to be the most ancient formulary remaining at present, and is thought to have been compiled by Chang Chung-ching 張仲景 at the end of the Later Han dynasty. However, the name *Shang-han-lun* was not recorded until Wang T'ao quoted part of it in *Wai-t'ai-pi-yao-fang*. Prescriptions in the present *Shang-han-lun*, which was revised as an authentic tome during the Sung 宋 dynasty, differ greatly from those incorporat-

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ed into *Wai-t'ai-pi-yao-fang* and are almost identical to part of *Ch'ien-chin-i-fang* 千金翼方. Therefore it is uncertain whether the present *Shang-han-lun* is the original. *Chou-hou-fang*, a collection of brief prescriptions, was compiled by Ko Hung 葛洪 at the beginning of the fourth century. It was supplemented by T'ao Hung-ching 陶弘景 and Yang Yung-tao 楊用道 in the years 500 and 1144, respectively, and thus which prescriptions came from the original formulary is not clear.

The traditional Chinese prescription is usually composed of several crude drugs. As the number of constituent drugs generally increased with time, the prescriptions are thought to have developed from simple ones like those recorded in *Chou-hou-fang* or those of folk medicines. Most of the prescriptions in *Shang-han-lun* and *Fan-wang-fang* require more than two drugs and are considered to be highly developed and complicated.

Prescriptions in *Shang-han-lun* and formularies written during the T'sin 晉 dynasty and thereafter have a fixed form. They usually have names like *ma-huang t'ang* 麻黃湯 and *an-chung san* 安中散. Names or indications are described at the beginning of the prescriptions, followed by the names and quantities of drugs, preparation procedures, and the method of taking the medicine and sometimes contraindications.

## **Materia Medica**

Although books called *pen-ts'ao* 本草 were not recorded in the *I-wen-chih* 藝文志 (book list) of *Han-shu*, they are considered to have been in existence at the end of the Former Han dynasty as they are mentioned in Vol. 12 *P'ing-ti chi* 平帝紀, Vol. 25 *Chiao-ssu chih* 郊祀志 and Vol. 92 *Lou-hu ch'uan* 樓護傳 of *Han-shu*<sup>3)</sup>. Because they were repeatedly being copied by hand, errors increasingly accumulated. Development of medical treatment and advancement of medical knowledge caused the addition of some drugs to *pen-ts'aos* and the deletion of others. This resulted in the co-existence of many books with identical names and very different contents, and stimulated T'ao Hung-chin to compile them into a standard book, *Shen-nung-pen-ts'ao-ching-chi-chu* 神農本草經集注 (the so-called *Chi-chu-pen-ts'ao* 集注本草). This was a com-

bination of *Ming-i-pieh-lu* 名醫別錄 with *Shen-nung-pen-ts'ao* 神農本草 and was supplemented with his knowledge about the drugs as notes. This book was later regarded as an authentic materia medica and used for the education of specialists and standardization of drugs. *Pen-ts'aos* were revised repeatedly, with accurate preservation of the contents of the predecessor and addition of only new drugs and knowledge until the Sung dynasty. The contents of *Chi-chu-pen-ts'ao* seem to have been well retained in later *pen-ts'aos* such as *Ta-kuang-pen-ts'ao* 大觀本草 and *Cheng-ho-pen-ts'ao* 政和本草, which were completed at the end of the Northern Sung dynasty and remain today in intact forms. The earlier *pen-ts'aos* were outdated by the appearance of their successor and disappeared.

Emphasis is placed on the medical use of each drug in *pen-ts'aos*, but names, characters, preparation methods, habitats, harvest times and other information are also included. T'ao also mentioned in his preface to *Chi-chu-pen-ts'ao* that excellent physicians in the past prepared medicines based on the uses of the drugs described in *pen-ts'aos*. However, it is very difficult to understand how the prescriptions in *Shang-han-lun* were made from the descriptions in *Shen-nung-pen-ts'ao* and *Min-i-pieh-lu*, although these books are presumed to have been contemporary. Consequently, the medical uses of the drugs given in *pen-ts'aos* are sometimes not thought important.

### **The Han Documents: Yü-men-kuan and Edsin-Gol Prescriptions**

Early in this century, two documents written on wood or bamboo strips were unearthed in the northwestern region of China. One was found by Sir Aurel Stein in 1906 to 1908 at Khotan 于闐, Niya 尼雅 and Tuen-huang 燉煌 district and taken to England. This was arranged by E. Chavannes. Later Luo Chen-yü 羅振玉 and Wang Kuo-wei 王國維 received photographs of the documents from him, classified them and published the results of their study as *Liu-sha-chuei-chien* 流沙墜簡. The document is estimated to have been written during the period between the Later Han and Former Liang 前涼 dynasties.

Medical prescriptions were also found on eleven bamboo strips excavated near Yü-men-kuan 玉門關 and estimated to have been written at the time of the Han dynasty<sup>4</sup>. These strips were severely damaged and remain only as short fragments. As indications and/or drugs are missing, it is difficult to establish the original form of the document. Indications are written on six strips. One is the beginning part of an indication, three others are short and the other two are long ones described in detail. Names of drugs are seen on four strips. They are *jen-shen* 人參, *tsu-wan* 茈菀, *ch'uang-p'u* 菖蒲, *hsi-hsin* 細辛, *chiang* 薑, *kuai* 桂, *shu-chiao* 蜀椒, *wu-huei* 烏喙, *tsao-chia* 皂莢, *fu-tzu* 附子, *yuan-chih* 遠志, *chieh-keng* 桔梗, *ta-huang* 大黃, *shih-nan-ts'ao* 石南草 and *t'ing-mo* 亭磨. The thirteen drugs other than last two appear in *Shen-nung-pen-ts'ao*, although *wu-huei* is listed as *wu-t'ou* 烏頭. *T'ing-mo* probably corresponds to *t'ing-li* 葶藶 in *pen-ts'aos*. Two prescriptions are composed of eight or more drugs. The medicines were to be administered as pills, pastes, decoctions or powders. Pastes were prepared by boiling powdered drugs with fat and applied externally. Two prescriptions are named *tien-huei-chun-fang* 典惠君方 and *ts'ao-hsia-ning-fang* 漕孝寧方; *Tien-huei-chun* and *Ts'ao-hsia-ning* seem to be the names of the persons who first used the prescriptions. These eleven prescriptions probably are part of one or more formularies and are estimated to be fairly developed ones.

Another document written on over ten thousand strips was first excavated by F. Bergman, a member of the Sino-Swedish Expedition in 1930 at Edsin-Gol. It was studied by Lao Kan 勞幹 and published as Documents of the Han Dynasty on Wooden Strips from Edsin-Gol 居延漢簡. The document, which is chiefly composed of periodical official reports on occupation forces, contains several records on the course or treatment of diseases and injuries of soldiers together with registers of names and records of food, pay and other items. *Ch'ang-p'i* 腸澼, seen only in *pen-ts'aos* and *Huang-ti-nei-ching-su-wen* 黃帝內經素問 (so-called *Nei-ching*), is also recorded with other diseases. Although various kinds of medicines such as pills, decoctions and powders are recorded, the names of drugs do not appear other than on three short fragments and a strip carrying an intact prescription<sup>5</sup>. The prescrip-

tion is for *shang-han* and requires four powdered drugs, *wu-huei*, *hsi-hsin*, *shu* 朮 and *kuei*. Patients are directed to take one dose of the powder mixture, the amount measured with the tip of a knife-shaped coin *ch'i-tao* 齋刀, three times during the day and twice during the night with warm water. Although the *ssu-wu* of *shang-han-ssu-wu* 傷寒四物 written at the beginning of the prescription may indicate the total number of drugs, it may also be the abbreviated name of the prescription *shang-han-ssu-wu san* 傷寒四物散 as seen with most later prescriptions.

These prescriptions suggest that highly developed ones were already available at that time but are not enough to grasp an entire view of medicine during the Han dynasty.

### Ma-wang-tui Prescriptions

A formulary written on silk was found in 1973 in the Han Tomb No. 3 at *Ma-wang-tui* 馬王堆, Chang-sha, Hu-nan Prov. together with *Lao-tzu* 老子, *Chan-kuo-ts'e* 戰國策, four medical documents and others. The formulary is estimated to have been written in the Ch'in dynasty or the beginning of the Former Han dynasty<sup>6)</sup>. Because the silk was folded tightly and had decayed over the ages, the excavated document was severely damaged. Furthermore, many characters, which had become obsolete or illegible due to damage, are scattered in the fragmentary remaining parts. Thus, the document is incomprehensible. It was arranged by a Study Group for the Han Silk Manuscript from *Ma-wang-tui* and reported briefly in *Wen Wu* 文物<sup>6)</sup>, and is now being studied by a Research Group for New Materials for the Study of Chinese Science, The Research Institute for Humanistic Studies, Kyōto University.

The document seems to have been for medical practice and is composed chiefly of medical prescriptions. A small part is about symptoms and supposed causes of the diseases, but medical theories have not been found. The prescriptions are classified into groups according to the disorder. The number of groups is listed as 52 at the beginning of the formulary, but only 47 remain. Each group includes one

to 27 prescriptions. The names of the indicated diseases are written at the beginning of the first prescription of each group and sometimes followed by a short description of the symptoms and/or causes. The succeeding prescriptions can be distinguished from the preceding ones as they start on the next line with a letter *i* — at the top of the line.

About half of the names of the disorders are used differently or not seen in later formularies. Differences are found among the descriptions contained in the Han documents. *Chieh* 痲, which is on line 144 and seems to fit a description in *Shuo-wen* 說文<sup>7)</sup> of tertian malaria, is used occasionally as *chieh-yao* 痲瘧 in *Nei-ching*<sup>8)</sup>, which Wang Ping 王冰 regarded as a condition of a patient attacked by malaria and where *chieh* is an adjective in the sense of “long duration” or “emaciated”. *Lung* 瘰, which also appears in the *Wu-wei* prescriptions 武威醫簡, will be discussed later. According to *Shou-wen*<sup>9)</sup>, *ch'ih* 癩 is an infantile disease and also called *ch'ih-tsung* 癩瘰, The latter name appears in *Nei-ching*<sup>10)</sup> and considered to be tetanus<sup>11)</sup>. However, *ch'ih* is probably convulsions resulting from dyspepsia, because the present formulary states that the faces of patients are dyspeptic and green-colored. *T'uei* 積 is considered to mean “balhead” in *Shuo-wen*<sup>12)</sup>, while it is thought to be “hernia” in *Shih-ming*<sup>3)</sup> 釋名. As *t'uei* is written as *ch'ang-kuei* 腸積, probably a synonym of *ch'ang-t'uei* 腸癩, in the contents, the disease of the *Ma-wang-tui* formulary should be considered as hernia. *Yung* 癰 later meant swellings on the body surface including carbuncles and abscesses. However, *yung* in this formulary represents nonpurulent swellings as in *Shuo-wen*<sup>14)</sup>. *Hsiu* 癩 usually means lacquer and has never been known as a name of a disease. The description of *hsiu* in this formulary seems to indicate a dermatitis caused by lacquer. *Suo-ching* 索瘰 and *shang-ching* 傷瘰 do not appear in any literature but seem to be tetanus from the symptoms described. Some other diseases such as *ch'ao-che* 巢者, *hsi-hsia* 夕下 and *mo-che* 脉者 remain completely unknown. Because visible injuries appear more frequently in the formulary than other disorders, the compiler seems to have concentrated mainly on surgical disorders.

The formulary contains various kinds of medicines as summarized

Table I. Uses of *Ma-wang-tui* Prescriptions

Use	Number
External application	128
Internal use	
Powder	20
Decoction	19
Others	13
Magic formula	35
Moxibustic treatment	6
Surgical treatment	4
Unknown	55

in Table I. Due to the poor conditions of the document, the uses of about 55 prescriptions remain unknown. Because descriptions not seen in other documents are used frequently and the formulary is fragmentary, its translation into present-day language is very difficult and the original forms of most prescriptions remain unclear. The number of words which constitute a prescription differs greatly from one to another. Prescriptions in the formulary seem to have no fixed form and are fairly primitive. As repeatedly mentioned in *Huai-nan-tzu* 淮南子<sup>15)</sup>, *Lu-shih-ch'uen-ch'iu* 吕氏春秋<sup>16)</sup>, *Shih-chi* 史記<sup>17)</sup> and other documents, the number of magic formulas suggests that patients were treated frequently with spells or prayers besides medicines or surgical operation. The prescriptions are not named and require less than eight drugs, mostly one to three.

As listed in *Wen Wu*<sup>18)</sup>, about 240 drugs appear in the formulary. Although some such as *kan-ts'ao* 甘草, *pan-hsia* 半夏 and *shao-yao* 芍藥 appear in *Shen-nung-pen-ts'ao* or *Min-i-pieh-lu*, about three-quarters are not recorded in *pen-ts'aos*. The eight drugs listed in Table II appear in *pen-ts'aos* under other names. Bean and red bean are called *shu* 菽 and *ta* 荅, respectively, as in *Shuo-wen*. *Ch'üan* 荃 remains unclear though it appears in *Shuo-wen*.<sup>19)</sup> *T'ing-mo* correspond to *t'ing-li* as in *Liu-sha-chueichien*.

Powdered medicines were prepared by a method called *yeh* 冶. The letter *yeh* usually means to melt and temper metals. It is frequently seen in the Han prescriptions, but not in later medical documents, except a prescription transcribed from *Chi-yen-fang* 集驗方 into *Ishinpo* 醫心方<sup>20)</sup>. Taki Motoyasu 多紀元簡 states that this is supposed

Table II. Drugs Recorded in *Pen-ts'ao*s under Other Names

Names in <i>Ma-wang-tui</i> Prescriptions		Names in <i>Pen-ts'ao</i> s	
<i>Wu-huei</i>	烏喙	<i>Wu-t'ou</i>	烏頭
<i>Lei-shih</i>	雷矢	<i>Lei-wan</i>	雷丸
<i>Lung-hsü</i>	龍須	<i>Shih-lung-ch'ü</i>	石龍錫
<i>Ju-lu</i>	茹蘆	<i>Ch'ien-ken</i>	茜根
<i>Chu'uichu</i>	屈居	<i>Lu-ju</i>	藺茹
<i>Pai-ch'ai</i>	白苳	<i>Pai-chih</i>	白莊
<i>Lang-ya</i>	狼牙	<i>Ya-tzu</i>	牙子
<i>Pien-fu</i>	蝙蝠	<i>Fu-i</i>	伏翼

to mean to crush drugs finely<sup>20</sup>). Balances or spoons were not yet used to measure dosages. The powders were taken up with the tips of three fingers. When more was needed, enough was taken up to fill the space up to the first joints of the three fingers. Some drugs, such as hair, feathers and antlers were burned to ashes before use. The medicines were usually taken three times a day, the powders mostly with liquor. Decoctions were prepared by boiling the drugs in water or liquor. Urine was also used to boil *k'uei chung* 葵種 (hollyhock seeds) and prepare a medicine for urinary disorders. Noteworthy is the fact that continuous boiling of the decoction until the volume of the solvent was reduced from 5 to 3 *sheng* 升 is used to prepare two decoctions. This method is still used today as the only way to regulate the time of warming when preparing a decoction. Neither pastes for internal use nor pills appear in the formulary.

Decoctions were used for external application besides internal use. They were poured on diseased areas. Sometimes injured legs were immersed in decoctions. Extracts were applied to injured areas alone or mixed with fat. However, *kao* 膏 was used only to mean "fat". The medicines prepared from extracts and fat were not yet called *kao*. Although moxibustion and acupuncture are recorded in the formulary, the names of *yü-hsüeh* 俞穴 are not.

*Ling* 令, *ch'ang-shih* 嘗試, *i-yung* 已用, *shan* 善 or *chin* 精 is written at the end of some prescriptions. As pointed out in Wen Wu<sup>18</sup>), these words, may indicate that the prescriptions were once used and proved to be effective. The most important prescriptions are probably



those with *ling*, which was written after a large dot. Wang Ch'ung 王充<sup>21)</sup> early in the Later Han dynasty said that people do not immediately take up medicines prepared according to prescriptions written on bamboo strip or silk if they know neither their names nor origins, but immediately copy and carefully keep ones which include the names of the devisers or words such as *i-yen* 已驗 (effective) and *ch'ang-shih* (proved). Prescriptions of the former description were not known to people of later periods, fitting his description.

### **Wu-wei Prescriptions**

The *Wu-wei* document is a collection of formularies written on about ninety wood strips found in the Han Tomb at *Han-t'an-p'o* 旱灘坡, *Wu-wei* 武威, Kansu Prov. The fragmentary strips suggest that the original document was composed of many more strips. They are full of medical descriptions, fairly well preserved and estimated to have been written at the beginning of the Later Han dynasty. The contents differ from those of the *Ma-wang-tui* formulary. The *Wu-wei* document is composed of forty-three prescriptions, three acupunctural techniques, one physical treatment, one document related to controindications, one price list or record of drug purchases and one item which is supposed to be a magic formula. About half of the prescriptions are for internal diseases, the ratio of surgical disorders being much lower than in the *Ma-wang-tui* formulary. When two prescriptions were written on one strip, the second was distinguished from the first by a dot between the two.

The prescriptions were arranged by members of the Museum of Kansu Prov. and Cultural Center of Wu-wei<sup>22)</sup>. They were translated into Japanese after discussions at the meeting of the Research Group for New Materials for the Study of Chinese Science, Kyoto University<sup>23)</sup>.

Incisions and blank areas in the middle and near both ends of the wood strips suggest that they were bound together by three strings like those excavated at Edsin-Gol. However as the strings were lost, the order of the strips is not clear. They can be separated into three

groups, according to width<sup>22)</sup>: A, strips No. 3-41, 1 cm wide; B, No. 42-78, 0.5 cm wide; C, No. 79-92, width unfixed. Letters are written in a single file on one surface in groups A and B, but in over two files on both surfaces in group C. Although no prescriptions are duplicated within a group, except for one written on both surfaces of strip No. 88 of group C., three were found duplicated between different groups. A prescription on strips No. 3 to 5 is identical with that on strip No. 79. A description seen on No. 14 coincides with the latter half of a prescription on No. 50 and 51. A prescription written on the last quarter of No. 14 and the first half of No. 15 is almost identical with that on No. 54. Therefore, it would be natural to regard these groups as three different formularies<sup>23)</sup>.

The prescriptions were written according to a fixed form. Indications, names and quantities of drugs, preparation and administration methods of medicines, notes and other information were written in that order. Names or symptoms of indicated disorders were written between two letters at the beginning of the prescription, *ch'ih* 治 (treat) and *fang* 方 (prescription). Letters such as *liang* 良 (good), *chin* 禁 (forbidden) and *wu-ch'uan* 勿傳 (Don't give to others!) were written at the end of some prescriptions. *Chin* was almost analogous to *wu-ch'uan* and meant that this excellent prescription should be kept secret. The prescriptions were not named except for three in group C called *kung-suen-chün-fang* 公孫君方, *chien-wei-keng-chiang-chün-fang* 建威耿將軍方 and *lù-kung-chün-fang* 呂功君方. *Kun-suen-chün*, *Chien-wei-keng-cian-chün* and *Lü-kung-chün* are probably names of the inventors of the prescriptions.

The name of the diseases indicated in the prescriptions are seen in *Nei-ching*, *pen-ts'ao* or other medical literature except two, *lu-shih-ching* 魯氏青 and *chung-ling* 中令. However, some are not used in later prescriptions. The disease *lung* found in *Nei-ching*<sup>24)</sup>, *Shen-nung-pen-ts'ao* and *Min-i-pieh-lu* is considered to be urinary retention. However, as the description in *Nei-ching* is too brief to understand in detail, it is sometimes explained differently<sup>25)</sup>. The descriptions recorded in *Ma-wang-tui* and *Wu-wei* prescriptions first suggested that *lung* is a generic name of urinary disorders including nephrolithiasis, hematuria and chyluria, which were named *shih-lung* 石瘝, *hsieh-lung* 血瘝 and *kan-lung*

Table III. Use of *Wu-wei* Prescriptions

Use	Number
Internal disease	15
Surgical disorder	10
Nasal disease	2
Ophthalmic pain	1
Women's disease	1
Others or unknown	13

涓瘡, respectively. The letter *lung* was later resplaced by *lin* 淋. *Fu-liang* 伏梁 is a disease recorded in *Nei-ching*<sup>26)</sup> as an abdominal abscess. Later Tsao Yuan-fung 巢元方<sup>27)</sup> redefined it otherwise. The description of *fu-liang* in the *Wu-wei* prescription is identical with that in *Nei-ching* and differs from that in *Chu-ping-yüan-hou-lun* 諸病源候論.

As summarized in Table III, the prescriptions were intended for various kinds of diseases. The proportions of the diseases of each field do not markedly differ among the three groups. As three prescriptions for wounds were uninterruptedly written on two strips (No. 14 and 15), those used for similar injuries seem to have been written together.

The drugs were crushed by the *yeh* or *fu-chü* 攪咀 methods. The *yeh* method was employed to prepare drugs which had to be finely powdered to be taken as powders or for use as materials for pills. Pills were prepared by mixing powdered drugs with honey. In the prescription on strip No. 16, powders of *ts'eng-ching* 曾青 and *jung-yen* 戎塩 were suspended in milk and applied to the eyes. About half of the powdered drugs were taken together with liquor and others with vinegar, thin gruel, soup made of fermented beans or other liquids. The doses were mostly measured with square-shaped spoons, *fang-ts'uen-pi* 方寸匕. Some prescriptions designate use of the tips of *ch'i-taos* instead of spoons. *Fu-chü* is a method for crushing drugs more roughly to the size of soybeans.<sup>28)</sup> Roughly crushed drugs were used for the preparation of decoctions by boiling in water, liquor or vinegar. One of the decoctions was for internal use and one for direct application to the wounded area. Decoctions were also used to prepare pastes for internal and external use. Crushed drugs *lu-ju* 蘆茹 and *pa-*

*tou* 巴豆 were covered with cloth to make plugs and inserted into the nose to remove polyps. The number of drugs in a prescription varied from one to fifteen.

The number of drugs in the formulary is about 100. Although most of their names are the same as those in *Shen-nung-pen-ts'ao* or *Min-pieh-lu*, some have names different from those in *pen-ts'aos*. As in the *Ma-wang-tui* prescriptions, *wu-huei* and *pai-ch'ai* are used instead of *wu-t'ou* and *paichih*, respectively. *Pan-mou* 斑耗 and *t'uo-wu* 囊吾 are also used in *pen-ts'aos* as *pan-mao* 斑猫 and *k'uan-tung-hua* 款冬花, respectively.

Acupunctural descriptions list the names of two *yü-hsüehs*, *san-li* 三里 and *fei-yu* 肺俞. Their locations described in the formulary coincide almost perfectly with those in present textbooks for acupuncture. As the fragmentary strip No. 27 carries the word *ch'üan-shuei* 泉水, which is estimated to be a name of *yü-hsüeh* but does not appear later, the original formulary may have contained many more names of *yü-hsüehs*.

### Use of Drugs in the Han Prescriptions

The drugs constituting the *Wu-wei* prescriptions seem to have been combined based on the medical indications given in *pen-ts'aos*. For example, an eye lotion on strip No. 16 for the treatment of ophthalmalgia consists of two drugs, *ts'eng-ching* and *jung-yen*. As ophthalmalgia is listed as treatable by both drugs in *Shen-nung-pen-ts'ao*, they are believed to have been blended for reinforced efficacy. A powder used to treat *lung* is composed of six drugs, three of which, *chu-mai* 瞿麥, *t'u-ssu-shin* 兔糸實, *hua-shih* 滑石, are listed for *lung* or stuttering urination. As summarized in Table IV, 16 of the 18 prescriptions which give indications and names of drugs almost all contain one or more of the drugs which had been listed for the given diseases in *Shen-nung-pen-ts'ao* or *Min-i-pieh-lu*. *Pen-ts'aos* were probably used to determine the drugs suitable for treatment of diseases at the beginning of the Later Han dynasty, when the *Wu-wei* prescriptions were written.

In one of the *Yü-men-kuan* prescriptions intended for chronic severe cough is composed of eight drugs, *jen-shen*, *tzu-wan*, *ch'ang-p'u*, *hsi-hsin*,

Table IV. Number of Drugs Used According to the Indication  
in *Pen-ts' aos*

Strip No.	No. of drugs constituting the prescription	Drugs used according to <i>pen-ts' ao</i>
3-5	6	6
6-7	6	5
9-10	6	3
13	2	0
14	1	0
16	2	2
44-45	3	1
46-47	7	5
50-51	5	4
52-53	4	2
80	10*	5
81	2	2
82	7	5
84	6*	4
85	15**	11
87	4	2
87	1	1
87	1	1

\* One drug was illegible due to damage of the strip.

\*\* Three drugs were illegible due to damage of the strip.

*chiang*, *kuai*, *shu-chiao* and *wu-huei*. The seven drugs other than *jen-shen* are indicated for *k'ai-ni* 欬逆, *k'ai-ni-shang-ch'i* 欬逆上氣 or *k'ai-sou* 欬嗽 in *pen-ts' aos*. The only prescription in the Edsin-Gol document for *shang-han* is composed of four drugs, *wu-huei*, *hsi-hsin*, *shu* and *kuai*. *Pen-ts' aos* indicate *wu-huei* for *chung-feng* 中風, *e-feng* 惡風, and *shu* for *feng-han* 風寒. These drugs, other than *kuai*, are included in one (No. 6-7 stripes) of the *Wu-wei* prescriptions for the treatment of *shang-han*. On the other hand, the use of drugs in the *Ma-wang-tui* formulary does not seem to have been completely based on *pen-ts' aos*. For example, although sixteen prescriptions for *lung* are composed of drugs recorded in *pen-ts' aos*, only nine contain at least one drug indicated there for the disease.

## Development of Prescriptions during the Han Dynasty

The four Han documents are believed to have been written for different purposes. Because the *Ma-wang-tui* formulary was found together with many instruments, pictures and documents of various kinds, it is considered to have been one of the valuables preserved by a noble family at Chang-sha. Therefore, the formulary was probably not used by the man who was buried in Tomb No. 3 at Ma-wang-tui and how much it was used in practice at that time is somewhat questionable. On the contrary, documents other than the formularies were not found in the Han Tomb at Wu-wei. The man buried in the tomb is believed to have been an old physician<sup>22)</sup>, who used the formularies in his daily treatment of disease. Words such as *liang*, *chin* and *wu-ch'uan* in the document support this assumption. Although the character of the *Yü-men-kuan* prescriptions is obscure, the Edsin-Gol prescription is probably a report on the contents of a medicine given to soldiers suffering from *shang-han*. Thus, it would be unreasonable to compare the four formularies directly. However, some resemblance not seen in later prescriptions does exist between them.

In the *Ma-wang-tui* prescriptions, the forms seem to have not yet been fixed. Forms of prescriptions in the *Yü-men-kuan* and Edsin-Gol documents resemble those of the *Wu-wei* prescriptions. They have fixed forms similar to those written later, but are less elaborate. The Han prescriptions are not named except for two in the *Yü-men-kuan* and three in the *Wu-wei* documents. These five probably were named after their inventors, not according to their indicated diseases or constituent drugs, unlike those written later.

*Yeh*, a method of preparing powdered drugs, is found in three of four documents and assumed to have been widely utilized during the Han dynasty. In later formularies, drugs were powdered mostly by the *tao* 搗 method. Although why *yeh* suddenly disappeared from the formularies is unknown, this may have been partly due to a change in the forms of the medicines. Many in the *Wu-wei* formularies were taken as powders, which seem to have been used more during the Han

dynasty than later, although the *Ma-wang-tui* formulary contains few powders. The peculiar ratio of dosage forms in the *Ma-wang-tui* formulary could have been due to the formulary being intended chiefly for treatment of surgical disorders. Later as the number of decoctions increased, preparation of powdered medicines by the *yeh* method would have decreased. Furthermore, development of the technique and apparatus called *tao-shai* 擣篩 (pound and sort out) in later prescriptions contributed considerably to making *yeh* obsolete. Some of the powdered medicines in *Ch'en-chin-yao-fang* 千金要方 are to be prepared according the *ch'ih-hsiu-shai* 治下篩 procedure. The incomprehensible letter *ch'ih* 治 seems to be a transcription error of the letter *yeh* 冶 which occurred when the formularies were copied by hand. The original prescriptions were probably ancient ones formulated when sieves began to be used for refining powdered medicines. The transcription error was not likely to be noticed, because the *yeh* method had been completely replaced by the *tao* one and forgotten.

Regulation of the dose of powdered medicines was developed during about the year 200. Doses, which had been measured with the tips of three fingers at the beginning of the Former Han dynasty, came to be measured with the *fang-ts'uen-pi* or tip of the *ch'i-taos* at the beginning of the Later Han dynasty.

Decoction became the dosage form most frequently used later in Chinese medicines. As *Shang-han-lun* medicines were almost exclusively prepared by this method, most Later Han medicines are considered to have been decoctions. However, medicines in the *Wu-wei* formularies are mostly powders, the number of decoctions being very few. Although many decoctions are in the *Ma-wang-tui* formulary, they seem to differ from the later ones and resemble beverages. They were mostly prepared by boiling drugs commonly used as food, such as beans, plums, scallions and hollyhocks, in water or liquor. Decoctions like those used today appeared after the *Ma-wang-tui* formulary was written and developed during the Han dynasty.

The names of some drugs seem to be different, at least before the beginning of the Later Han dynasty, from those recorded in *pen-ts'aos*. The drug *wu-huei* which is rarely seen in later prescriptions is found

in all four documents. It is under another name of aconit tuber, *wu-t'ou*, in *Shen-nung-pen-ts'ao*. *Wu-t'on* is not in any of the Han formularies, although other drugs originating from aconit, *fu-tzu* 附子 and *t'ien-hsiung* 天雄 are found. On the other hand, the use of *wu-huei* in the formularies does not differ from that recorded in *pen-ts'aos*. *Wu-huei* may be the name of *wu-t'ou* of the Han dynasty. The description of intoxication by *wu-huei* in *Ma-wang-tui* formulary also supports the above assumption. The drug came to be called *wu-t'ou* perhaps after the middle of the Later Han dynasty. Also, *pai-ch'ai* which is another name for *pai-chi* in *Shennung-pen-ts'ao*, is found in *Ma-wang-tui* and *Wu-wei* prescriptions. The fact that many more drugs with different names are found in the *Ma-wang-tui* formulary than the *Wu-wei* formularies suggests that drug names changed during the Han dynasty.

The disease *ch'ang-p'i* appears in the *Wu-wei* formulary, Edsin-Gol document, *Nei-ching*, *Shen-nung-pen-ts'ao* and *Min-i-pieh-lu*, but not in later medical documents. It was widely used during the Han dynasty but later replaced by other names. *Lung* was also replaced by *lin*. The former appears in *Shen-nung-pen-ts'ao* and *Min-i-pieh-lu* mixed with the latter, but not in *Chu-ping-yuan-hou-lun* or later prescriptions. *Lin* was used for another disease in *Nei-ching*<sup>24</sup>. Confusion of the diseases *lung* and *lin* probably occurred after the *Wu-wei* formularies and *Nei-ching* were written. The names and uses of drugs and names of diseases suggest that the *Wu-wei* formularies were compiled a little earlier than *Shen-nung pen-ts'ao* and *Min-i-pieh-lu*.

Spells which are numerous in the *Ma-wang-tui* formulary are not found in the *Wu-wei* formularies except for one questionable description (No. 92). Treatment of diseases by prayers was probably used at the beginning of the Later Han dynasty. However, the physicians who used to offer prayers at the time of the *Ma-wang-tui* formulary gradually began to devote themselves to the treatment of disease.

The four medical documents suggest that medical knowledge was highly developed during the Han dynasty. However direct connections do not seem to exist among them. The relationship between these and later formularies also remains unclear.



## Significance of the Han Prescriptions in Chinese Medical History

The four Han medical documents not only partially clarify the early development of Chinese medicine, but also suggest to need to reassess the common theory about medical classics being transformed considerably by repeated revisions over a long time. The prescriptions are particularly valuable, because they remain unchanged.

Sun Ssu-miao 孫思邈<sup>29)</sup> reported that physicians living south of the Yang-tsu River kept an excellent formulary written by Chang Chung-ching secret and let nobody see it. Words such as *chin* and *wu-ch'uan* in the *Wu-wei* formularies suggest that some prescriptions or formularies were kept secret and not recorded in annals as Sun has stated.

The *Ma-wang-tui* formulary shows that treatment of diseases by physicians and prayers or shamans were not completely separated at the beginning of the Former Han dynasty. However, most of the spells recorded in the formulary are very difficult and their connection with later ones remain unclear.

Since *Huang-lan* 皇覽 was compiled during the Wei 魏 dynasty, many *lei-shus* 類書 (encyclopedias) were published personally or officially in the period of Six Dynasties (3rd-6th centuries). T'ao Hung-ching, who was a famous taoist and a scholar in various fields such as taoism, literature, geography and medicine, seems to have attempted to compile a private encyclopedia. He classified abstracts from past documents and his accumulated experiences in his memorandum into separate volumes, taking care not to overlap information about the same field in different volumes. Thus he incorporated knowledge about drugs, medical treatments and lores of the immortals into *Shen-nung-pen-ts'ao-ching-chi-chu*, *Hsiao-yen-fang* 効驗方 and *Chen-kao* 眞誥 as notes or additions, respectively. This resulted in emphasis on the character of drugs in his *pen-ts'ao* and elimination of unreasonable methods such as rejuvenation or immortalization from his *pen-ts'ao*, making in more scientific than former ones<sup>30)</sup>. Later *pen-ts'aos* were used more as standards for measuring drugs, but the Han descriptions show that *pen-ts'aos* such as *Shen-nung-pen-ts'ao* were used practically as references for

selecting appropriate drugs to treat diseases.

On the other hand, the coincidence in medical uses of drugs in *Shen-nung-pen-ts'ao* and *Wu-wei* formularies suggests that these two documents were contemporary. As medical knowledge developed continuously, medical uses of the drugs changed. This is also seen between the *Ma-wang-tui* and *Wu-wei* formularies. The former contains many more drugs used differently from the indications of *Shen-nung-pen-ts'ao* than the latter. The composition of prescriptions also changed with the times. As mentioned above, drugs having the same or similar indications seem to have been combined to make more efficacious prescriptions during the Later Han dynasty. Later, other drugs having different indications in *pen-ts'aos* were also included in the prescriptions perhaps to widen the range of the indicated diseases or modify the speed and increase the safety of the medicines. For example, T'ao<sup>31</sup> quoted from *Shen-nung-pen-ts'ao* into his preface to *Chi-chu-pen-ts'ao* that every drug in a prescription plays a role likened to *chun* 君 (ruler), *ch'en* 臣 (minister), *tsuo* 佐 (assistant) and *shih* 使 (emissary) and works with the others for a good effect. Desirable combinations are one *chun*, two *ch'ens* three *tsuos* and five *shih*s or one *chun*, three *ch'ens* and nine *tsuos* or *shih*s. Although neither the meaning of the ranks nor whether the prescriptions faithfully followed this principle is clear, this demonstrates one attempt to develop a principle for concocting prescriptions. The number of drugs used for diseases other than those in *Shen-nung-pen-ts'ao* generally increased from when the *pen-ts'ao* was compiled. Two prescriptions *pei-mu t'ang* 貝母湯 for *k'ai-ni* and *yeh-kan-mahung t'ang* 射干麻黃湯 for *k'ai* and *shangch'i* quoted from *Hsia-p'in-fang* in *Wai-t'ai-pi-yao-fang* consist of seven and nine drugs, respectively. All drugs in the two prescriptions are indicated for *k'ai-ni*, *K'ai-ni-shang-ch'i*, *k'ai-sou-shang-ch'i*, *k'ai-sou* or *k'ai-sou-shang-ch'i* in *Shen-nung-pen-ts'ao* or *Min-i-pieh-lu*, except for *ta-tsao* 大棗. Another prescription for treatment of *ching-ch'uang* 金瘡 (incision) and suppression of pain quoted from *Fan-wang-fang* in *Wai-t'ai-pi-yao-fang* consists of seven drugs. Six drugs other than *pai-chi* were indicated for *chin-ch'uang* or *chih-t'ung* 止痛 (suppress pain) in *Shen-nung-pen-ts'ao*. Because these prescriptions were entirely based on *Shen-nung-pen-ts'ao*, they are estimated to

have been written not later than when the *pen-ts'ao* was compiled.

On the contrary, the prescriptions of *Shang-han-lun* are very difficult to understand based on the indications of the drugs in *Shen-ning-pen-ts'ao*, because symptoms described in the formulary are mostly not recorded in *pen-ts'aos*. Furthermore, prescriptions in the formulary were named in various ways: *ma-huang t'ang* was named after one of its four constituent drugs, *ma-huang-hsing-jen-kan-ts'ao-shih-kao t'ang* 麻黃杏仁甘草石膏湯 after the names of all the constituent drugs, *t'iao-w'eich'eng-ch'i t'ang* 調胃承氣湯 for the curative effect of the prescription, and *pai-hu t'ang* 白虎湯 after the name of one of the four gods guarding China at its cardinal points. Although prescriptions named in various ways are also found in *Fang-wang-fang*, it seems unlikely that prescriptions which were rarely named after their inventors at the beginning of the Later Han dynasty would be named in such various ways at the end of the same dynasty. Thus, the present *Shang-han-lun* probably was compiled much later than *Fan-wang-fang* and other formularies written early in the period of Six Dynasties by collecting highly developed prescriptions from several formularies, although the original *Shang-han-lun*, which probably differed greatly from the present one, may have existed at the end of the Later Han dynasty.

It is generally accepted that the original *Nei-ching* existed at the end of the Former Han dynasty, because it is mentioned in *Han-shu* as *Huang-ti-nei-ching*. Some descriptions in *Wu-wei* formularies match those in *Nei-ching*. *San-li*, a name of a *yü-hsüeh* also appears in *Nei-ching*. One (No. 19 strip) of the *Wu-wei* prescriptions states that the needle is to be withdrawn after the patient has breathed out forty to fifty times. This probably comes from the following description in *Nei-ching*: that needles have to be inserted when patients breathe in, —begin to be pulled when patients breathe out and be withdrawn at the end of exhalation. The usage of the two words *chih* 知 (get better) and *i* 已 (recover completely) to indicate the degree of the effect of the treatment (No. 30 strip) is also recorded in *Nei-ching*. The diseases *lung*, *ch'ang-p'i* and *fu-liang* appear in both documents and do not contradict each other. However, another description<sup>32)</sup> in *Nei-ching*, which does not agree with *fu-liang* in *Wu-wei*, was probably writ-

ten in a different age. Although it is not known whether the descriptions in the *Wu-wei* formulaties were directly quoted from *Nei-ching*, this suggests that *Nei-ching* was a well known book and widely used at that time. On the other hand, the fact that many descriptions not recorded in *Nei-ching* are seen in the *Ma-wang-tui* formulary suggests, as pointed out by Chung and Ling<sup>13)</sup> that the former had not yet been compiled at the beginning of the Former Han dynasty.

### References and Notes

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- 6) Wen Wu, No. 9, p. 35 (1975).
- 7) *Shuo-wen-chieh-tzu* (*Shuo-wen*) 說文解字, Vol. 7, 痲, 二日一發瘧 (*Chieh* is a malarial disease characterized by chills and fevers recurring every other day).
- 8) *Nei-ching*, Chap. 3, *Shieng-ch'i-t'ung-t'ien-lun* 生氣通天論.
- 9) *Shuo-wen*, Vol. 7, 癩, 小兒癩癧病也 (*Ch'ih* means the infantile disease *ch'ih tsung*).
- 10) *Nei-ching*, Chap. 16, *Chien-yao-chung-chung-lun* 診要經終論.
- 11) Tü, Yün-hsiu 余雲岫, *Ku-tai-chi-ping-ming-hou-shu-i* 古代疾病名候疏義, p. 115 (1953).
- 12) *Shuo-wen*, Vol. 8, 鬚, 禿兒 (*T'uei* means bald looking).

- 13) *Shih-ming*, Vol. 8, 陰腫曰隤 (Swelling of scrotum is called *t'uei*).
- 14) *Shuo-wen*, Vol 8, 癰, 腫也 (*Yung* means swelling).
- 15) *Huai-nan-tzu*, Vol. 16, *Shuo-shan-hsün*, 說山訓; 病者寢席, 醫之用針石, 巫之用藉藉, 所救均也 (Both needles used by physicians and cereals or sedges as an offering used by shamans are equally effective for the treatment of patients).
- 16) *Lü-shih-ch'uen-ch'iu*, Vol. 3, *Chi-ch'uen-chi* 季春紀; 今世上卜筮禱祠, 故疾病愈來 (Vulgar persons in the present time always make their diseases worse, because they divine their conditions and pray for their recovery).
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- 25) *Shuo-wen* Vol. 8.
- 26) *Nei-ching*, Chap. 40, *Fu-chung-lun* 腹中論.
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### List of Drug in Text

chiang	ginger rhizome ( <i>Zingiber officinale</i> L.)
chieh-keng	root of <i>Platycodon grandiflorum</i> A.DC.
ch'ien-ken	root of <i>Rubia cordifolia</i> L.
ch'uang-p'u	rhizome of <i>Acorus gramineus</i> Soland.
chü-mai	aerial parts of <i>Dianthus superbus</i> L.
fu-i	bat ( <i>Myotis daubentoni</i> Leinsel and other spp.)
fu-tzu	tuber of poisonous aconit spp. such as <i>Aconitum carmichaelii</i> Desboux
hsi-hsin	root of <i>Asarum sieboldi</i> Miq.

hua-shih	halloysite
jen-shen	root of <i>Panax ginseng</i> C.A. Meyer
jung-yen	crude salt brought from salt lakes at north-western China
kan-ts'ao	liquorice root( <i>Glycyrrhiza glabra</i> L. var. <i>glandiflora</i> Regel et Herder)
kuei	cinnamon bark ( <i>Cinnamomum sieboldii</i> Meisn.)
k'uan-tung-hua	flower of <i>Tussilago farfara</i> L.
k'uei	<i>Malva verticillata</i> L.
lei-wan	sclerotium of a fungus <i>Omphalia lapidescens</i> Schroeter
lü-ju	not identified
pa-tou	seed of <i>Groton tiglium</i> L.
pai-chih	root of <i>Angelica dahurica</i> var. <i>pai-chi</i> Kimura, Hata et Yen
pan-mao	<i>Mylabris chichorii</i> L. and other <i>Mylabris</i> spp.
pan-hsia	tuber of <i>Pinellia ternata</i> Briet.
shao-yao	root of <i>Paeonia lactiflora</i> Pallas
shih-lung-ch'u	stem of <i>Juncus</i> spp.
shih-nan-ts'ao	not identified
shu	root of <i>Atractylodes ovata</i> (Thunb.) DC.
shu-chiao	seed of <i>Zanthoxylum simulans</i> Hance
ta-huang	rhubarb root ( <i>Rheum palmatum</i> L. or its relatives)
ta-tsau	fruit of <i>Zizyphus jujuba</i> Miller
t'ien-hsiung	tuber of poisonous aconit
t'ing-li	seed of <i>Descuraminia sophia</i> (L.) Prantl
tsao-chia	seed of <i>Gleditschia sinensis</i> Lam.
ts'eng-ching	malachite
tzu-wan	root of <i>Aster tataricus</i> L. fl. (ancient drug not identified)
tr'u-ssu-shih	seed of <i>Cuscuta chinensis</i> Lam.
wu-t'ou	tuber of poisonous aconit
ya-tzu	not identified
yuan-chih	root of <i>Polygala tenuifolia</i> Willdenow