

Pancreas Known by the Chinese in the Middle Ages!

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I

Regner de GRAAF, Holland, was the first to study the pancreas and its secretions (1664). The description of the pancreas (1316) by MONDINO, Restorer of Anatomy, is very obscure and even in the fifth book of the *Fabrica* written by VESALIUS in 1543 pancreas is regarded as several glands (glandular bodies) but not as a single organ.

In Asia, there have long been used the terms of *wu-tsang*^a (five viscera, *i.e.* the heart, the liver, the spleen, the lungs and the kidneys) *liu-fu*^b (six bowels, *i.e.* the small intestines, the gall-bladder, the stomach, the lower intestines, the bladder and the *san-chiao*^c), but neither term contains pancreas. It was usual in medieval Chinese works on anatomy that the pancreas and nervous system were ignored. This, however, does not mean that Chinese had no knowledge of the pancreas at all. We should start with a brief review of the historical background in China and Japan on the basis of which studies on pancreas as an organ has been developed.

II

In Japan, it seems that KURIYAMA Koan^d, one of the pioneers of human dissection, was the first who observed pancreas on the dissection of a woman's body on May 21, 1759, in his native town, Hagi^e. He did not regard it as a normal organ but he thought it a clot of blood and pus near intestines and stomach¹.

In the *Kaitai Shinsho*^f, the "New Work on Anatomy", published in 1774, SUGITA Genpaku^g introduced the pancreas as one of internal organs on which Chinese had given no description or explanation at all. He translated the Dutch *alveesklier* into the Japanese term *takiriiru*^h which was synthesized by a Japanese

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word *ta* meaning large and *kiriiru* a Japanese phonetical equivalent of Dutch klier(gland). The modern term *suizô*ⁱ, which literally means the organ gathered follicles, was first used by UDAGAWA Shinsai^j, one of SUGITA's followers, in 1805.

III

China was much slower to accept Western medicine in spite of the Jesuits' earlier efforts to introduce modern anatomy into China. Chinese lethargy in medical field stood in sharp contrast to Japanese activities inspired by Dutch medicine. Although Dr. Benjamin HOBSON, a London Missionary Physician, applied the term *thien-jou*^k (sweet flesh) to pancreas in Chapter 19 of the *Chhüan-thi hsin-lun*^l, the "New Work on Whole Body", published in Canton in 1851, at present day it is called *i-tsang*^m.

It is noticed that, in Chapter 4 of the *I-lin kai-tsho*ⁿ, the "Correction of Medical Faults", published in 1830, WANG Chhing-jen^o says that the common name of the *tshung-thi*^p (pancreas) is *i-tse*^q. Nowadays *i-tse* means soap, but, until soap was first imported in China, *i-tse* probably meant the pancreas of the domestic animals. If it be so, when did Chinese begin to make use of the pancreas for wash?

First, the descriptions we find are as the medical toiletry. In Chapter 52 of the *Chou-hou pei-chü fang*^r, the "Prescriptions for Emergencies at Hand", written by KO Hung^s (283-ca.343), there are three kinds of the beauty wash in which included the pancreas of a hog (*chu-i*^t) though the pancreas is no basal constituent of the prescriptions. These medicines for external application gradually developed to thirteen varieties, in which pancreas of sheep was employed also. These varieties are described in Chapter 6 of the *Chhien-chin yao-fang*^u, the "Prescriptions Worth a Thousand" (650/659), and more than half of them are quoted in Chapter 32 of the *Wai-thai pi-yao fang*^v, the "Arcane Essentials from the Outer Tribunal" (752). These, however, were supplied in forms of not only beauty wash but also washing powder (*tsao-tou*^w) and toilet ointment (*mien-chih* or *mien-kao*^x).

Secondary application of the pancreas is found in the medicine for cough. There are two prescriptions, in both of which main constituent are the pancreas of hog, in Chapter 23 of the *Chou-hou pei-chü fang* written by KO Hung. We read:

Prescription for a patient had sudden attack of cough.

Pancreas of a hog.

Cut in slice, boil it in vinegar and eat entirely but don't take over two doses.

Prescription for a patient suffering from lingering cough and dizziness, in spite of therapy with medicines for such a long period of time as ten or twenty years.

Three pieces of total pancreas of hogs.

Hundred dates of Jujube.

These two ingredients are extracted with three *sheng*^y (ca.600cc) of *sake* wine for several days. Drink two or three *ho*^z (ca. 40-60 cc) of the extract and then gradually increase the amount to four of five *ho* (ca. 80-100 cc). If you do so, you will soon recover.

There seems to be substantially no doubt that the latter of the prescriptions was popular in the Thang period, because the latter is quoted in Chapter 17 of the *Chhien-chin yao-fang* and also in Chapter 10 of the *Wai-thai pi-yao fang*.

IV

It is just and reasonable that the above two applications were reflected in the pharmacology at that time. In Chapter 18, Section 'Hog' of the *Cheng-lei pen-tshao*^{aa}, the "Classified Pharmacopoeia", compiled by THANG Shen-wei^{ab} in about 1082, there are the descriptions quoted from the *Chou-hou pei-chü fang*, the *Pen-tshao shih-i*^{ac}, the "Supplemented Pharmacopoeia", written by CHEN Tsang-chhi^{ad} in 739, and so on.

The anatomical explanation of the pancreas of hog is in Chapter 50, Section 'Hog' of the *Pen-tshao kang-mu*^{ae}, the "Great Pharmacopoeia", published in 1596. We read:

It is in the middle of kidneys and looks like hog-fat but not hog-fat and also looks like pork but not pork. Stating this about the body of human being, the location correspondends to the ming-men^{af} (the acupuncture point between the kidneys) from where the *san-chiao* appears.

LI Shih-chen's^{ag} description mentioned in the above is still obscure². In general, the *san-chiao* (three burning spaces) was considered as the organ showing such a physiological function that the disorder of which resulted in a diabetes

(*hsiao-khe^{ah}*) under certain circumstances, but being of invisible form. Chinese anatomists, indeed, failed to make sure of the *san-chiao* on the human dissections neither in 1045 nor in the Chhung-ning^{ai} era (1102-1107)³. It is sure that practical knowledge of butcher had not been sufficiently reflected in the anatomical works or *materia medica*.

V

Other applications are read in the works of the traditional Chinese technology written in the Ming^{aj} period.

The pancreas of hogs were used for the washing off the gum from raw silk. These technical descriptions are in Chapter 2 of the *Thien-kung khai-wu^{ak}*, the "Creations of Nature and Men" (1637)⁴. Dazzling luster of silk fabric was produced by means of the boiling with an aqueous solution of ashes and then of the steeping overnight in an aqueous mixture of the pancreas of hogs. In Chapter 15 of the *Pien-min thu-tsuan^{al}*, the "Collected Diagram for People's Convenience" (the second half of fifteenth century), the method of preparing the pancreas for scouring is described. The technique in which we suppose the action of the digestive enzymes of the pancreas is made use of is thought to form part of the silk manufacturing processes.

In Chapter 14 of the *Pien-min thu-tsuan* there is a description that the pancreas of hog is used also for the food technology. The art to soften meat of birds by cooking with the pancreas of a hog is described.

So, workmen of silk textiles or of cooking must have had the actual knowledge of the pancreas in the medieval China.

VI

In short, Chinese had known the pancreas though it was taken from the domestic animals. Stating further, it was, not only observed but made to use for living, after the first half of the fourth century. The anatomical description, however, was rather poor in contrast with the plenty of applications. Under the social and economic system of the medieval China, after all, medicine was not established as a modern science.

In this connection, it should be taken into consideration that inhibited development in the culture as a whole acted to retard the further development of

medicine. Was Chinese imperviousness to external stimuli of medical science, in particular occasion of the Jesuits at Peking, caused by the same circumstances?

References

- 1 OGAWA Teizō. 'History of Japanese Anatomy before Meiji Restoration' (in Japanese). In *Meijizen Nihon Igakushi*, vol. 1. 1955. pp.99-100.
- 2 It is mentioned that *i* is *san-chiao* in brief in Chapter 4 of the *Pen-ching feng-yüan* (1965), but there exists no evidence.
- 3 MIYASITA Saburō. 'A Link in the Westward Transmission of Chinese Anatomy in the Later Middle Ages'. *Isis*, 1967, 58 pp.486-490.
- 4 The *chu-i* is put into the hog-fat in the translation by SUN E-tu Zen and SUN Shiou-chuan(1966). This is not correct because hog-fat is *chih* in a solid state and *kao* in a liquid state, and furthermore *i* was counted as the common unit *chü* (numerative of corpses, utensils, etc.) to internal organs but not as the *sheng* to fat. Indeed, there are the prescriptions which indicated how to remove fat or blood from *chü-i* in the medical works mentioned above.

The Equivalent Characters for the Chinese and Japanese Words Appearing in the Text

a) 五臟	b) 六腑	c) 三焦	d) 栗山孝菴
e) 菥	f) 解體新書	g) 杉田玄白	h) 大機里兒
i) 臍臟	j) 宇田川榛齋	k) 甜肉	l) 全體新論
m) 胰臟	n) 醬林改錯	o) 王清任	p) 總提
q) 胰子	r) 肘後備急方	s) 葛洪	t) 豬脰(胰)
u) 千金要方	v) 外臺秘要方	w) 澡豆	x) 面脂, 面膏
y) 弁	aa) 證類本草	ab) 唐慎微	z) 合
ac) 本草拾遺	ad) 陳藏器	ae) 本草綱目	af) 命門
ag) 李時珍	ah) 消渴	ai) 崇寧	aj) 明
ak) 天工開物	al) 便民圖纂		