

THAI TRADITIONAL MEDICINE: ANCIENT THOUGHT AND PRACTICE IN A THAI CONTEXT

by

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It is not always appreciated by those who are accustomed to providing or receiving the benefits of the complicated and highly sophisticated modern, or European, system of medicine that by far the greater part of the world's population depends, and has depended for thousands of years, on other systems of medicine for the prevention and treatment of illness. These systems have survived, not just because no alternative is available, but also because they appear to produce results.

Before the Christian era, the foundations of both the Chinese and Indian systems of medicine had been established. Ancient Greek medicine, which was preserved in Arabic texts from the seventh century A.D. to the thirteenth century by the scholars of the Islamic world, formed the basis of European medicine, and it was not until the fifteenth century that Europeans began to take the first progressive steps which were to result in the modern scientific system of medicine.

All those ancient medical systems have provided a wealth of literature, much of which has been translated into European languages. But there are many others still unknown beyond the borders of the countries in which they are followed. In Thailand, for unknown centuries, the health of many of the people has been cared for by practitioners of a traditional system of medicine not unlike those of ancient Greece, China, and India. And, as in China and India, this ancient form of medicine is still practised.

But traditional medicine is not the only means of health care in Thailand. Modern medicine is available to some extent, and other methods of treatment which existed in Thailand before the advent of European medicine still flourish. Among these are Chinese medicine, spirit medicine, folk medicine, and faith healing.

As a result of the efforts of such early pioneers of European medicine in Thailand as Dr. D.B. Bradley and Dr. George McFarland, and of those who followed them, modern medicine is now available in Bangkok and in many urban provincial areas, but it has scarcely reached the bulk of the population, the farming families of the rural areas, who number an estimated 35 million of a total of 43 million Thai citizens. As there are only about 4,000 physicians to

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The U.S. Library of Congress method of transliteration is used wherever possible for Thai words and names except where another romanized form has become established.

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serve the 8 million or so people living in the towns and cities, it is clear that even in the urban areas the majority of the Thai people obtain treatment for illness from other sources.¹

These other sources include self-medication with modern medicine. The laws governing the sale of modern medicine restrict the manufacture and sale of modern drugs to licensed persons, but do not require the patient to produce a doctor's prescription. Most medical practitioners dispense their own prescriptions, but members of the general public often treat themselves with modern medicine bought directly from pharmacies. However, a glance at the figures given in the following table will show that this practice is not widespread, being restricted mainly to Bangkok and other large centres.

Statistics on population and medical facilities, 1975

| | URBAN | | RURAL | TOTAL |
|---|----------------|------------------|------------|-------------------------|
| | <i>Bangkok</i> | <i>Provinces</i> | | |
| Population | 4,000,000 | 4,000,000 | 35,000,000 | 43,000,000 |
| Teaching hospitals | 83 | 1 | — | 4 |
| Other hospitals | 100 | 121 | — | 221 |
| Beds | 15,000 | 30,000 | — | 45,000 |
| Physicians | 2,500 | 1,400 | 100 | 4,000 |
| Clinics | 1,200 | 750 | 50 | 2,000 |
| Dispensaries : class A | 800 | 800 | — | 1,600 |
| Dispensaries : class B/C | 600 | 1,000 | 3,400 | 5,000 |
| <i>Per capita</i> spending on drugs (lowest trade prices in baht) | 262.50 | 157.50 | 12.00 | <i>Average</i> 48.83 |
| US\$ equivalent | 13.12 | 7.88 | 0.60 | 2.44 |

Notes:

1. This information consists of estimates obtained from an international pharmaceutical company. No reliable and complete statistics are available.
2. The law stipulates that all drugs may be sold through hospitals, clinics, and class A dispensaries. Class B/C dispensaries may only sell non-dangerous drugs in consumer packs. (That is, the whole pack is sold to the customer exactly as supplied by the manufacturer.) How they are sold is irrelevant here. It is clear that through all channels combined, relatively few modern drugs are sold in Thailand.

It is not even clear whether Thai traditional medicine reaches the majority, as figures to indicate the extent of its use cannot be obtained. Guesses of up to 9,000 legally qualified *mō bōrān* (หมอโบราณ: traditional doctors) have been made, but in addition to these there are many practitioners who have not obtained legal qualification, and self-treatment has been encouraged by the publication of home remedies derived from officially recognized texts. The system of medicine now known as traditional medicine, as opposed to modern of *farang* (ฝรั่ง: 'Western') medicine, probably developed from an earlier foreign system of medicine adopted by the

1. See table. As of 1975, approximately 4 million people lived in Bangkok, another 4 million in the urban provincial areas, and the remainder in the rural areas.

court, which has gradually filtered down to the rest of the people to be superimposed on their own methods of treatment. Nevertheless, it can be safely said that today Thai traditional medicine certainly reaches a greater number of people than any other systematic form of medicine practised in Thailand.

Official recognition is given to two main systems of medical practice. These are modern medical practice, which is legally defined as the practice of the healing arts by means of knowledge gained from study based on science, and the practice of traditional medicine which is defined as the practice of the healing arts by means of knowledge gained from traditional texts or study which is not based on science.

Consequently many people patronize more than one type of medical practitioner, but there is no way of gauging the extent of this at present. However, it is not only the shortage of modern facilities and personnel trained in modern methods which causes large numbers of Thai people to seek treatment from the *mā bōrān*; many do not resort to *farang* medicine when they are ill, even when it is available, and many, including some practitioners of modern medicine and pharmacy, seek the help of traditional medicine before or after obtaining treatment with modern medicine, especially if they have an incurable disease. The reason seems to be that traditional medicine fulfills a need which modern medicine does not satisfy.

As Thai traditional medicine is the medical system which reaches the greatest number of the Thai people, it is of the utmost importance to them, and to those who are concerned with their well-being. This has been recognized by the World Health Organization, which is encouraging the practice of Thai traditional medicine as the most practical method of providing basic health care for the Thai people, most of whom cannot expect to have access to modern medicine during their lifetime. Even if they did, much of it would be at variance with their customs, and so would be of little value to them.

An understanding of this system of medicine should provide some insight into the Thai way of life; it is also of great importance to those who wish to understand the Thai people and their culture, because the practice of medicine, like religion, with which it is often closely associated, reflects some of the fundamental attitudes of a people. It should be an advantage to know some of the basic principles of Thai traditional medicine its structure, function, and origins; to know why people with access to modern medicine still use the old system and why the World Health Organization finds it more suitable than modern medicine as a means of providing basic health care for the Thai rural communities.

Texts on Thai medicine

A theme common to nearly all Thai writings on traditional medicine is the need to preserve the ancient texts on medicine received from the ancestors, so that they may be handed down in their original form to future generations for their benefit.

During his restoration of Wat Phrachētṭuphon (Wat Phō), started in the year of the python, 1832, King Rama III ensured this continuity for many generations to come, by having all available knowledge of the finest quality in the fields of art, letters, technical skills, medicine,

and other disciplines engraved on stone plaques and fixed to the walls of the buildings of this Royal wat (วัด: temple), so that it would be accessible to all.

The inscriptions on medicine at Wat Phō include hundreds of ancient texts as well as dozens of illustrated diagrams of the human body showing the points on the body used in the practice of Thai massage, and verses describing exercises demonstrated by statues of yogis performing them.²

The example set by King Rama III was followed by King Rama V (Chulalongkorn), who, in the Year of the Horse, 1870, appointed a committee of court doctors to collect all known texts on medicine, and to check them, compare them with the originals, and revise them. He then had a record of them made and kept in the Royal Library as the basis for future dissemination of this knowledge.³

The Wat Phō Traditional Medical College Association has carried on this work by collecting and publishing ancient texts. Copies are presented to the King. In accordance with this spirit, most of their important publications bear a history of their contents, and it is mainly from these histories that we can get an overall history of these ancient texts, at least for the last 150 years.

From these texts the modern Thai student of traditional medicine learns his art, and perhaps, in the same way, the interested foreigner can try to understand it and possibly learn something from it as well.

The inscriptions on medicine at Wat Phō have been published in a single volume, *Tamrā phēsāt* (ตำราเภสัช; see note 21), but to date, only sketchy translations of a few of the texts have been published in English.

These inscriptions do not include all the ancient texts. Most of the officially recognized old texts on Thai traditional medicine are to be found in four volumes which constitute the syllabus for teaching Thai traditional medicine and pharmacy at the Wat Phō Traditional Medical College, namely *Phāetthayasāt songkhrō* (แพทยศาสตร์สังเคราะห์: The Study of Medicine, three volumes), published in 1961 by the Wat Phō Traditional Medical College Association, and, in an abridged form under a single cover, *Wētchasu'ksā phāetthayasāt sangkhēp* (เวชศึกษา แพทยศาสตร์สังเขป: Manual for Students of Traditional Medicine), originally edited and published in three volumes in 1909 (Bangkok era 127) by Phrayā Phitsanuprasātweṭ (พระยา [เจ้าคุณ] พิษณุประสาทเวช หรืออาจารย์คง).⁴

Although doctors and pharmacists of traditional medicine may use prescriptions which are not in these texts, they are obliged to register them. In other words, all innovations must be registered, and thus the authenticity of the texts is guaranteed. This requirement ensures the continuity of the tradition of handing down the ancient texts in their original form—a tradition remarked upon by Simon de La Loubère 300 years ago.

2. *Tamrā phēsāt* (Texts on Medicine), "History of the texts on medicine", p. 2.

3. *Phāetthayasāt songkhrō* (The Study of Medicine), vol. I: จ, ฉ: 1.

4. *Ibid.*, vol. I, foreword and preface, and vol. III, foreword.

The texts record the causes of diseases, their symptoms and diagnosis; the treatment of diseases, the medicines used, and the properties of the drugs used to make these medicines. There is some repetition in the texts, which are listed in the annex to this article, showing the volumes in which they appear, the names of the texts, and a brief summary of the contents of each.

Basic concepts in Thai traditional medicine

The medical systems of many of the great civilizations of antiquity are inextricably intertwined. From our present knowledge we cannot yet trace the philosophical origins of some of their basic medical concepts. I refer particularly to the following concepts, common to many of these systems of medicine: the elements as the underlying material principles of all phenomena; dyscrasias of the bodily humours as the ultimate causes of diseases; the climate and environment as major factors in the vitiation of the humours; and taste as the most important quality of drugs, by which their properties are known.

Whether the Greeks, Indians, and Chinese borrowed their ideas from each other has not been determined. From the Greeks and from the Indians through the Persians came Islamic medicine.⁵ What part was played by the earlier Egyptians and Babylonians is beyond the scope of this paper, but it seems almost certain that somewhere in the unknown past there was a common origin for each of these basic ideas. Many of them were communicated in Europe through the works of Hippocrates, Aristotle, and Galen⁶ up to the eighteenth century A.D.; and in Asia through Islamic, Ayurvedic and Chinese medicine to the present day. Thai traditional medicine, to a large extent, derives from such concepts.

From the historian's point of view it would be valuable to know how the Thai medical texts came into being, as this knowledge might provide fresh evidence of cultural diffusion. Are the Thai texts, which are studded with borrowed Sanskrit and Pali medical terms, inherited directly from the *Āyurveda* of India, or did they come via the great sea trade routes or via India as Arabic translations of Galen and Hippocrates, or from the Chinese empire to which much of Southeast Asia paid tribute? How much of Thai traditional medicine is Thai, and how much of it Mon or Khmer or of other local origin? Perhaps not all of these questions can be answered. The detailed study of all the texts should ultimately not only provide the answers to some of the questions about the history of Thai medicine, but also add to our knowledge and understanding of Thai civilization, because these texts throw light on Thai religion and folklore, customs and traditions, not to mention the vast field of botanical as well as medical knowledge yet to be elucidated about the hundreds of substances mainly of plant origin used by the Thai *mā bōrān* as medicine.

5. E.G. Browne, pp. 2, 21; Donald Campbell, vol. I, pp. 3, 46.

6. Some of the Greek works were translated directly into Arabic, but many were first translated into Syriac, then into Arabic. With Islamic accretions they were next translated, rather badly, into Latin. Browne, pp. 2, 3, 26.

From the fifteenth century A.D. when some of the Greek texts were found, Europeans began to study from new Latin translations taken directly from the Greek, and to reject those received through the Arabs. Campbell, vol. I, pp. 186, 187.

Association with Buddhism. For hundreds of years, probably since Buddhism first came to Thailand, the *wat* has been the source of much of the knowledge of medicine, and remains so to-day. Monks and laymen gain their knowledge from the same sources—ancient texts and experience. The two best-known schools of Thai traditional medicine in Bangkok are the Wat Phō Traditional Medical College, and the College of Traditional Medicine at Wat Mahāthāt. A few feet away from the classes, clinics are quietly conducted where patients silently appear, consult a doctor, and disappear.

Classes are held on Saturdays and Sundays throughout the year in the cloisters and pavilions of the two *wat*. There are two courses: pharmacy and medicine. In the first year the student studies pharmacy. If he wishes to continue and become a *mō bōrān* he attends for another two years. So a student may qualify as a pharmacist in one year, or as a pharmacist and doctor in three years. He cannot become a doctor without having studied pharmacy. When the student has completed the course he is licensed to practise by the government. Classes are also held for students of Thai massage. The schools are similar, and use the same sources of knowledge and the same textbooks, a part from slight variations in some of the modern handbooks written to simplify the study of the ancient texts.

In addition to the ancient texts, some of these modern handbooks have been used to provide the explanation of some of the principles of Thai traditional medicine which follows. The main modern source used⁷ includes some innovations borrowed from modern medicine, such as the use of the clinical thermometer, and the modern method used to take the pulse, as well as adding brief comments on anatomical and physiological functions of the body not given in the ancient texts. We can thus observe a process of adaptation to acceptable advances in thought. Despite the earnest attempts by the Thais to hand down their ancient texts unaltered, we can see the process of change in action, as slight modifications and additions are made, and old ideas, replaced, are imperceptibly forgotten.

The principles of traditional medicine. In the Thai system, *thāt* (ธาตุ: the elements), *utu* (ฤดู: the seasons), *āyu* (อายุ: age), and *kāla* (กาล: time) are believed to be the main *samutthān* (สมุฏฐาน: causal factors) of disease. Other important factors are *prathēt* (ประเทศ: place), and *mūnhēt* (มูลเหตุ: causes) arising from human actions and behaviour.

Altogether there are 42 elements which cause disease, which are classified as elements of earth, water, air, or fire. The number of seasons varies, in the texts, from three seasons each consisting of four months per year, to four seasons of three months, or six seasons of two months. Age is divided into three periods: early age, from birth to 16 years; middle age, from 16 to 32 years; and old age, from 32 to 64 years. Time refers to the time of day or night, each of which is divided into four periods of three hours, starting from dawn (6 a.m.) and dusk (6 p.m.) respectively.

The place where the patient was living at the time of the onset of the disease might have been hot, warm, cool, or cold, but these terms do not describe the climate, as is explained later in this article. The actions and behaviour from which causes of disease arise are the result

7. Matthayat Dārōt: see Bibliography.

of people forcing their bodies beyond normal capacity. They must act, without exception, according to their *thāt*.

From the 42 elements three groups of diseases arise. They are diseases caused by *dī* (ดี : bile), diseases caused by *lom* (ลม : wind or air), and diseases caused by *salēt* (เสลหฺม : mucus). Whenever the weather is unseasonable, all three of these causal factors usually become disordered, and the three combined are called *sannipātikā-āphātthā* (สันนิบาติกากาพาธา) The resulting illness is called *sannibāt* (สันนิบาต : combined disease).

Diseases are named according to three different systems. They may be named *rōk* (โรค : disease) of one of the *thāt*, meaning an abnormality of one of the elements, “because the word ‘*rōk*’ means *thāt phikān* or *thāt wikān* [ธาตุพิการ หรือธาตุวิการ] (abnormal *thāt*)”;⁸ they may be named according to the five senses, such as diseases of the eye, the ear, or the nose; or they may be given the names used in the medical texts, or determined by doctors, such as a cold, a fever, or eczema.

The diagnosis of disease is made by taking the history of the patient and his family, and the past and present history of the disease. Both mind and body are examined, and the symptoms are investigated. From this examination, the symptoms, the type of disease, its name, and primary cause are decided. The disease is then treated by medicine, by surgery (very minor surgery such as laving abscesses), by massage, or by magic spells and incantations. If medicine is to be used treatment, the appropriate drugs are decided upon.

The principles of traditional pharmacy. The pharmacist must know about the drugs, or substances used as medicine; the properties of drugs; the classification of drugs; and the dispensing of medicine. Drugs are obtained from plant, animal, and mineral substances. From the taste the properties of drugs are known. There are three principle tastes—hot, cool, and mild; and nine medicinal tastes—astrigent, sweet, *mao būa* (เมาเบื่อ),⁹ bitter, hot and spicy, oily, cool and fragrant, salty, and sour, as well as a bland taste. Drugs are classified into three groups, called *chunlaphikat* (จุลพิภัก : the Small Class), *phikat yā* (พิภักยา : the Large Class), and *mahāphikat* (มหาพิภัก : the Great Class); dispensing consists of the preparation of liquids, powders, pills and suppositories, and of medicine used for fumigating or smoking the body, for steaming, and for inhalation.

The causes of disease

The elements

The practice of Thai traditional medicine is based on the premises that there is always a cause for illness, that the causes can be specified, and that an abnormality in one or more causal factors can produce recognizable symptoms of disease. From the symptoms the cause is known.

8. *Ibid.*, pp. 19, 20.

9. The term *mao būa* is difficult to translate in one or two words. It may mean poisonous, intoxicating, and/or addictive, and normally refers to drugs which act on the central nervous system.

The elements which cause disease are *patthawi samutthān* (ปฐวีสมุฏฐาน) or *thāt din* (ธาตุดิน: the element earth), *āpō samutthān* (อาโปสมุฏฐาน) or *thāt nam* (ธาตุน้ำ: the element water), *wāyō samutthān* (วาโยสมุฏฐาน) or *thāt lom* (ธาตุลม: the element air), and *tēchō samutthān* (เตโชสมุฏฐาน) or *thāt fai* (ธาตุไฟ: the element fire). This concept of matter consisting of earth, water, air, and fire has much in common with the thought of the ancient Chinese, Greek and Indian philosophers.

For the Chinese philosophers of the middle of the first millenium B.C., the Doctrine of the Five Elements of metal, wood, water, fire and earth, together with the Doctrine of the Two Principles of *yin* and *yang*, the male and female elements in nature from which everything originates, formed the basis of Chinese medicine, as they still do today. The maintenance of health depends on the harmony of the elements. Disease results from their imbalance. The relationships of the five elements, *yin* and *yang*, the colours, points of the compass, parts of the body, tastes, animals, grains, seasons, planets, sounds, numbers and diseases are given in the *Huang Ti Nei Ching Su Wên*, which is the most influential Chinese medical text. It is traditionally considered to be the oldest known medical work, dating from 2698 B.C., but we cannot be certain of such a date since reliable Chinese history does not go back further than the eighth century B.C.¹⁰

The Greek philosophers developed a theory of four elements—earth, water, air and fire—as the underlying material principles of all things. Aristotle says “Some speak of the first principle as material, whether they regard it as one or several, as corporeal or incorporeal. . .” He is referring to the development of this theory, starting from Thales (640-546 B.C.), who conceived water as the underlying principle, Anaximenes (early sixth century B.C.) and Diogenes, who held that air is prior to water, Hippasus and Heraclitus (c. 500 B.C.), who maintained that the basic principle is fire, and Empedocles (493-433 B.C.), who added earth as a fourth element to those already mentioned and maintained that all four were fundamental in the cosmic process. According to Aristotle, Empedocles “was the first to maintain that the so-called material elements are four—not that he uses them as four, but as two only, treating fire on the one hand by itself, and the elements opposed to it—earth, air and water—on the other, as a single nature.”¹¹ But the doctrine of the four elements was established, to be incorporated into the works of Galen (130-200 A.D.) and thence into the medicine of Islam and Europe, where it was accepted until only two or three centuries ago.

The two most important classical texts of Indian Āyurvedic medicine are the *Caraka Saṃhitā* and the *Suśruta Saṃhitā*. There is some doubt about the dates when they were first compiled, but both claim that *Āyurveda*, the Science of Life, was first obtained from the gods. Āyurvedic medicine is thought to have developed from about the sixth century B.C., and the original *Caraka Saṃhitā* is considered by most scholars to have been written during the second century A.D., although some place it earlier than Patañjali (second century B.C.).

In considering the classification of substances, Caraka states that “for the purpose of this science, all substances are products of the five proto-elements”; earth, water, fire, air, and

10. Iza Veith, trans., pp. 110-115; and K. Chimin Wong and Wu Lien-Teh, pp. 15-28, 236.

11. Aristotle, pp. 19-49.

ether; in considering the classifications of man, he states: "man is said to be the sum of the six elements namely, ether and the four other proto-elements, the sixth being the element of consciousness".¹²

It has been suggested by Kutumbiah¹³ that Indian medicine could not have been borrowed from Greek medicine, because of fundamental differences. Among these is the fact that the Greeks considered that there were four elements, while the Indian philosophers postulated five. This argument cannot be accepted, for the following three reasons.

(a) Examination of the works of Empedocles and Aristotle shows that Greek philosophers did contemplate the fifth element, ether. Aristotle speaks of those who make their first principle air or water or 'something denser than fire but rarer than air'.¹⁴ Altschuller tells us "'aether' meant to Empedocles the most rarified substance, the fill of the universe. It was the Fifth Substance for Aristotle, identical to *pneuma* for the Stoics, and again something quite different to Galen, to René Descartes, to Newton, to the scientists of the nineteenth century or to Einstein and his followers."¹⁵

(b) Although the *Caraka Saṃhitā* is neither the work of one man, nor of one time—and inconsistencies are therefore to be expected—although the five proto-elements occur, frequently in that work, at least on one occasion we find mention of "the four elements of air, fire, earth and water. . ." ¹⁶

(c) Thai medicine appears to take into account only four elements, but it would be foolish to suggest that, for this reason, it cannot be related to Āyurvedic medicine. As is the case with the Greeks, the Thais acknowledge the existence of the fifth element. Matthayat speaks of "diseases of the four *thāt* and *ākāt thāt* อากาศธาตุ".¹⁷ In this context, "*ākāt thāt*" can only mean the element ether.

Before the Thais started to borrow Sanskrit and Pali words, they apparently had no word for the air around us, and no concept of what is referred to by the Greeks and Indians as the ether or *ākāśa* respectively. The Thai word for air, meaning the atmosphere (or the ether) is *ākāt*, borrowed from the Sanskrit *ākāśa*. The Thai word *lom* means wind, or air in motion, and even though all air is, in fact, in motion, this connotation is not included in *lom*. If the Thai concept of the elements was received from Āyurvedic medicine, which may have been the case, and if this occurred at a time when the concept of *ākāt* was foreign to Thai speakers, it can be understood why this concept does not normally occur in Thai medicine. Another reason could be that Buddhism in general rejects the idea of *ākāśa* as one of the elements of matter.¹⁸

12. Caraka, vol. V, pp. 162, 363.

13. P. Kutumbiah, "General introduction", pp. xl, xli.

14. Aristotle, p. 49.

15. Gregory I. Altschuller, "The origins of modern scientific thinking", *The Bulletin of the New York Academy of Medicine* (46:611-641, 1970), in Saul Jarcho, p. 6.

16. Caraka, vol. V, p. 375.

17. Matthayat, p. 318.

18. Louis Renou and Jean Filliozat, vol. II, 2263, p. 526. Since writing this article, the author has been informed by Professor Chalerm Phongsanit of Wat Pho Traditional Medical College that the *ākāt thāt* are the ten sensory organs: two eyes, two ears, two nostrils, the mouth, the two excretory organs, and the reproductive organs.

Considerable space has been given to this discussion of the place of the elements in the Chinese, Greek, Indian and Thai medical systems, because this concept is fundamental to the development of all that followed in medical thought in these civilizations and others which borrowed these ideas; and also in order to show that the history of ideas in the evolution of medical science is by no means straightforward. Much of the earliest recorded thought on the composition of matter can be traced back to the same few centuries, about the middle of the first millenium B.C., in the civilizations of China, Greece, and India. The coincidence is remarkable. We have historical records of contact between all three civilizations at least as early as the second century B.C., in the case of India and Greece, during the fourth century B.C.; with the invasion of India by Alexander of Macedon. And before this, there were Greek and Egyptian physicians at the Achaemenian court.¹⁹ We cannot presume there was no previous contact. The *Caraka Saṃhitā* reports the habits of many peoples, including the Chinese and Greeks,²⁰ but this may be a late addition to the work.

We do not know the origins of the Thai people; their historical records do not yet show how and when they first assimilated foreign ideas, including many of their medical concepts. But we know that Thailand is situated at the crossroads between the two great civilizations of China and India, and has been greatly influenced by both, and we tend to look to one or the other as the source of many foreign ideas assimilated into Thai culture.

At the same time, we must take into consideration possible Arab influence. The term 'Arabian medicine' refers to medical knowledge written in Arabic. Arabian medicine is based on Greek medicine, with Indian, Persian and Syrian additions. The famous medical school at Jundī-Shāpūr in southwest Persia was the centre of origin of much of this writing, produced mainly by Persians, Syrians, Jews and Greeks. Amongst the most highly esteemed Islamic medical works are those of Rhazes, 'Haly Abbas' and Avicenna, all of them Persians.²¹ Influenced by Indian medicine, Arabic medicine later travelled east to India, where it is known as *Yūnānī* (Greek) medicine, and no doubt it was carried with the spread of Islam to southeast Asia. The southern provinces of Thailand, in the Malay Peninsula, received much Islamic cultural influence, and are largely populated by Muslims. Through this influence, or directly from India, Arabic medicine may have carried Greek and Indian ideas to Thailand.

The conclusions reached about the constituents of matter by both the Greek and Indian philosophers may have occurred independently, or they may have influenced each other. As for the Chinese, they share with the Greeks, Indians, and Thais three of the four elements common to each school—fire, water and earth. The adoption by the Thais of the four elements, with the awareness of the fifth, leaves us with many alternative hypotheses as to how this was arrived at.

Thai medicine was not necessarily borrowed, as a complete system, directly from another culture. What was borrowed was almost certainly grafted onto an already established indigenous system, elementary or otherwise. The new doctrines and ideas may have come entirely from one already established system. They may also have come, a little at a time, from several

19. Browne, p. 22.

20. Caraka, vol. V, p. 925.

21. Browne, pp. 2-32.

sources. Whichever is the case, Thai medicine is now an independent system, a Thai system, not quite like any one of the many with which it shares features of obvious common ancestry.

Anatomy, physiology, and symptoms

According to their major constituents, 42 components of the body are classified as elements which cause disease: 20 of them are considered to belong to the category of the element earth, 12 to the element water, six to the element air, and four to the element fire. In listing these components of the body and the symptoms which arise when they are not functioning normally, Matthayat adds a brief description of the anatomy and physiology of each. For example, "1. *kēsā* (เกศา: the hair), which is the hair growing on the head. The hair serves to protect the brain from being affected excessively by heat and cold."²² As this does not occur in the *khamphī thāt-wiphang* (คัมภีร์ธาตุวิภังค์) and the *khamphī rōknithān* (คัมภีร์โรคนิทาน), the texts from which he takes his description of the names, symptoms, and classification of the *thāt*, it must be presumed that the structure and function of the body are not mentioned in the ancient texts, and that their inclusion is a modern innovation. He also gives the usual Thai word in parenthesis after each Pali word used in the texts to designate the body components, since the modern student is unlikely to know the meanings of the Pali terms. The 42 elements are described in the following quotation from Matthayat.²³

PATTHAWĪTHĀT [ปฐวีธาตุ: the element earth] constitutes twenty components [of the body]. They are:

1. *kēsā* [เกศา: the hair], which is the hair growing on the head. The hair serves to protect the brain from being affected excessively by heat and cold. Abnormalities of the hair cause a painful scalp, falling hair, and grey hair.

2. *lōmā* [โหลมา: the body hair]. This is the hair growing on the body, such as the eyebrows, beard, and body hair. When symptoms arise from changes in the body hair, the skin hurts, and the hair falls out.

3. *nakhā* [นขา: the nails] which grow on the fingers and toes. Disorders of the nails produce pain at the base of the nail, sometimes with inflammation giving rise to pus, and sometimes loss of the nail.

4. *thantā* [ทันตา: the teeth]. They are 1. the incisors, 2. the canines, and 3. the molars. The first teeth are called milk teeth. There are twenty. The second teeth are the real teeth. There are thirty two. Abnormalities of the teeth are the source of aching in the roots of the teeth, cavities in the teeth, ²⁴ pyorrhoea alveolaris, and abscesses.

5. *tačhō* [ตะโจ: the skin]. According to the texts, this is understood to mean only the exterior covering of three layers, the thick skin, the middle layer, and the epidermis. Alterations in the skin cause itchiness, and a feeling of roughness and irritation to the touch, and a stinging pain affecting the skin.

22. Matthayat, p. 5.

23. *Ibid.*, pp. 5-12.

24. *Māeng kin fan* (แมงกินฟัน), literally 'worms eat the teeth'. It was an old belief in many cultures that dental caries was caused by worms. Campbell quotes Shakespeare to illustrate the spread of this belief in England, possibly from Arabic medicine; vol. 1, pp. 203, 204.

Functions

- (i) To cover and protect the internal organs from dangers such as skin disease.
- (ii) To receive impressions of heat, cold, contact, and pain.
- (iii) To discharge matter from the body, and absorb matter into the body.
- (iv) To protect the body against the rays of the sun, and to help maintain body warmth when it is cold.

6. *mangsang* [มังสัง : the flesh]. This is the muscle tissue of the body. When it is abnormal, the flesh develops bruised, red patches, and a burning, stinging pain. The flesh becomes bruised, and develops moles and warts.

7. *nahārū* [นหารู : the tendons], the tendons and sinews throughout the body. Disordered tendons cause a feeling of constriction of the heart, so that one becomes restless, weak, and hungry.

8. *atthi* [อัฏฐิ : the bones]. There are cartilages and hard bones. They form the structure of the body. Abnormalities create pain in the bones.

Functions

- (i) To help support the organs of the body, to keep them in proper order.
- (ii) They are the parts used in movement.
- (iii) They are the skeleton of the solid part of the body, and the place of attachment of the muscles.
- (iv) They help protect the important organs.
- (v) There is marrow inside the bones, which helps make red corpuscles.
- (vi) To store calcium.

9. *athiminchang* [อัฏฐิมิญชัง] *yū'a nai kradūk* [เยื่อในกระดูก : tissue in the bones], should actually be called *khai* [ไข : marrow], not *yū'a* [เยื่อ : tissue], because it is the oil in the bones. When the bone marrow is malfunctioning, there is pain in the bones causing the oil to solidify into fat, and producing symptoms of beri-beri.

10. *wakkang* [วักกัง : the spleen] which is attached to the side of the stomach. When it is impaired, it causes alternate feelings of heat and cold, resulting in diseases such as *krasai lom* [กระษัยลม]²⁵ and painful spleen.

11. *hatthayang* [หทยัง : the heart], situated towards the left side of the chest. It is about the size of the person's fist. Disorders of the heart cause irritability, touchiness, short temper, and hunger.

Functions

To circulate the blood throughout the body, including the pulmonary circulation.

12. *Yaknang* [ยักนัง : the liver], situated in the rib cage towards the right side of the body. The pancreas is situated to the side of the body, attached to the liver. Abnormalities of the liver cause liver enlargement, downward displacement of the liver, and the painful symptoms of liver abscess.

Functions

- (i) To produce bile.
- (ii) To help the body to adjust to changes.
- (iii) To store fats. To help discharge toxins from the body.

13. *kilōmkang* [กิโลมกัง : fascia or connective tissue]. This is the flexible tissue throughout the body, or the tough, fibrous sheaths which hold the muscles together. Its impairment results in feelings of dehydration and thirstiness, and diseases such as *ritsidūang haeng* [ริดสีดวงแห้ง]²⁶

25. *Krasai* (กระษัย), *kasai* (กะษัย) a group of diseases of vague causation but producing general weakness and emaciation; *krasai klōn* (กระษัยกล่อน), for example, and enlargement of the scrotum, which may be an hydrocoele, orchitis or epididymitis.

26. *Ritsidiang*: a term applied to several chronic maladies; *ritsidūang hāeng*: tuberculosis with progressive anaemia.

14. *pihakang* [ปี่ทักัง : the kidneys]. There are two kidneys, right and left, exactly where the end of the loin cloth is tucked in at the back. When the kidneys are impaired, there is obstruction and congestion in the chest, causing distention of the stomach, a feeling of exhaustion and weakness, and puffiness.

Functions

To filter the blood which the body does not need, and discharge it as urine.

15. *papphāsang* [ปี่ปผาสัง : the lungs], situated on both sides of the chest. Disorders of the lungs cause thirst, heartburn, and laboured breathing called *kān khu'n thī pōt* [ภาพขึ้นที่ปอด].

Functions

(i) For breathing. To purify the blood.

(ii) To help maintain body heat at its normal temperature.

(iii) To help transport water from the body as vapour, which is expelled with the breath.

16. *antang* [อันตัง : the large intestine]. There are two sections; the upper part including the stomach; and the lower part, which continues from the small intestine to the rectum. Weakness, and a feeling of fullness and contraction of the bowel result from its malfunction.

17. *antakhunang* [อันตคุนัง : the small intestine]. This is not²⁷ connected to the lower section of the large intestine. (Some texts call it *sāirat sai* [สายรัดไส้], the intestinal band.) When abnormal it causes belching, yawning, blood and pus in the faeces, faintness, aching muscles in the region of the waist, gripping pain in both sides, and burning in the stomach and throat.

18. *utthariyang* [อุทริยั้ง : undigested food]. The food in the upper part of the intestines, in the stomach. Disorders cause diarrhoea, colicky pain, dry retching, and hiccoughs.

19. *krīsang* [กรี่สัง]. The waste matter which is discharged from the small intestine into the lower section of the large intestine, and into the rectum. Abnormalities cause irregular bowel motions, and disorders of the *thāt*, generally due to *tān khamōi* [ตานขมอย],²⁸ and cause *ritsūdūang*.

20. *matthakēmatthalungkhāng* [มัตตเกมัตตลูงคัง : the brain]. This is the substance in the skull, as well as in the spinal cord. Symptoms resulting from disorders of the brain are headache, deafness, and stiffness of the tongue and jaw.

Functions

(i) To carry out functions concerned with memory, thought, intelligence, careful consideration, and sense of responsibility.

(ii) To control body function, and to enable us to see and hear, speak, feel, smell, and taste, because it is the centre of the nervous system.

Remarks

According to the dictionary, the word *wakkam* or [วักกั] *wakka* [วักกะ] means *tai* [ไต : kidney], [It used to mean *mām* (ม้าม : spleen)].

According to the dictionary, the word *pihakam* [ปี่ทัก] or *pihaka* [ปี่ทกะ] means *mām* [spleen]. [It used to mean *tai* (kidney)].

ĀPŌTHĀT [อาโปธาต : the element water] constitutes twelve components [of the body]. They are:

1. *pittang* [ปิตตัง : bile], which is divided into two kinds: *phatthapitta* [พัทธปิตต : bile in the gall bladder]; and *aphatthapitta* [อพัทธปิตต : bile outside the gall bladder], which flows into the intestines, the bile which is secreted in the liver.

27. This seems to be a misprint, which should read: "it is connected".

28. *Tān khamōi*: a common chronic ailment of Siamese children characterized by thin arms and legs but enlarged abdomen (usually due to intestinal worms).

When the bile is not normal,

- (i) The bile in the gall bladder causes symptoms of delirium.
- (ii) The bile outside the gall bladder causes headache, a raised temperature, alternate feelings of heat and coldness, jaundiced eyes and urine, and fever.

Functions

To help in the digestion of food [which causes] the bile to flow.

- 2. *sēmhang* [เสมหะ : mucus], which is divided into three kinds. They are: *sṛsēmha* [สอเสมหะ], the mucus in the throat; *urasēmha* [อุระเสมหะ], the mucus in the windpipe; and *khūtthasēmha* [อุทเสมหะ], the mucus which comes from the rectum. Actually, it occurs in other places too.

When the mucus is not normal,

- (i) The mucus in the throat causes sore throat, dry throat, and asthma.
- (ii) The mucus in the windpipe causes wasting and jaundice, *pen dānpethao* [เป็นค่านเป็นเทา],²⁹ a piercing pain in the chest, and dry chest.
- (iii) The mucus which comes from the rectum causes mucus and blood in the faeces, as with dysentery.

Functions

- (i) To help lubricate the throat and oesophagus so that swallowing is made easy.
- (ii) To help lubricate all parts of the intestines so that food and waste matter can move freely.
- (iii) To help prevent injury to the throat, oesophagus, and intestines.

- 3. *pupphō* [ปุพฺพ : pus], which comes from wounds, and is produced as a result of cuts and bruises for example. Abnormal pus causes coughing, loss of appetite, and loss of weight.

- 4. *lōhitang* [โลหิตัง : blood]. There are two kinds: venous blood, and arterial blood,³⁰ permeating various parts of the body. Blood disorders cause fever, resulting in delirium, red urine, spots and black and red patches on the skin, and diseases such as bubonic plague.

Functions

- (i) To carry the digested food to nourish the body.
- (ii) To maintain normal body temperature.
- (iii) To carry pure air from the lungs to various parts of the body.
- (iv) To carry waste matter and discharge it in the lungs, kidneys, and skin to be expelled.

- 5. *sēthō* [เสโท : perspiration]. The perspiration which comes from all over the body. Changes in the perspiration cause restlessness, make the body cold, and cause weakness and exhaustion, and depression.

- 6. *mēthō* [เมโท : the body fat]. This is the yellowish-white fat of the body. When it is impaired, it erupts in patches on the skin causing a burning, stinging pain of the skin, and exudation of fluid.

Functions

To supply heat to the body, and to produce energy.

- 7. *atsu* [อัสสุ : tears]. The clear fluid which flows from the eyes. With changes in the tears there is blurred vision, the eyes water, and there is corneal opacity or corneal ulceration.

Functions

To lubricate and protect the eyes from becoming dry, and to help expel foreign bodies such as dust from the eyes.

29. *Pen dān pen thao* or *thao dān* (เทาदान) suffering from a hard, immovable abdominal lump or mass.
30. Literally, dark blood and red blood.

8. *wasā* [วสา : lymph], which releases the oil and serum into the body. Abnormalities result in jaundiced skin and eyes, and diarrhoea.

9. *kh⁻lō* [ทโฬ : saliva]. The saliva which enters the mouth from the salivary glands. When the saliva is altered, the throat is sore, and there are pustules on the throat and at the base of the tongue.

Functions

To soften food [which it does] because it has an alkaline effect, to help in mastication, and to enable food to be swallowed smoothly.

10. *singkhānikā* [สิงขานิกา : clear mucus]. The clear liquid which comes from the nose. Changes in the nasal mucus cause pain inside the skull, blurred vision, and nasal discharge.

Functions

To obstruct and prevent dirt from entering the lungs, and to moisten the nasal membranes.

11. *lasikā* [ลสิกา : fluid in the joints]. When it is disordered, it causes pain in the joints and inside the bones.

Functions

To lubricate all the joints, enabling movement.

12. *mūttang* [มุตตัง : the urine] which is discharged from the urinary bladder. Abnormal urine causes changes in its colour, and smarting pain in the urethra and bladder.

WĀYŌTHĀT [วาโยธาตุ : the element air] constitutes six components (of the body). They are:

1. *uthangkhamāwātā* [อุทซังคมาวาตา], the air which starts from the feet and rises to the head, but some say, which starts from the stomach and rises to the throat, such as in yawning or belching. When it is impaired, it causes such things as restless hands and feet, suffering from abdominal discomfort, a feeling of heat in the stomach, yawning and belching, and flatulence due to mucus.

2. *ōttakhamāwātā* [โอทคมาวาตา], the air which starts from the head and descends to the feet, but some say, which starts from the small intestine and descends to the rectum, such as in passing wind. Disorders cause inability to raise the hands and feet, and aching in all the joints.

3. *kutchisayāwātā* [กutchisayawata], the air in the abdominal cavity. Abnormalities cause the stomach to rumble (borborygmi), dizziness, and aching in all the joints.

4. *kothāsayāwātā* [โกทฐาสยวาตา], the air which circulates in the intestines and stomach. When it is changed, it causes congestion in the chest, colicky pain, vomiting, and aversion to food.

5. *angkhamaṅghānusāriwātā* [อังกม้งฆานุสารีวาตา]. the air which circulates throughout the body. Blood used to be called *lom* [ลม : air]. Abnormalities cause blurred vision, dizziness, pain in the front of the thighs, painful spleen, dry retching, inability to eat, and alternate sensations of heat and cold.

6. *atsāsapatsāsawātā* [อัสนาสะปัสสะสวะวาตา : the breath], the air inhaled and exhaled. When it is disordered it causes difficulty in breathing. Breathing becomes shallower and shallower until there is inability to breathe.

TĒCHŌTHĀT [เตโชธาตุ : the element fire] constitutes four components [of the body]. They are:

1. *santappakkhī* [สันตปป์คคี], body heat, which warms the body. When it is impaired, it causes the body to become chilled.

2. *parithaihakkhī* [ปริทัยคคี], the heat which makes the body feel hot and uncomfortable, requiring bathing and fanning. When it is abnormal, it creates feelings of heat internally and externally, cold hands and feet, and it causes perspiration.

3. *chīranakkhī* [ชี่รณัคคี], the heat which causes senility, and causes the body to wither and dry, to deteriorate, and lose condition.

4. *parināmakkhī* [ปรีณามัคคี], the heat to digest food and cause its decomposition. When it is altered, it causes stiffness in the wrists and ankles, phlegm in the throat and air passages, that is, a cold with pain, causing coughing, painful palms of the hands and soles of the feet, rigidity of the stomach and nausea.

I do not propose to compare the anatomy, physiology, and symptomatology presented here with modern medical concepts—that I leave to those more competent to do so. But it is obvious to the layman that the concept of the human body, as illustrated by this description of its 42 elements and the symptoms to which they give rise, results from a system of classification quite different from that used in modern medicine. While some parts of body considered at present to be important are missing, it must be looked at for what it is—an alternative system—which takes a comprehensive view of the human body as a complete and co-ordinated organism. Given this concept of the body as a whole, with the parts classified, not according to their isolated function, but according to the different kinds of substances or tissues of which they are composed, the pattern is clear. What is missing that cannot be accounted for by a combination of two or more of these 42 elements? Very little, apart from what the Thais call *sēn* (เส้น), which is used to mean veins and nerves and any length of filament, fibre, or thread-like structure of organic tissue, which is possibly included in *kilōmkang*, connective tissue, or *nahāru*, the sinews and tendons. Perhaps all the body secretions are included in one or other of the subdivisions of the element water. And so, this could be described as a very simple, yet systematic list of the constituent substances of the body—a consistent, scientific system.

Nevertheless, as the basis of a system of medicine, it does not seem complete. It is as if only part of a vital text has been preserved. That text was not from the Āyurvedic classic, the *Caraka Saṃhitā*, as we have received it, but it would not be unreasonable to presume a common antecedent for the Thai texts *khamphī thātūwiphang* (คัมภีร์ธาตุวิภังค์) and *khamphī rōknithān* (คัมภีร์โรคนิตาน), which are the sources of the material under discussion, and chapter VII of the “*Sārītra Sthāna*” (“The section on the human embodiment”) of the *Caraka Saṃhitā*.³¹

Chapter VII of “The section on the human embodiment” is entitled “The enumeration of the parts of the body”. It follows the same system of classification as the Thai system, but starting with a classification of the body parts in their undifferentiated form—the arms, legs, head, neck, and trunk—the component parts are systematically subdivided and enumerated right down to cells and atoms. The subdivision immediately preceding cells and atoms lists the parts of the body referable to each of the elements (including the element ether, which the Thai texts omit), and it is here that there is a noticeable similarity.

Whatever in the body is predominantly made up of the following is referable to the proto-element earth—parts that are gross, firm, solid, heavy, and hard, *viz.*, nails, bones, teeth, flesh, skin, feces, hairs of the head, face and body, tendons as well as odor (*sic*) and the sense of smell. Whatever in the body is predominantly made up of the following is referable to the proto-element water. Parts that are fluid, mobile, slow, unctuous, soft and viscid, *viz.*, body nutrient fluid, blood, fat, mucus, bile, urine and sweat etc. . . .

31. Caraka, vol. V, pp. 410-413.

Fewer details are given about the parts referable to fire, air and ether, In fact, this list is briefer than the Thai list, which leads one to consider the possibility of an earlier source for both.

Some of the notable differences between the Thai texts and others occur in the enumeration of some of the parts of the body. For example, the *khamphī rōknithān* gives the numbers of muscles as 500; *sēn* (here meaning tendons) as ten principle *sēn*, and 2,700 auxiliaries; and bones as 300³². Caraka counts 360 bones, including the teeth and nails, and six layers of the skin, as opposed to three in the Thai system. The Chinese also give the number of bones as 360, but according to Wong, "for the simple reason that there are the same number of degrees in a circle".³³

An indication of a possible variety of sources for the ideas embodied in the Thai texts is given in *phrakhamphī chanthasāt* (พระคัมภีร์ฉันทศาสตร์). Here, the human body is likened to a city, the mind or soul is the king, the enemy is disease, and the doctor is compared to a soldier. If we turn to the *Nei Ching*,³⁴ we find a similar comparison. Here, various parts of the body are compared to twelve officials: "the heart is like the minister of the monarch who excels through insight and understanding . . . the liver has the functions of a military leader . . ." It concludes:

When the monarch is intelligent and enlightened, there is peace and contentment among his subjects . . .

But when the monarch is not intelligent and enlightened, the twelve officials become dangerous and perilous . . .

Once again, each text seems to tell part of the same story, suggesting a common antecedent for both Thai and Chinese sources, or else a Thai simplification of the ideas expressed in this section of the *Nei Ching*.

But the idea for the Thai version appears to have come from Indian sources, because the term *kāyṅakhōn* (กายนคร), here taken to mean that the body is like a city, is the Sanskrit *kāyanagara* having the same meaning. In addition, a similar story occurs in Indian literature in a didactic play on medicine, *Jivānanda*, written by a learned Brahmin of the seventeenth century A.D.³⁵ This, coupled with the similarity between the Thai classification of the body components and that of Caraka, as well as the similarity between the Thai and Āyurvedic concepts of the elements, strengthens the conclusion that Thai traditional medicine derives its basic concepts from Āyurvedic medicine.

Although most of the medical terms used in Thai traditional medicine are of Sanskrit or Pali derivation, this alone cannot be taken as proof that the ideas expressed by these Indian words are also Indian, because the original texts of the Thai doctors were written mainly in Pali language and Khmer script, as was the practice in recording sacred and royal texts. Besides linguistic evidence, other corroborating evidence is required to determine the origins of any Thai texts written in this style.

32. *Phāetthayasāt songkhro* . . . , vol. II, pp. 192-194.

33. Wong and Wu, p. 21.

34. Veith, p. 133.

35. Henry R. Zimmer, pp. 61-71.

The humours

Allied to the ancient concept of the elements as the underlying material principles of all things, was the concept of what have been termed the 'humours' as the ultimate causes of disease. This concept was as basic to the Greek system of medicine as it was to the Indian Āyurvedic system. The Greek theory of the four humours, blood, yellow bile, black bile and phlegm or mucus as causes of disease appears in the writings of Hippocrates (c. 460-377 B.C.). A doctrine of *pneuma*, or vital air, developed as a separate concept.

Such a theory did not emerge in Chinese medicine, where the interactions of *yin* and *yang* were held responsible for disease. Nevertheless, in Chinese medicine, according to the *Nei Ching*, the major predisposing cause of disease was wind, which is one of the *tri-doṣa* (three humours) of Āyurvedic medicine.

In the introduction to his translation of the *Suśruta Saṃhitā*, one of the classical texts on Āyurvedic medicine, Kaviraj Kunjalal Bhishagratna writes "By a lamentable oversight the terms *Vāyu*, *Pittam*, *Kaphah* and *Dosha* have been translated as wind, bile, phlegm and humour in the first few chapters,"³⁶ This contention of some Indian commentators, implying that there has been some misunderstanding of the meanings of these words, has also been dealt with in the preface to the translation of the *Caraka Saṃhitā*, in which the writer has explained in great detail his understanding of the *tri-doṣa*. It is, briefly, as follows.

The early Āyurvedic philosophers saw the microcosm of life as a trinity of spirit, mind, and body; the organization of the body as the result of a trinity of processes—thermal or metabolic, physical or structural, and vital or kinetic processes. In the macrocosm, their prototypes were the action of the sun, the water, and the vital air. The five elements became three: *pitta* (fire); *kapha* or *ślesmā* (earth and water); and *vāta* (air and ether). The doctrine of the *tri-doṣa*—*pitta*, *kapha*, and *vāta*, the metabolic, structural, and kinetic processes of the body, as the sustainers of life—is the essential theory underlying the practice of Āyurvedic medicine. An increase or decrease in function or structure, of one or more of the three, causes minor illness; if it progresses, the *doṣa* become vitiated, leading to more serious illness. All causes of disease act, ultimately, through the *tri-doṣa*.

In Thai medicine, there are three groups of diseases arising from the 42 elements. They are diseases caused by *dī* (ดี: bile); diseases caused by *lom* (ลม: air or wind); and diseases caused by *salēt* (เสลดขม: mucus).³⁷ The use of the word *salēt*, from the Sanskrit *śleṣmā*, together with the formal names of these three types of disease, is significant. These names are *pitta samutthān āphātthā* (ปิตตะสมุฏฐานอาพาธา: diseases caused by *pitta*: ปิตตะ), *vāta samutthān āphātthā* (วาตะสมุฏฐานอาพาธา: diseases caused by *vāta*: วาตะ), and *sēmha samutthān āphātthā* (เสมหะสมุฏฐานอาพาธา: diseases caused by *sēmha*: เสมหะ). The Sanskrit equivalents of *pitta*, *vāta*, and *sēmha* are *pitta*, *vāta*, and *kapha* or *śleṣmā*. Undoubtedly the origin of the use of this concept in Thai medicine is the Āyurvedic doctrine of the *tri-doṣa*. But since the Thai words for *pitta*, *vāta*, and *kapha* are *dī*, *lom*, and *salēt*, I would suggest, that while it is possible with modern scientific knowledge to interpret *pitta*, *kapha*, and *vāta* as metabolic, structural, and kinetic

36. Suśruta, vol. I, preface, p. iii.

37. Matthayat, p. 12.

processes, the interpretation conveyed to the Thais was exactly the same as that understood by the English speakers who first translated these words, because the English meaning is the same whether the *tri-doṣa* are translated from Sanskrit or from Thai—bile, wind, and mucus or phlegm. For this reason, I think it can be presumed that the ancient Indian pandits intended nothing more.

Climate and environment

The relationship between climate and environment and disease is recongized by most medical systems. In modern medicine, the increase in the incidence of certain diseases at particular times of the year, such as the common cold and influenza in winter, and allergic reactions to pollens in spring, are examples. Hippocrates drew attention to these phenomena, and Caraka and Suśruta devoted chapters to them, as did the ancient Chinese.

The seasons. It would seem that the part played by climatic changes in Thai medicine has been determined by at least three different influences, because three different systems of calculating the seasons are used. The year may be divided into three seasons of four months, four seasons of three months, or six seasons of two months, as follows:³⁸

Three seasons per year. The year is divided into three seasons, each of four months.

1. *khimhantaru'dū* [คิมหันตฤดู: the hot season] is considered to start on the first night of the waning moon night of the fourth month and to end on the fifteenth night of the waxing moon of the eighth month. The hot weather supports the human body. When the hot external air associates with the human *thāt*, it merges with the normal body heat, but whenever the weather is cool, and there is a combination of rain and cold weather, people are likely to become ill. It has been established that, in the hot season, the cause of disease is *santappakhi* (body heat).

2. *wasantaru'dū* [วสันตฤดู: the rainy season] is considered to start on the first night of the waning moon of the eighth month, and to end on the fifteenth night of the waxing moon of the twelfth month. The cool, wet weather supports the human body. When the cool external air associates with the human *thāt*, it merges with the normal coolness, but whenever the weather is alternately cold and hot, people are likely to become ill. It has been established that, in the rainy-season, the cause of disease is *kutchisayāwātā* (the air in the abdominal cavity).

3. *hēmantaru'dū* [เหมันตฤดู: the cold season] is considered to start on the first night of the waning moon of the twelfth month, and to end on the fifteenth night of the waxing moon of the fourth month. The cold weather supports the human body. When the cold external air associates with the human *thāt*, it merges with the normal coldness, but whenever the weather is alternately hot and cool, people are likely to become ill. It has been established that, in the cold season, the causes of disease are mucus and blood.

At the changes of seasons throughout the year, with such mixtures of hot, cool, and cold weather, the association of external and internal *thāt* creates imbalance in men's bodies. During changes of seasons, there is a tendency towards variable weather, which causes abnormal conditions. A person's body *thāt* may not adjust quickly enough, so that, when they clash with the unseasonable weather, illness results.

38. *Ibid.*, pp. 12-14. According to the Thai calendar, the first month begins about December; New Year starts in mid-April.

Four seasons per year. The year is divided into four seasons, each of three months.

The first season is considered to start on the first night of the waning moon of the fourth month, and to end on the fifteenth night of the waxing moon of the seventh month. Fire is the primary cause of illness.

The second season is considered to start on the first night of the waning moon of the seventh month, and to end on the fifteenth night of the waxing moon of the tenth month. Air is the primary cause of illness.

The third season is considered to start on the first night of the waning moon of the tenth month, and to end on the fifteenth night of the waxing moon of the first month. Water is the primary cause of illness.

The fourth season is considered to start on the first night of the waning moon of the first month, and to end on the fifteenth night of the waxing moon of the fourth month. Earth is the primary cause of illness.

Six seasons per year. The year is divided into six seasons, each of two months.

The first season is considered to start on the first night of the waning moon of the fourth month, and to end on the fifteenth night of the waxing moon of the sixth month. If illness arises, it is because of the element fire, bile, and *kamdao* [กัมตาด : internal heat].

The second season is considered to start on the first night of the waning moon of the sixth month, and to end on the fifteenth night of the waxing moon of the eighth month. If illness arises, it is because of the element fire, air, and internal heat combined.

The third season is considered to start on the first night of the waning moon of the eighth month, and to end on the fifteenth night of the waxing moon of the tenth month. If illness arises, it is because of the element air, and mucus.

The fourth season is considered to start on the first night of the waning moon of the tenth month, and to end on the fifteenth night of the waxing moon of the twelfth month. If illness arises, it is because of the element air, mucus, and urine.

The fifth season is considered to start on the first night of the waning moon of the twelfth month, and to end on the fifteenth night of the waxing moon of the second month. If illness arises, it is because of mucus, internal heat and blood.

The sixth season is considered to start on the first night of the waning moon of the second month, and to end on the fifteenth night of the waxing moon of the fourth month. If illness arises, it is because of the element earth, blood, air, and internal heat combined with mucus.

It might be difficult to discover who introduced to Thai medicine these three ways of calculating the seasons, but their origin seems simple to understand. In the tropics there are only two seasons: wet and dry; in the temperate zones there are four seasons: summer, autumn, winter, and spring; and in Thailand there are three: the hot season, the rainy season, and the cold season.³⁹ The people who calculate six seasons must live in a country with a combination of two or three of these types of seasonal change. This would necessarily be a large country, within a wide range of latitudes, such as India. And we find this is so.

39. In southern Thailand there are only two seasons, the hot season and the rainy season.

The *Caraka Saṃhitā* states :

Now the year, it should be known, consists of six parts when divided according to the seasons. From among these, the three seasons from the dewy season to the summer represent the sun's northern course and his period of absorption; while the three seasons from the rains to the winter represent the sun's southern course and his period of liberation.

These six seasons are called winter, the dewy season, spring, summer, the rains and autumn—a combination of the seasons of the tropics and of the temperate zones, the rains and the dewy season representing the wet and dry seasons of the tropics.⁴⁰ The four seasons of three months originate in a temperate climate, so that it is not surprising to find that both Arabic medicine, originating in Greece, and Chinese medicine refer to the four seasons as factors in health and disease. The three seasons of four months, the hot season, the rainy season, and the cold season, are natural to most of Thailand, and have Thai names as well as the borrowed Indian names used in traditional medicine.⁴¹ The three seasons are also known in Indian literature, and are mentioned by Caraka in conflict with his statement that the year consists of six seasons.⁴²

Thus it seems likely that the division of the year into six seasons is derived from Āyurvedic medicine, and the division into four seasons indicates possible Chinese or Arabic influence. But it should be noted that it is the division of the year into three seasons which is explained in the greatest detail, and which obviously prevails because it is natural to the climate of Thailand, although it coincides conveniently with the alternative Indian method of reckoning the seasons. Perhaps, in viewing the all-embracing Thai approach to the calculation of the seasons, we are witnessing the manner in which they have succeeded in absorbing ideas from other cultures, while adhering to their own.

Place or habitat. The method used in Thai traditional medicine to define the types of habitat poses another question. A high place, meaning mountains, is called a hot place; a place which has water, pebbles, and sand is called a warm place; a place which has rain and mud is a cool place; and a place which has salt water and mud is a cold place, as the following quotation explains.⁴³

prathēt samutthān [ประเทศสมุฏฐาน] means that the place of residence at the time of the onset of the disease is the primary cause. The place of residence is also one of the primary causes of disease.⁴⁴ Whether the climate is hot or cold, people become accustomed to it, and so do the *thāt* in their bodies. When anyone changes his place of residence, he might get an illness called

40. Caraka, vol. V, pp. 36-40. "Winter and the dewy season are similar in nature; yet there is a slight distinguishing characteristic in the dewy season, namely, the dryness born of the sun's absorbing period and the cold born of clouds, wind and rain."

41. The borrowed Pali term *gimhāna*, which becomes *khimhanta* in Thai, to mean the 'hot season', is equivalent to the Sanskrit *grīṣma*, 'summer'. But the Thai *vasanta*, 'rainy season', does not correspond to the Sanskrit *vārṣa* or *prāvṛṣṭi*, 'the rains', or 'the first rains', but to *vasanta*, meaning 'spring'. Also, the Thai *hēmanta* means the 'cold season', which is not quite the same as 'winter', the Sanskrit meaning of *hēmanta*.

42. Caraka, vol. V, p. 67.

43. Matthayat, p. 16.

44. In addition to the four major causal factors: the elements, the seasons, age, and time.

khai pā [ไข้ป่า; forest fever] or *khai phit ākāt* [ไข้ผิดอากาศ; fever due to change of weather], because the *thāt* themselves are not accustomed to the place. Four kinds of *prathēt samutthān* have been determined in order to indentify the causes of diseases in each place, as follows:

1. Those, such as mountain dwellers, born in a high place. This is called a hot place. The cause of disease in people of this place is fire.
2. Those born in a place which has water, pebbles, and sand. This is called a warm place. The causes of disease in people of this place are water, bile, and blood.
3. Those born in a place which has rain, and mud. This is called a cool place. The cause of disease in people of this place is air.
4. Those born in a place which has salt water and mud. This is called a cold place. The cause of disease in people of this place is earth.

These definitions obviously have no relation to climate, as even in the tropics mountains are cool. It is more likely to be the case that the qualities hot, warm, cool and cold apply to the respective causes of diseases in each place—fire: hot; water, bile, and blood: warm; air: cool; and earth: cold.

This system of classification of places and the corresponding causes of diseases is unlike any other mentioned in references to similar medical systems so far examined for this study. It is not the same as the Greek-Arabic classification of the qualities of the four humours, which are hot, dry, cold and moist.⁴⁵ Nor is it the same as the five types of climate, corresponding to the five elements in Chinese medicine, which are hot, windy, moist, dry and cool.⁴⁶ It may be a purely Thai development, based on local experience. Further clarification of the Thai texts might provide an explanation.

Age, time, and other causes of disease⁴⁷

The age of the patient is considered to be one of the primary causal factors of disease, and the elements which are affected by age so that they cause illness, vary during life.

Early age, from birth to 16 years, is subdivided into two periods: from birth to 8 years, and from 8 years to 16 years. During the first period, the major cause of illness is mucus, with blood as a minor cause. These causes are reversed between the ages of 8 and 16 years, so that blood becomes the major cause, and mucus loses its force. Taking the whole period of early age from birth to 16 years into account, the cause of illness is water, the elements mucus and blood developing disorders.

Diseases occurring during middle age, from 16 to 32 years, are caused by the element water, with disturbances of the blood in a ratio of two parts to one of air.

The element air is the cause of diseases of old age, from 32 years to 64 years, and beyond 64 years until death, the element air is still the major cause, with the element water as the minor cause, with disorders of the elements mucus and perspiration occurring. The shortness of the average life expectancy is plain to see when old age begins at 32 years.

45. Browne, p. 116.

46. Wong and Wu, p. 20.

47. Matthayat, pp. 14-18.

kāla samutthān [กาลสมุฏฐาน] means time is the primary cause of the disease. *kāla samutthān* is divided into four periods during the day, and four periods during the night.

Daytime

1. From dawn to nine o'clock in the morning (06.00 hrs. to 09.00 hrs.). The cause is the element water, with abnormalities of mucus.
2. From nine o'clock in the morning to midday (09.00 hrs. to 12.00 hrs.). The cause is the element water, with blood disorders.
3. From midday to three in the afternoon (12.00 hrs. to 15.00 hrs.). The cause is the element water, with disorders of the bile.
4. From three in the afternoon to dusk (15.00 hrs. to 18.00 hrs.). The cause is the element air.

Night time

1. From dusk to nine at night (18.00 hrs. to 21.00 hrs.). The cause is the element water, with abnormal mucus.
2. From nine at night to midnight (21.00 hrs. to 24.00 hrs.). The cause is the element water, with blood disorders.
3. From midnight to three in the morning (24.00 hrs. to 03.00 hrs.). The cause is the element water, with bile disorders.
4. From three in the morning to dawn (03.00 hrs. to 06.00 hrs.). The cause is the element air, with abnormalities of air.⁴⁸

These are the five primary causes of disease. This is the basic knowledge in the Royal Medical Texts mentioned at the beginning. The *mūn* [มูล : causes] of disease are mentioned elsewhere in the texts to facilitate the study of the origins of diseases. Those causes of disease arise from human actions and behaviour. People must act, without exception, according to their *thāt*. They should not force their bodies beyond normal capacity. This occurs in the following ways:

1. *Food* is important in nourishing the body. If care is not taken over what is eaten, there may be harmful results. For example, if too much or too little food is taken; if food is spoilt; if food has an unusual taste; and if meals are taken at irregular hours.
2. *Posture*. In their everyday movements, changing position in sitting, lying down, rising, and walking, people should be careful about what they do. If a person persists in any action longer than he should, not allowing the body to change position, the tendons will change from normal and cause illness to arise.
3. *Heat and coolness*. If a person accustomed to living in a hot place is exposed to extreme coolness, or a person accustomed to living in a cool place is exposed to extreme heat, such as:- a person used to the shade going out into the hot sun without protection, or having to go out in the rain or dew, or being immersed in water for a long time — these things will cause illness.
4. *Lack of sleep, food, and water*. If for any reason a person cannot go to sleep at bed-time, and has to stay up longer than he should, or cannot eat when it is time to eat, and cannot get something to drink when he is thirsty, these things can be the cause of illness.
5. *Suppression of defaecation and micturition*. Usually, if defaecation and micturition are suppressed for too long, it causes changes in the body *thāt* leading to the occurrence of disease.
6. *Working excessively*. That is, engaging in manual labour involving lifting, carrying, pulling, and pushing things, overtaxing the body, or over-exertion in running or jumping, can cause displacement of minor and major organs of the body; or excessive mental or physical effort can cause disease.
7. *Grief and sorrow*. When people suffer from adversity, normally they grieve and are sad, and they withdraw from enjoying themselves. They even lose interest in food, or refuse to eat. For example—they are so sad that they forget to eat and sleep. When this is the case, the clear fluid which nourishes the heart becomes cloudy and dries up, which can cause disease.

48. These three-hourly periods of time correspond to the watches which used to be announced in Thailand by the striking of a gong. They were also observed in India.

8. *Violent temper.* People who are always bad tempered, so that they cannot control themselves, tend to display behaviour which is antagonistic to both mind and body, and they neglect their bodies, or even do themselves physical harm. In such cases, illness can be caused.

This is in accordance with Buddhism, which teaches that sorrow arises from man's emotional attachment to worldly things. The stopping of sorrow leads to enlightenment, and this is achieved by following the Middle Way, the path of moderation. Disease is a form of sorrow, and immoderate behaviour is considered to be a cause of disease.⁴⁹

Thus, the ultimate causes of disease are considered to be the *tri-doṣa*, wind, bile, and mucus, which are vitiated by abnormalities of the body elements. In practice, the blood is also included. This probably results from a growing understanding of the circulatory system (refer to the fifth component of *wāyōthāt* quoted from Matthayat, and his comment that blood used to be called *lom*). However, blood has not replaced wind entirely, as air or wind still occurs with blood, bile, and mucus as one of the final causes of disease which are aggravated by disorders of the elements. These disorders occur independently, or as the result of changes in climate and environment, the time of life and the time of day, or as the result of behaviour which deviates from normal moderate practice.

The diagnosis of disease⁵⁰

The four main principles in the diagnosis of disease are :

1. Investigation of the history of the patient and his family.
2. Investigation of the past and present history of the disease.
3. Examination of body and mind.
4. Investigation of the symptoms—taking the temperature—taking the pulse—examining the faeces and urine — examining wounds or visible deformities.

1. *The history of the patient.*

- (i) His name, to be recorded.
- (ii) Place of residence, to establish the cause due to place.
- (iii) Nationality, beliefs, and habits.
- (iv) Place of birth, to establish the cause due to place.
- (v) Age, to establish the cause due to age.
- (vi) Occupation.
- (vii) Family history. (Enquire about parents, children, wife or husband).
- (viii) Habits. (Smoking opium, drinking alcohol, and other habits?)
- (ix) Symptoms of previous illnesses.

2. *Investigation of the history of the disease, (both past and present).*

- (i) When he fell ill. To establish the causes due to time, season, and age.
- (ii) How he became ill.
- (iii) The first symptoms.
- (iv) The order in which the symptoms presented.
- (v) Previous treatment.
- (vi) The way the symptoms have developed.
- (vii) Daily symptoms of the disease.
- (viii) Symptoms obvious at the time of diagnosis, and the doctor's opinion.

3. *The physical examination.*

- (i) Type of physique.
- (ii) Strength.
- (iii) State of mental health.
- (iv) Patient's complaints.
- (v) Action of the pulse.

49. A.L. Basham, pp. 268-9.

50. Matthayat, pp. 25-28.

- (vi) Breathing.
- (vii) The heart
- (viii) The lungs.
- (ix) The tongue.
- (x) The eyes.
- (xi) The complexion.
- (xii) Make a close inspection for the affected parts

4. *Investigate the symptoms.*

- (i) Take the temperature.
- (ii) Examine the perspiration.
- (iii) The faeces.
- (iv) The urine.
- (v) Investigate the patient's diet.
- (vi) The voice.
- (vii) How he is sleeping.
- (viii) Condition of the mouth and throat.
- (ix) Condition of the exterior of the body.

When you have completed your examination satisfactorily, decide :

- (i) The symptoms, the type of disease, and its name.
- (ii) The primary cause of the disease.
- (iii) The way to treat this disease in order to cure it.
- (iv) The kind of drugs which will counteract this disease.

Systematic analysis of observations

1. *Examine the results.* When you have examined the symptoms of the disease, and understood them clearly, analyse what you have observed, and treat as follows:

- (i) Which cause and which *phikat* พิภักดิ์ (class or group of drugs) are indicated by the patient symptoms?
- (ii) Which cause and which *phikat* are indicated by the patient's place of birth?
- (iii) Which cause and which *phikat* are indicated by the patient's age?
- (iv) Which cause and which *phikat* are indicated by the season at the time of the illness?
- (v) What is the cause of the progress of the disease since its onset?

Then conclude what is abnormal, and the name of the disease.

2. *Find the primary cause.* Having made these investigations, use the symptoms you have observed to analyse the cause of the disease, that is, what is deficient, what is excessive, or what is in conflict; thus establish the reason for the occurrence of the abnormality.

3. *Find the way to treat the illness.* Having decided how to treat the disease, you must select which drugs are to be used for treatment, and the dosage and frequency; then prescribe medicine according to the symptoms of the disease.

4. *The treatment of disease*

- (i) Treatment by means of medicine.
- (ii) Treatment by means of surgery.⁵¹
- (iii) Treatment by means of massage.
- (iv) Treatment by means of magic spells and incantations.

Thai traditional pharmacy

Unfortunately, limitations of time and space prevent the inclusion in this paper of a discussion of treatment by surgery, massage, and magic spells and incantations, important though they may be. Even the treatment of disease by medicine can only be touched on here, as this in itself covers an enormous field of study.

Superficially, Thai traditional pharmacy appears to be quite similar to Western pharmacy, as it was practised up to the middle of this century, when manufactured synthetic drugs inexorably replaced the now old-fashioned tinctures and infusions, syrups and elixirs, and hand-made pills, powders, and suppositories prepared *secundum artem*, and not without a

51. No surgery at all was practised formerly, but some traditional doctors now perform very minor surgery such as the lancing of abscesses.

certain amount of pride and mystery, in the inner sanctums of chemists' and druggists' establishments. The two systems had much in common, but, on close investigation, it can be seen that the parting of the ways took place at a very early date.

As becomes increasingly apparent in the study of ancient medical systems, most writers of medical texts endeavour to show how their knowledge was built on foundations laid in an age of great enlightenment, far in the distant past. The authenticity and authority of the work can thus be appreciated, with great benefit to all concerned. Thai medicine has such traditions. In the foreword to *Tamrā phēsatchakam Thai phāen bōrān*, Prasōet Phrom-manī writes

... the subject of traditional medicine comes from the time of the Buddha, through Mō Rōkāmāru-tin⁵² and Mō Chīwaka Kōmārāphat, who was the personal doctor of King Phimphisān and of the Lord Buddha himself. Is this fact that this subject of traditional medicine was an ancient science not sufficient evidence for you to be interested?

In fact no writings of Jivaka survive, and he is only remembered in Buddhist tradition.

In addition to the general belief that Jivaka is the great teacher of medicine, the following story of six *ṛṣis* who made important discoveries of drugs has been preserved in the texts, adding weight to the tradition that this is a very ancient medical system. There were once six *ṛṣis*, Papphatang (ปัพพะตัง), Utthā (อุทธา), Bupphathēwā (บุพเพทา), Buppharatta (บุพพรัต), Mahithikam (มหิททิกกรรม), and Murathāthōn (มูรธาธร), who searched for medicines to help mankind in the treatment of disease. They did not have to experiment on other animals, because they tested the drugs they found on themselves. Each of the first five *ṛṣis* discovered a drug and its uses in treatment. The first discovered *dōk dī plī* (ดอกดีปลี), or *phon dī plī* (ผลดีปลี), the flowers of fruit of Chab pepper, or of Long pepper, which relieves or suppresses incurable diseases. The second *ṛṣi* found *rāk chāphlū* (รากชะพลู), the root of the wild betel leaf bush, for muscular aches and pains; the third, *thao sakhān* (เถาสะข้าน), the stem of a species of wild pepper vine, for the relief or suppression of mucus and wind or air; the fourth discovered *rak chettamūnphlōeng* (รากเจตมูลเพลิง), *Plumbago* root, for diseases arising from bile, which can cause symptoms of feeling cool or cold; and the fifth *ṛṣi* discovered *ngao khing hāeng* (เหง้าขิงแห้ง), dried ginger root, for treatment of diseases arising from the *tri doṣa*. But the most important of all was the *ṛṣi* Murathāthōn, who mixed equal parts of all these five drugs. He called the mixture *bēnchakun* (เบญจกุกูล: the five spices). Medicine prepared from this mixture gives relief from, or suppress diseases arising from any of the thirty two parts of the body,⁵³ and will also improve the appetite and sleep by its action on the four body *thāt*.⁵⁴

Another legend tells of four *ṛṣis*, Nārot (นารท), Nalai (นาไลย), Tāfai (ตาไฟ), and Tāwūa (ตาวัว), who discovered four drugs which prolong life and prevent premature aging. These constitute, perhaps, the Thai elixir of life. An infusion is made of one part of each of the four drugs—*bai nāt* (ใบหนาด), Ngai Camphor leaves; *thao bōraphēt* (เถาบอระเพ็ด), *Tinospora* vine; *bai matūm* (ใบมะตูม), leaves of the Bael of Bengal quince; and *bai phak khrāt* (ใบผักคราด),

52. The teacher of Jivaka Kōmārābhacca, in this passage spelled "Chīwaka Kōmārāphat".

53. According to Buddhist teaching, there are 32 parts of the body. The Buddhist origins of this story are also apparent in the statement that the *ṛṣis* did not have to experiment on animals.

54. Prasōet and Parinyā, p. 3.

leaves of Para Cress—by crushing them and macerating each drug separately in one *thanān* (litre) of water. The four resulting infusions are then mixed together, and reduced to one *thanān* by heating in a cauldron. This preparation is kept for one month in a glazed, earthenware pot, sealed with earth impregnated with resin. It is then ready to be taken to cure all diseases. When it has been kept for three months, it is taken to prolong life, strengthen the body, and prevent premature aging. Two tablespoonfuls are taken morning and night, before meals. “Each time before the medicine is prepared or taken, let the names of the four *r̥sis* be repeated or recalled to mind, and the medicine will have miraculous power.”⁵⁵

Most Thais still believe in spirits. An instance of this is the practice of placing a small bamboo *chalēo* (เชลว) ⁵⁶ in an upright position on top of a pot of medicine before it is handed, to the patient. This is designed to prevent the spirit Phāetthayāthōn (แพททยาธร), from tasting the medicine first, and in so doing, depriving it of its ‘taste’, that is, its potency, before the patient takes it.

Religion, magic, and medicine are closely associated, and the magico-religious aspect of Thai medicine plays a strong part when other treatments fail. At such times offerings are made to the spirits of the land (Phra Phūm). If medicine cannot cure them, some people ‘*bon*’ (บน), i.e. they make vows promising Phra Phūm that if they recover they will offer such things as garlands of flowers, carved wooden elephants, or a performance of dancing as a thank-offering. One of the modern textbooks on pharmacy explains the correct names of the earth spirits, so that if the right name is given the spirit will accept the offering, and happiness and prosperity will follow.⁵⁷

The principles of pharmacy. The drugs of Asia have always attracted the European, not only for their fragrance and flavour, but more importantly, for their renowned healing powers.⁵⁸ From the Bible we learn the romantic names of Asian drugs such as frankincense and myrrh, saffron and cinnamon, balms and ointments. The spice trade from Southeast Asia, which had such far-reaching economic, political, and social effects on the whole area for centuries, grew in response to an enormous demand for pepper, nutmeg, cloves, and other exotic products, many of which had medicinal use. The records of early trade with Thailand include exports of sappanwood, camphor, eaglewood, areca, sticklac, and benjamin, indigo, pepper, cardamoms and cocoanut oil. In more recent years, modern medicine has benefitted from the addition to its pharmacopoeias of such potent and effective drugs as *Rauwolfia serpentina*, which is found and used medicinally in India, Ceylon, Java, and in Thailand, where it is known as *rayōm*. No doubt there is much more to be learnt from Thai materia medica, which would beto the advantage of modern medicine.

Properties of drugs. The Thai traditional pharmacist identifies a drug by its appearance, colour, smell, taste and name, but the taste determines its use. “To know the properties of

55. *Ibid.*, p.4. It is auspicious to think of the teachers.

56. A *chalēo* is a device made by folding and crossing thin bamboo strips to form a five or six-pointed figure, having open spaces between the slats.

57. Prasōet and Parinyā, *Tamrā phēsatchakam* . . . , p. 5.

58. A distinction cannot always be made between food and drugs. In many instances a substance might be used as both.

a drug, the taste must first be known, because the taste of the drug will indicate its properties."⁵⁹ For the purpose of Thai pharmacy, the properties of drugs refer to their properties in the treatment of disease, rather than their physical properties in isolation. Of course, when the use of drugs is decided according to taste, experience shows that there are exceptions, and these are taken into account by the Thai traditional system.

For the modern pharmacist, the physical properties of drugs serve as guides to identification. In determining their use in the treatment of disease, Europeans relied entirely on empiricism—trial and error—until scientific knowledge made it possible to predict the potential effects of the use of many drugs through laboratory testing before their use is tested on humans. But even so, with the development of synthetic drugs, sometimes designed to serve a specific purpose, their ultimate use is determined by experience resulting from clinical trials.

Taste. In the Thai system there are three principal tastes: hot, cool and mild; and nine medicinal tastes: astringent, sweet, *mao bñā* (เมาเปรี้ยว), bitter, hot and spicy, cool and fragrant, salty, and sour. There is also a bland taste.

The three principal tastes: hot-tasting drugs, or drugs which when mixed have a hot taste, such as *malēt phrikthai* (เมล็ดพริกไทย: peppercons), and *khing* (ขิง: ginger), are used in the treatment of diseases due to the element air, such as *lom čhuk siat* (ลมจุกเสียด).⁶⁰ They also nourish the *thāt*, and counteract toxic fevers.

Cool-tasting drugs are those such as plant, animal and mineral substances which when mixed, or after being burnt to ashes, have a cool taste. These include those leaves, pollens, flowers, bones, teeth, horns, antlers and tusks which have a cool taste. They are used in the treatment of diseases caused by the element fire, such as toxic fevers, and to subdue the heat of poisons, and for diseases due to *lom*.

Mild-tasting drugs, such as *kralāmphak* (กระลำพัก: milk-hedge), and *opchōei* (อบเชย: cinnamon), are used in the treatment of diseases due to the element water, when disorders of the blood and of mucus occur; to treat diseases due to air; and to nourish the heart and counteract toxic fevers.

The nine medicinal tastes of drugs

These are given by Matthayat as follows:

1. *The astringent taste* has properties to close wounds, heal and protect the *thāt*, to treat diarrhoea and dysentery, and to counteract constipation.
2. *The sweet taste* has properties of permeating and moistening the flesh, providing energy, treating exhaustion, counteracting diseases due to increased mucus, and treating cuts and wounds.
3. *The mao bñā taste* has antitoxic properties, and is used to treat poisoning of the bile, blood, and mucus, poisoning due to bites of venomous animals, an toxic fevers, and to counteract heart diseases of the bile.
4. *The bitter taste* has properties to nourish the blood and bile, to treat fevers due to bile and abnormalities of the blood, to improve the appetite, and to counteract heart disease.

59. Matthayat, pp. 22, 310-316.

60. *Lom čhuk siat*, *lom čhuk*: a condition of extreme flatulency producing epigastric pain and impaired respiration.

5. *The hot and spicy taste* has properties to treat *lom*, *lom chuck siat*, indigestion, and passing wind; to nourish the *thāt*, and to counteract toxic fevers.

6. *The oily taste* has properties to treat abnormalities of the tendons, to nourish the tendons, to enrich the body fats so as to provide warmth to the body, and to counteract mucus disorders.

7. *The cool and fragrant taste* has refreshing properties, nourishes the heart and womb, and counteracts diseases due to air.

8. *The salty taste* has properties of permeating the skin, treating skin diseases, preserving the condition of the skin, and counteracting diseases of the bowels, and abnormal *thāt*.

9. *The sour taste* has properties of treating mucus, cleansing the blood, loosening the bowels, counteracting jaundice, and treating cuts, wounds, and diarrhoea.

In addition, *the bland taste* is to treat diseases due to the element fire, and is diuretic.

Drug tastes are also classified for use in treatment according to the cause of the disease, whether it results from the effects of the elements, the seasons, age, or time.

In addition to the system of classifying tastes adopted for general use in Thai traditional medicine, three other systems are mentioned in the texts, showing a variety of sources for this medical system. According to *phrakhamphī yōkkhasān* (พระคัมภีร์โยคसार) there are six tastes: *matthura* (มธุระ : sweet), *amphira* (อัมพีระ : sour), *lawana* (ลวะนะ : salty), *kotuk* (กฏุก : spicy), *tittikā* (ติตติกะ : bitter), and *kāsāwa* (กาสาวะ : astringent). According to *phrakhamphī thātwiwōn* (พระคัมภีร์ธาตุวิวรรณ) there are eight tastes: bitter, astringent, salty, hot and spicy, sweet, sour, cool and fragrant, and oily. And according to *khamphī thātwhiphang* (คัมภีร์ธาตุวิภังค์) there are four tastes used in the treatment of disease: astringent, spicy, salty and sour.

In actual practice, it is experience which determines the type of taste to be used. Sweet-tasting drugs are used to retain moisture, and to give strength and energy; astringent-tasting drugs, which usually contain tannins, for diarrhoea; *mao bhā*, to counteract poisoning; bitter for thirstiness and as a bile tonic; hot and spicy, as a carminative; oily-tasting drugs are given as a 'tonic' for the joints, and to give warmth; cool and fragrant, as a heart tonic; salty, for skin rashes; and sour-tasting drugs are used as expectorants. The last are considered effective in the same way as ascorbic acid (vitamin C), and are also used a mild laxative. The bland-tasting drugs are used as diuretics, and as antipyretics for fever.⁶¹

Taste, as an important factor in determining the use of drugs, is a feature of both the Chinese and the Āyurvedic medical systems, but in neither of these is the classification the same as in Thai medicine. In keeping with their system of correspondences in groups of five, such as five elements, colours, climates and directions, the Chinese have five tastes: bitter, sour sweet, pungent and salt.⁶² The *Caraka Saṃhitā* contains a lengthy discussion on the number of tastes, what they are, and their combinations, and concludes that there are six: sweet, sour, salt, pungent, bitter and astringent. In their action on the *tri-doṣa*, the sweet, acid and salt tastes

61. Āchān Prasōet Phrom-maṇī, lecturer at the College of Traditional Medicine, Wat Mahāthāt, Bangkok. Personal communication, 19 December 1976.

62. Wong and Wu, p. 20.

subdue *vāta*; the astringent, sweet and bitter subdue *pitta*; and the astringent, pungent and bitter subdue *kapha*. *Vāta* is provoked by the pungent, bitter and astringent tastes; *pitta* by the pungent, acid and salt; and *kapha* by the sweet, acid and salt tastes.⁶³

In this area of the provocation or aggravation of the *tri-doṣa*, the Thai system has tenuous links with the classical Āyurvedic system. Except that the Thais substitute spicy for pungent, and we have used sour for acid the same tastes are used to provoke the wind, bile and mucus.

*The classification of drugs*⁶⁴

In addition to classification by taste, drugs are grouped into three classes called *phikat yā* (พิกัดยา). They are the Small, Large, and Great Classes: *čhunlaphikat* (จุลพิกัด), *phikat yā* (พิกัดยา), and *mahāphikat* (มหาพิกัด), respectively. The purpose of this classification is to overcome difficulties which arise when two or more drugs are very similar, and to simplify prescribing and measuring procedures.

The Small Class groups drugs of similar name which are for the most part the same, but which have variations in qualities such as shape, colour, smell and taste. For example, sweet lemon and sour lemon, yellow sulphur and red sulphur. This class contains drugs the tastes of which are not incompatible, drugs which have equivalent properties, or drugs which help preserve the properties of most other drugs.

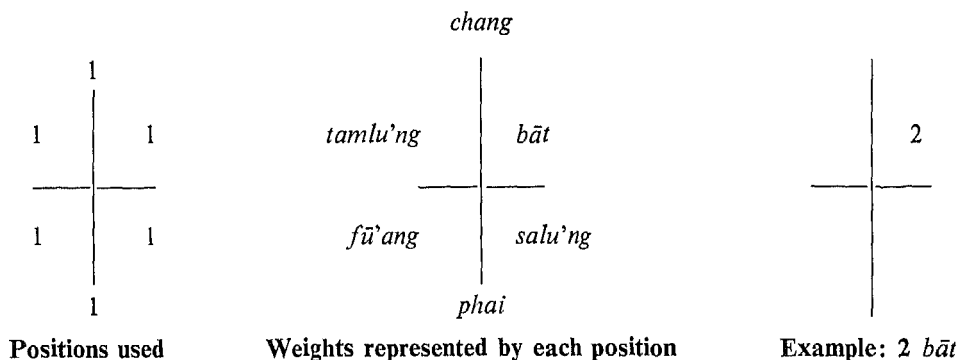
The Large Class groups together equal portions and weights of several drugs under one name. For example, *phikat bēnčhakūn* (พิกัดเบญจกูล) contains one part of each of Chab pepper, root of the wild betel leaf bush, stem of wild pepper vine, *Plumbago* root, and ginger root. That is, five drugs of equal weight, so that the prescriber has only to write '*phikat bēnčhakūn*' to order equal portions of each of these five. Other groups may contain as many as nine or more drugs, so the advantage is obvious.

The Great Class groups several drugs under one name, but in different proportions. These are used to make special compounds to treat aggravations, deficiencies, and abnormalities of the *thāi*, and complications and secondary diseases following these. For example, *mahāphikat*, *bēnčhakūn* contains the same drugs as *phikat bēnčhakūn*, but in different proportions—20, 12, 6, 4, and 10 parts respectively.

A very convenient method of writing quantities is used. Two intersecting lines are drawn, and a figure is placed in one of six positions on the diagram. The position of the figure indicates whether it represents *chang* (ชั่ง), *tamlu'ng* (ตำลึง), *bāt* (บาท), *fū'ang* (เฟื้อง), *salu'ng* (สลึง), or *phai* (ไพ) in descending order on the diagram, and the figure gives the quantity of that weight.

63. Caraka, vol. V, pp. 6, 161.

64. Matthayat, pp. 317-318.



N.B. : The Thai system of weights and measures used in dispensing is as follows.

| | | |
|--------------------|---|---------------------------------------|
| 2 <i>lot</i> (พด) | = | 1 <i>at</i> (อัฐ) |
| 2 <i>at</i> | = | 1 <i>phai</i> (ไพ) |
| 4 <i>phai</i> | = | 1 <i>fũ'ang</i> (เฟื้อง) |
| 2 <i>fũ'ang</i> | = | 1 <i>salu'ng</i> (สลึง) |
| 4 <i>salu'ng</i> | = | 1 <i>bāt</i> (บาท) = approx. 15 grams |
| 4 <i>bāt</i> | = | 1 <i>tamlu'ng</i> (ตำลึง) |
| 20 <i>tamlu'ng</i> | = | 1 <i>chang</i> (ชั่ง or ชั่งไทย) |
| 50 <i>chang</i> | = | 1 <i>hāp</i> (หาบ) |

From this brief outline a general understanding of Thai traditional pharmacy can be gained. The drugs are usually used in their crude state, in quantities and combinations found from centuries of experience to be effective as medicine. Their taste is taken as a guide to determining their possible medicinal action, and this appears to be quite a simple and effective method in its actual application. The system of drug classification is also simple and effective. The Small Class, comprising groups of drugs which have only slight and unimportant differences, helps people to know which substance may be used in place of another. The Large Class groups together standard combinations of equal parts of the constituent ingredients in order to simplify prescribing procedures. The Great Class also groups standard combinations, but in varying quantities, to be used for special purposes.

This system indicates a rigidity in prescribing born of long experience in the use of the same drugs, with little innovation, which bears out the claim that Thai medicine is an ancient art. Psychologically, it is good medicine, because the preservation of the traditions of its legendary founders, backed by its long association with Buddhism, enhances the authority of its practitioners, and the healing powers of their drugs.

Conclusion : a tradition with new prospects

Thai traditional medicine is a very ancient system of medicine. It was based on knowledge transmitted orally from teacher to pupil until such time as it was committed to writing in the

Pali language and Khmer script on palm-leaf manuscripts. These manuscripts were later translated into Thai, and preserved as sacred texts handed down in their original form to succeeding generations. The tradition of preserving the ancient texts is still observed.

It is a simple system of medicine based primarily on the philosophy of *Āyurveda*, the science of life of ancient India which had its beginnings during the same few centuries as the ancient medical systems of Greece and China, about 2,500 years ago. *Āyurveda* relates the human body and its elements to the macrocosm of the universe; as such it does not adopt a scientific approach to the diagnosis and treatment of disease. It views the body as a co-ordinated whole, classified, not according to function, but according to its constituent components. The material components of the body are classified with reference to the predominant element of the four protoelements of which they are composed.

Consequently, in Thai traditional medicine, disease is seen as a disturbance of the balance of these elements, manifested by disorders of the various component substances of the body. Such disorders may arise from endogenous causes, or from exogenous causes, such as changes in climate or environment, and factors of age and time of day. Immoderate behaviour of the individual is also taken into account as a causal factor of disease. Whatever may be the primary cause, the result is thought to produce changes in the function or structure of one or more of three vital constituents of the body: wind, bile and mucus. These disorders of the *tri-doṣa* are considered to be the ultimate causes of disease.

Disease is diagnosed after a thorough investigation of the history of the patient and his family, the past and present history of the disease, examination of body and mind, and investigation of the patient's symptoms. From the information thus obtained, the primary cause of the disease is decided, the name of the disease, and its treatment. Treatment may be given by means of medicine, very minor surgery, massage, or by magic spells and incantations. Only treatment by medicine has been described here. Crude drugs of plant, animal, and mineal origin are used, usually in standard combinations and quantities. The medicinal properties of drugs are determined by their taste.

How can such an unscientific system be effective—which it must be to have persisted for centuries, and to have commanded the adherence of so many people? Let us look at the actual practice of Thai traditional medicine, and see what would happen in an imaginary case.

A patient of a certain age, resident in a particular place, with known habits and behaviour pattern, who became ill at a known time of day or night and time of year, presents himself with certain symptoms. The causal factors due to the patient's symptoms, place of birth, age, the time of the onset of the disease, and the primary cause are determined. A conclusion is reached on what is abnormal, and the disease is named. Let us say the disease is called X. But the cause and the name, although useful psychologically, are irrelevant medically. The medicine prescribed for treatment is selected according to the symptoms.

In actual treatment, experience has shown that a combination of certain drugs is effective in the relief of certain symptoms, and these are then given. If it is a minor complaint, easily treated, the patient recovers in a reasonable time, and is fully satisfied by the treatment. As

most illnesses fit into this category, the results, on the whole, are very good. In the case of serious or potentially fatal illnesses, some of the drugs must surely be effective. Only many years of study of the action of traditional medicines will reveal which these are. At the present time, research is being conducted at hospitals and research institutes in Thailand into these drugs, particularly to determine the safety of the use of some which may be dangerous.

Ayurvedic medicine takes a quite practical view of incurable diseases. Doctors are advised not to treat such cases. But it seems that, although the Thai *mā bōrān* does not attempt to treat incurable diseases, he does offer to try to suppress or alleviate the symptoms, in order to make his patients more comfortable. This is apparent in the continued use of the five drugs discovered by the six legendary *ṛsis*, the first of which drugs is said to have these powers. It is also apparent in the actions of people who consult the traditional doctors when modern medicine has failed them.

For most medical purposes, therefore, this traditional system is adequate. In addition, it is inexpensive: the drugs are cheap, little equipment is needed, and practitioners can be trained quickly and at little cost. Another great advantage it holds over modern medicine is its humanity. Each person is treated as an individual. His personal differences, his private life, his habits, and his behaviour are clearly given understanding consideration, and he is given a reason for his illness, which for him is valid, because of his cultural background, his religious beliefs, and his education. It is easy to explain to someone who has been brought up in a community which understands the traditional view of the functions of the body in relation to the environment that he is suffering from *lom*, and that it was caused by the unseasonable weather, or by his inadequate diet. It is equally impossible to explain to him that he has a virus, when his mental picture of the functions of the body is unable to accommodate such an idea.

This system of medicine is used in Thailand to a much greater extent than modern medicine, which is quite well established in the cities and urban areas, but does not reach the majority of the people, who live in the rural areas. Even where modern medicine is available, many people, including some trained in the modern health professions, patronize the traditional doctors. As the most practical means of providing universal elementary health care in rural areas, the World Health Organization has decided to train 'village health volunteers' and 'village communicators' in Thai traditional medicine.

ANNEX

List of texts on medicine published in *Phāetthayasāt songkhro* (แพทยศาสตร์สงเคราะห์ : The Study of Medicine), vols. I, II, and III, together with a summary of their contents.

Volume I

1. *Phrakhamphī chanthasāt* (พระคัมภีร์จันทศาสตร์)
Eight rules of medical ethics, *rōksāng* (โรคซาง : the causes of fever, dysentery and prognosis of death).

2. *Phrakhamphī prathomčhindā* (พระคัมภีร์ปฐมจินดา)
The first Brahmin *purohitas* of the first era, conception, menstruation, the causes of diseases in infants and medicine to treat them.
3. *Phrakhamphī thāt wiphang* (พระคัมภีร์ธาตุวิงศ์)
Abnormalities of the *thāt* (ธาตุ) according to the seasons.
4. *Phrakhamphī sapphakhun (lae mahāphikat)* [พระคัมภีร์สรรพคุณ (และมหาพิกัต)]
The properties of drugs.

Volume II

1. *Phrakhamphī samutthānwinitchai* (พระคัมภีร์สมุฏฐานวินิจฉัย)
The search for the cause and origin of disease.
(A simpler version of this text is given in volume III.)
2. *Phrakhamphī warayōkhasān* (พระคัมภีร์วารโยคสาร)
This is probably the same as *Phrakhamphī yōkhasān (phāetthayā langka)* of Amṛṇsēk Mahā-ammāt [พระคัมภีร์โยคสาร (แพทยาลังกา) ของอมรเสกมหาอำมาตย์]
The taste of drugs, and the characteristics of good and bad omens.
3. *Phrakhamphī mahāchōtarat* of Phra-āčhān Thāwsahamobodī Phrom (พระคัมภีร์มหาโชตรัต ของพระอาจารย์ท้าวสหมบตีพรหม)
Menstruation.
4. *Phrakhamphī chawadān* (พระคัมภีร์ชาวดาร)
Food poisoning causing *lom* to aggravate the blood.
5. *Phrakhamphī rōknithān* of Phra-āčhān Kōmāraphat (พระคัมภีร์โรคนิตาน ของพระอาจารย์ โทมารภัก)
The four *thāt* when in excess or deficiency.
6. *Phrakhamphī thātwiwōn* (พระคัมภีร์ธาตุวิวัฒน์)
The four *thāt* and menstruation.
7. *Phrakhamphī thātbančhop* of Phra-āčhān Kōmāraphat (พระคัมภีร์ธาตุบรรจบ ของพระอาจารย์ โทมารภัก)
Diseases of the bowel caused by the *thāt*.
8. *Phrakhamphī mutchāpakkanthā* (or *mutchapakkanthikā*) [พระคัมภีร์มูฉานปักขันททา (มูฉานปักขันทิกา)]
Diseases of the urinary tract, and leucorrhoea.
9. *Phrakhamphī Takkasilā* (พระคัมภีร์ตักกะสีลา ตักกสีลา)
Complete description of all toxic fevers.
10. *Phrakhamphī krasai (kasai)* [พระคัมภีร์กระษัย (กษัย)]
Discussion of *rōk krasai*, a group of diseases of vague causation but producing general weakness and emaciation; 26 types.

Volume III

1. *Phrakhamphī aphayasantā* (พระคัมภีร์อภัยสันตา)
The origin of fevers and all types of *sāng*, and diseases of the eye.

2. *Phrakhamphī samutthānwinitchai* (พระคัมภีร์สมุฏฐานวินิจฉัย)
See volume II, 1.
3. *Phrakhamphī mānchusarawichān* (พระคัมภีร์มัญชุสวาระวิเชียร)
Diseases of *lom*, ten types.
4. *Phrakhamphī utthararōk* (พระคัมภีร์อุทรโรค)
Diseases of *thōng mǎn* (ท้องมาน : dropsy affecting the abdominal cavity).
5. *Phrakhamphī mukkhārōk* (พระคัมภีร์มขโรค)
Diseases of the mouth and throat, 19 types.
6. *Prakhamphī sitthisārasongkhro* (พระคัมภีร์สิทธิสาระสงเคราะห์)
A disease called *lambōng rāhū* (ลำบองราหู) which produces a rash associated with toxic fever, or toxic inflammation.
7. *Phrakhamphī phaichitmahāwong* (พระคัมภีร์ไพจิตรมหาวงศ์)
Abscesses, boils, and pustules.
8. *Phrakhamphī thipphamālā* (พระคัมภีร์ทิพพมาลา)
Tuberculosis.
9. *Phrakhamphī withikuttahārōk* (พระคัมภีร์วิถิกุฏฐโรค)
Leprosy.

Other texts mentioned in *History of the Texts on Medicine*, and probably included in other texts as indicated.

1. *Phrakhamphī atisān* (พระคัมภีร์อติสาร)
Dysentery. (See volume I, 1.)
2. *Phrakhamphī cchalanasangkha* (พระคัมภีร์จะละนะสังคหะ)
Diseases of the bowel caused by the *thāt*, four types. (See volume II, 7.)
3. *Phrakhamphī wārayōkhasān* (พระคัมภีร์วารโยคสาร)
This is similar to *warayōkhasān* (วรโยคสาร). (See volume II, 2.)
4. *Phrakhamphī thāt aphinayān* (พระคัมภีร์ธาตอภินญาณ)
Three diseases arising from the four *thāt* (See volume III, 1.)

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