

Celestial Horses and Dragon Spittle

The Transfer of Material Culture on the “Silk Routes” before the Twelfth Century

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To mention what is called the “Silk Routes” today is to evoke more than two thousand years of history on two continents, Europe and Asia. Naturally, over such a long period and such vast territories, hundreds of products were transported, exchanged, stolen, conquered, transferred, in short, from one country to another. For some of these products, the very source of the raw materials and the techniques of production themselves were transferred.

Everyone knows that the Chinese invented paper, printing, gunpowder and the compass—great technological advances; as for the last three, their transmission throughout the world goes back only to the Crusades, which is quite recent. Here we are interested in transfers that are less known and more ancient, the most ancient for which precise records exist, starting from the time of the “opening” of the silk routes, which, according to Chinese classical history, was during the second century B.C. We shall stop around the eleventh century A.D., at the time of the Sung dynasty. This period includes the two most interesting epochs, in our opinion, in the history of the exchanges on these routes: the Han dynasty (from 206 B.C. to 220 A.D.) and the Tang dynasty (618-907), epochs whose time frames encompass the Western Roman empire, the Eastern Roman empire, the *kou-chau* empire, Sassanid Persia, and the first centuries of Islam.

The Means of Transfer

How did mineral, vegetal and animal products pass from one country to another twenty centuries ago? Some plants spread

almost spontaneously, by proximity; some products slipped from one country to another in the arms of ambassadors, as "tribute" or "gifts" or through the intermediary of merchants; sometimes these transfers served military purposes, or were linked to economic imperatives and brought about through authority and violence, abduction, and pillage; some transfers were carried out through fraud or ruse; some, finally, through princely marriages.

Moo-su Grass 苜蓿, 苜蓿

One of the plants that was transferred from one country to another in the wake of military operations was alfalfa, our banal and well-known forage plant. Curiously enough, the history of alfalfa is known for certain. It so happens that we are sure of this history, for there are precise texts, in which enough words are used to designate it in the vocabularies of different countries that little room is left for doubt, which is not the case for all plants, as we shall see.

Alfalfa was spoken of from the very beginning of the military history of the "silk route," or what would later be known by that name. Chinese historians place the "opening" of relations with Western countries around the time of the Chang Ch'ien mission in 138 B.C. This well-known episode in the history of the Han dynasty had a strategic motive, the emperor Wu-ti's desire to form an alliance with the kingdoms situated to the west of the Hsiung-nu territories, in order to conquer them from the rear. The Hsiung-nu were a nomadic people who harried China on its north and north-western borders. In other words, nothing was known of the countries situated further to the west, and the mission was a true exploration. Its history is long: we know only that after a great many adventures Chang Ch'ien returned thirteen years later, after having gone as far as Sogdiana and Bactriana, at the limits of the Parthian empire. Upon his return around 125 B.C., or a little later on his return from a second voyage, he brought back two plants unknown to the Chinese: alfalfa and the grapevine.

One can well imagine, given the length of the journeys between the borders of the Amou-Darya and the capital, Chang-an (now Xian), that the only plants that could be transported in good con-

dition would have been dried plants or seeds. No plant or cutting, certainly, could have survived months in the desert. One must therefore concede that it must have been the seeds of alfalfa and also of vines, i.e., grape seeds or dried raisins, that were brought back to China and made it possible for these exotic plants to be grown there. We shall come back to the grapevine; but what of alfalfa?

Alfalfa, as Chang Ch'ien learned, is the best fodder for horses, making them healthy and strong. Horses were the backbone of war, one of the pillars of a country's military prowess. All the nomadic peoples who surrounded—and threatened—China to the north and northwest, were horse-breeders; China, on the other hand, was a country that lacked pastures, and horse-breeding was not easy there. For centuries, the need for horses was to be an important aspect of Chinese politics with regard to its nomadic horse-breeding neighbors, and this engendered a system of exchange—silk for horses, then tea for horses—which lasted until the eighteenth century. But during the time of Han Wu-ti the neighbors were enemies; the emperor hoped to develop horse-breeders on his own territory; and then along came Chang Ch'ien, who brought him—along with the news that in central Asia, in the country of Tayuan, there was an exceptional breed of horses—the staple of their nourishment: alfalfa, which was sown, acclimatized, and cultivated in imperial gardens. Later the cultivation spread elsewhere.

The country of Tayuan was none other than the valley, or rather the depression, of Fergana, encircled by high mountains, situated on the upper course of the Syr-Darya river, in the present-day Republic of Uzbekistan. From the time of the Muslim era on, it would be known as the kingdom of Kokand. An abundant valley, the "pearl of central Asia," today this region is a great producer of cotton, silk, grapes, pomegranates and other fruit, livestock and the mineral-oil industry. Alfalfa is still cultivated there. During the time of the Han, its capital was Eulshe, whose ruins, they say, are still visible near the village of Markhamat, in the oblast of Andijan, to the northeast of the present town of Fergana.

The *Ch'ien Han Shu*, or ancient Book of the Han, a historical chronicle drawn up at the end of the first century A.D., tells the history of the introduction of alfalfa, calling it *moo-su* (or, more exactly, the characters it uses to designate it today are pronounced

moo-su); this word is probably the phonetic transcription of the local name of the plant in the dialect of Tayuan, perhaps an Iranian dialect. But where did this horse-grass originate?

It seems that it originated in Media, the ancient name of a region situated in Iran, just south-west of the Caspian Sea and in the north-western part of present-day Iran; its capital was Ectabane, now Hamadan. Alfalfa grew there in abundance and was considered the best possible fodder for horses. The Greeks called it Median grass: *medike poia*; the expression is found already in Aristophanes in 424 B.C. The Latin authors Strabo and Pliny, among others, tell us that it was introduced to Greece in the wake of the wars of Darius (the sixth to fifth centuries B.C.) and that the Greeks likewise made it the principal fodder for their horses. According to Berthold Laufer, it then spread to Italy between 150 B.C. and 50 A.D.; long before that it had reached Fergana.

The Greeks were faithful to the appellation "Median": *poa* or *poia médiké* was to come down to the language of today. It was not the only plant baptized as "median" by its origin: among the authors of the first centuries A.D. one finds a Median juice, and a Median apple (which is the lemon). These appellations of origin are not always reliable. In fact, they often indicate merely from where a country received a certain product; but this product might have come from much further, from another place and before that yet another, and little by little from the other end of the world. To cite but one example, most of Europe call "turquoise," from Turk or Turkey, a stone which came to them perhaps through Turkey, but which in fact was mined in Persia. For many products, the origin of the name is lost through multiple phonetic transcriptions in several languages, some of which have been forgotten. Words designating a product are extremely interesting for tracing the circulation of a product, but they don't always indicate its first origin. It is like a passport on which have been stamped, border after border, successive entrance visas, which become the successive denominations for the product as it crosses the various countries in its path. But it is a passport on which, at times, the first page is lost or illegible, so that no one knows from whence this passport was issued, the first identity of the product, its first origin. How can one then know what name first designated it, if this was from an unwritten

language of which nothing remains, or from a language such as Chinese, which has preserved a word of which two thousand years later only the pronunciation is still known?

By chance, everything seems clear for alfalfa, as opposed to certain vegetables whose identification has given rise to volumes of linguistic, geographic, historical, and botanical discussions. Copying the Greek, Latin adopted the word *medica*, which was so well adopted that in modern Italian alfalfa is still known as *erba medica*; the modern scientific word, based on this, is *medicago sativa*. According to B. Laufer, the ancient Iranian word *aspasti* or *aspastu*, appeared in a Babylonian text around the year 700 A.D.; the modern Persian literary word is close: *aspest* (but the word in modern spoken Persian is the Turkish word *yondieh*). The word *aspest* is no doubt the origin of the Arab word *al-fasfasa*, which spread to Spain, probably with the Arab horsemen themselves, giving the Spanish *alfalfa*, the word which, curiously enough, has prevailed in the United States (it is the Anglo-American word alfalfa which Laufer uses in his chapter on that plant), while all of modern Europe uses words similar to the French *luzerne*.

A curious mental twist led to the idea of brilliance that resulted in the word *luzerne*. If the *Dictionnaire de l'ancienne langue française du IXème au XVème siècle* by Frédéric Godefroy was unaware of the plant, the large Robert dictionary and the *Trésor de la langue française* tell us that in order to designate this type of sainfoin in French, there appeared *lauserne* in 1566, *lyserne* in 1581, and *luzerne* in 1600. The origin would be the Provencal *luzerno*, a metaphoric denomination due to the shimmering look of the seeds; indeed, all these words come from the Latin *lucerna*, or lamp; the word *luzerno* still means "glow worm" ("ver luisant") in certain French dialects. The Latin word *lucerna* also had the meaning of "phosphorescent fish." The word *luzerne*, as it now exists, was established in the *Dictionnaire de l'Académie* at the end of the seventeenth century, entered into the English language (*lucerne*, *la-lucerne*) where for some time it rivaled "purple medick;" but today the word "alfalfa" has been gaining ground.

One could go on in this fashion for all languages; we will content ourselves with having given a simple example of this type of research, for a single product. Let us nonetheless point out that aside

from its use as fodder, alfalfa (the seeds) was at times used medicinally (according to Dioscorides and Paulus Aeginata, who will be cited later) and as a food for humans, but little appreciated as such.

Celestial Horses 天馬

Chang Ch'ien had no problem bringing back alfalfa seeds. It was less easy to bring to China the horses for whom this fodder was destined. We know that after a long period of captivity among the Hsiung-nu, the Chinese ambassador arrived at the country of Tayuan and stayed there for a long time. He noticed a very fine race of local horses, known as "celestial horses," or "horses which go a thousand *lis* a day" (or again, "horses which sweat blood," but that's another story). People said that they were the result of crossing domestic mares with wild horses living in the high mountains in that country. They were more handsome, stronger, more resistant, and faster than the horses used by the Chinese army; their shoes lasted longer, they were better adapted to the mountains.

The relations between China and the Tayuan were not bad. The exchange of ambassadors, after Chang Ch'ien's return, took place regularly without interruption. The Chinese sent silk, and undoubtedly armor as well; the people of Tayuan sent horses. But a day came when horses were refused to the Chinese; the most beautiful "presents" (even a massive horse in solid gold!) produced no results. Then diplomatic persuasion gave way to armed persuasion—the dispatch of a Chinese expeditionary force, the siege of the town of Eulshe in 102 A.D., a bloody war, then entrance into the town for negotiations. The Chinese were apparently victorious but their position was precarious; the Tayuan leaders threatened to exterminate all the horses: the war had not been won. In the end the Chinese agreed to withdraw, taking three thousand stallions and pregnant mares with them. Nonetheless, in spite of the introduction into China of this new breed of horse and alfalfa, in the centuries to come the Chinese still had to acquire horses from their nomad neighbors, through exchange, tribute, or taxes.

Vineyards and Grapes 蒲陶, 葡萄

From the country of the Tayuan, Chang Ch'ien also brought "seeds" of the vine. The *Ch'ien Han Shu* designates grape and vine by means of two ideograms, *p'u t'ao*, another phonetic transcription, it would appear, of a local word, perhaps from the Iranian language. Some have seen here a deformation of the Greek word *botrys*, grape seed. Whatever its origin, which is still highly debated, the name *p'u t'ao* remains, in a similar form, in the current Chinese language.

Originating, some say, in ancient Armenia, or in any case in the regions south of the Caucasus, the grapevine quickly spread to Iran, Greece, Italy and central Asia under Iranian influence. And one finds it in the imperial Chinese gardens of the second century A.D.. But in China grapes were used for several centuries as a fruit, fresh or dried, while neither wine nor alcohol was made from it. Production in China itself was minimal, while vines flourished in the oases of central Asia, whose climate was perfectly suited for them; who hasn't heard of Tourfan grapes?

Wine made from grapes was not, however, unknown among the upper classes of China; it was imported, in small quantities, from western territories. Military circumstances, once again, brought even the art of wine making to China in the seventh century.

In the dynamism of expansion which characterized the first century of the T'ang dynasty, the Chinese sought to conquer, or reconquer, the oasis-kingdoms of central Asia—including that of Kao-tchang (also known as Qoco, Ssu-chou), situated not far from present-day Tourfan, which they took in 641. The king of Kao Chang was made prisoner and brought to Chang-an, as were his best musicians; shortly thereafter specialists in wine making were brought too, as well as a new variety of grape with long purple fruit particularly suited to wine making, the cuttings of which were imported in 647. According to historical sources, this technique was thus introduced to China; nonetheless, wine made from grapes never became either a national beverage or a mass production in China.

Did Chang Ch'ien only bring back two plants, alfalfa and grapes, from his expedition? Later, a sort of *Chang-Ch'ienism*

would attribute the introduction of many other plants into China to him, but undoubtedly this is an exaggeration, given the conditions of his travels. One must be wary of crystallizing the entrance of a product or a technique into a country around a single voyage, a single person, or a single event. Since everything in the ancient world was symbolized by the sovereign, tradition usually attributed all inventions and technical innovations to the intervention of a king, emperor, khan or princess—as we shall see with silk. But in reality, behind historians' fixation on an imperial court (such as that of Han Wu-ti and Chang Ch'ien), how many unsuccessful attempts and missed opportunities of private and local operations, of which we have never heard mention, must there have been?

The Silk Princesses

The question arises especially in the diffusion of sericulture, whose history is so well-known that we will but summarize it briefly here. It is a history systematically focused, in the East as in the West, on kings, emperors and princesses.

The most widely accepted tradition is the following: in central Asia, around the year 400 A.D., there lived a king of Yutien (Khotan) who was dying of sorrow from seeing his kingdom go to ruin. Khotan's wealth lay in jade, but after the voyages of Chang Ch'ien, the inhabitants had developed such a taste for Chinese silk (which was obtained in exchange for jade) that all the jade in the kingdom went there. The theme of silk ruining a country runs through Western history, beginning with the Roman Empire, with its moralists and sumptuary laws. How, the King of Khotan asked himself, at the same moment as the Westerners did, how can we ourselves produce something that costs us so dear to buy from others? Indeed, people in Khotan already knew how silk was produced; but it was still impossible to procure the three things that were necessary for this production: silkworm eggs, seeds from a certain kind of mulberry tree, and technicians to raise the worms and treat the cocoons up to the silk-thread stage. The Chinese government, through strict laws, infallible controls—everyone was searched at the borders—and severe punishments, had up until that

point succeeded in preventing the three above-mentioned elements, and especially silk-worm eggs, from leaving China for the West.

The minister to the king of Yutien suggested a trick to him: ask for the hand of a Chinese princess in marriage, and persuade her to smuggle out the elements necessary for the introduction of sericulture in the kingdom. Indeed this had already been done before: a Chinese princess once given in marriage to the king of Wu-sun (a barbaric people, further to the north) brought what was necessary with her.

The minister took care of the proceedings; the emperor granted a princess; the minister succeeded in persuading her: her husband and the people of Yutien, for whom she was to become mother and protectress, would owe her eternal gratitude for making the fortune of her new kingdom. The rest is known: the princess hid the silkworm eggs in her head-dress and the mulberry seeds, mixed with other seeds, in her personal medicines, and disguised several women who specialized in raising worms and treating cocoons as attendants. In this way, after so many centuries, did the secret of sericulture escape from China.

Should we believe that it spread at such a late date? There are both Chinese and Tibetan variants: the princely marriage took place in the year 220 A.D.; or the princess in question was not Chinese, but the daughter of the emperor of Shan Shan, another oasis kingdom adjoining Khotan to the east, and this king, the blood nephew of the emperor of China (son of the emperor's sister) could have already had, through this kinship, silkworms and mulberry; in short, the same story with supplementary details.

This would amount to two transfers through princely marriages; a third would be the transfer made by the king of Wu-sun, which is no longer mentioned very often (might it be the one that took place in 107 B.C.?). And there was a fourth princely marriage which brought sericulture out of China, the marriage of princess Wentcheng, coerced into marriage in the seventh century with the Tibetan king Srongtsengampo, with open force, by Tibetans besieging the Chinese capital. The princess brought eggs and cocoons to Tibet and introduced sericulture there; but at that time it was no longer secret, and in any case Tibetan productions never rivaled the Chinese.

In Iran and around the Mediterranean, silk itself had for a long time been the object of an important trade, a fact so well-known

that we shall waste no time discussing it. Was sericulture introduced into Iran shortly after its spread to Khotan? Historical documents, it seems, are lacking. According to Iranian poetic and epic sources, and in any case much later, it could have come into Iran through the Punjab region, before having even reached Khotan. Certainly in the sixth century Persia was able, due as much to its intermediary position between China and the West as to its own production, to impose its conditions and its prices on the Byzantine Empire; and in turn the Westerners made every effort to find a way to produce for themselves that which cost them so dear.

Who does not know the story? About a century and a half after the arrival of the "silk princess" in Khotan, the Byzantine emperor Justinian, around 553-554, received two monks (Nestorians?) who brought him, from "Serinda" (central Asia rather than China proper, and perhaps even Khotan, where sericulture never ceased to prosper), some silkworm eggs hidden in a "hollow rod" or "little wooden box." Such was the beginning of the raising of silkworms in the Byzantine world, according to accepted tradition. But here too, how can we believe in a single event, which succeeded on the first try? Moreover, at such a late date, we can well imagine that the secret had filtered in from everywhere, and that at least twenty times, here and there, people had the means to pass on silkworm eggs. Developed in Syria and in Asia Minor, sericulture was brought to Spain in the eighth century in the wake of the Arab conquests, then introduced into Sicily, where it was spread into Christendom, Italy, and the Avignon area. If sericulture, properly speaking, has been practiced for three thousand years in China, its dissemination westward began only fifteen centuries ago, and it would take a few more to pass from Khotan to Spain and Italy. Never, in any case, could Europe dispense with buying raw silk from Asia, from China, India or Japan.

Paper

From China came a major invention, paper. Its economic importance was less than silk, a Chinese mass production that gave rise to commercial exchanges of enormous proportions, but its cultural

significance is incalculable. Paper brought about the invention of printing and the printing press and, from there, the circulation of books: holy books of the Buddhist canon, classic Confucian texts, historical annals, and scientific and medical books—books in all fields of human knowledge, produced in a great number of copies and at relatively affordable prices; such were the first benefits of this invention. And in this instance as well, should we believe in a sudden and unique invention, in its transmission in a single step?

Traditionally, the Chinese sources place the invention of paper in the year 105 A.D., by a certain Ts'ai Lun, native to what is now called Szechuan. Before that, people wrote on thin sheets of bamboo or wood, and more recently on silk; brushes and ink had already been known for a long time. In the year 105, then, the emperor was presented with a paper made of pounded bark, hemp, old rags, pieces of fishing nets: a supple, thin, inexpensive writing support made of materials that were easily procured and which lent itself to brush and ink. From that point on the fabrication of papers made of hemp and mulberry bark began, and sizing was perfected by adding glue, gypsum, gelatin and starch.

Is it going too far to pinpoint what was perhaps a slow process on a single event? In 1987, Jean-Pierre Drège, who has devoted many years to the history of paper, brought together all the recent discussions of archaeological findings of the last forty years that might prove the existence of Chinese paper more ancient than the end of the first century. He concludes that Ts'ai Lun was perhaps not the absolute inventor of paper, but the technician who improved and perfected an already existing, but still rudimentary technique.

From the year 105 on, in any case, the use of paper spread throughout China and supplanted all other writing supports.

As early as the year 175 the classical Confucian texts were engraved on stones, in a "forest of steles," to assure their preservation. Later people began, with sheets of paper in fact, to print these engraved texts. This was the first phase of printing: reproduction with ink, on paper, in some instances, of a fixed text, engraved one time for all, plate by plate, with the printing able to be repeated until the engraved relief wore out. All that remained was to replace the heavy steles with movable hardwood plates. This was how the first Buddhist books were printed in China, the

oldest printed book being a copy of the Diamond Sutra found at Tun-huang; it was supposedly printed in the year 868. Buddhist books were thus reproduced in this way for centuries, long after the invention of movable type spread throughout the whole world. The Tibetan monastery of Dergue, situated in the present-day Tibetan district of the Szechuan province, reproduces Buddhist canons from engraved wooden plates even at the end of the twentieth century.

The West wrote on papyrus and parchment until the Arab conquest reached France to the west and the river Talass to the east, in present-day Kazakhstan. In 732 the Islamic conquerors encountered Charles Martel at Poitiers, and the Chinese general Kao-hsiang chih in 751 at the battle of Talass. This was, for a period of time, the extent of Muslim power. Even though the Chinese troops had withdrawn, General Ziyad ibn-Salih stopped there; but he took a great number of inhabitants as prisoners, among them weavers of silk and Chinese paper-workers. He would transfer the former to Irak and the latter to Samarkand, a town which would become a great center of paper production during the Middle Ages. This industry was then implanted in Baghdad, and later on the southeastern coast of Arabia and in Damas, which exported paper throughout Christendom. The technique was then transmitted to Muslim Spain during the twelfth century, to Italy during the thirteenth, and to Germany during the fourteenth.

The Fabrication of Colored Glass 璧流離, 琉璃

From west to east as far as China, a technical invention spread during the fifth century A.D., which, while not having played the capital role of silk or paper, was important commercially: the fabrication of glass, and especially colored glass. This technique is extremely ancient in Europe; it was perfected, according to Pliny, by the Phoenicians. It is already mentioned in Greek texts of the fifth century B.C. In Roman times, Italian and Syrian glass was everywhere—glass that was colored or almost white, vessels and necklaces of beads of multicolored glass paste-dotted the routes of

trade and Roman influence from the banks of the Mediterranean to the ports of India, from Celtic tombs to central Asia. The Chinese knew of it from the time of the era of Han; in chapter 96 of the *Ch'ien Han Shu*, devoted to the Western territories, the word *pi-liu-li* appears to designate colored glass, reputed to be produced in the Kipin, the kingdom which corresponds more or less to the present-day Kashmir. The *Ch'ien Han Shu* attributes to the Kipin many products that could not have originated there, such as coral; the making of glass, however, could have come not only from the West, but also from India. The word *pi-liu-li* has been linked to the sanscrit word *vaidurya* and the Pali word *veluriya*, which designates a fine stone, lapis lazuli or rock crystal. The term *pi-liu-li*, *liu-li*, would give way to the word *poli*, which still means glass in modern Chinese today.

It was soon discovered that these charming objects, purchased so dear in China, were mostly produced in Tatsin, or in Folin, two names which more or less designate the Eastern Roman Empire, then in Byzantium, Antioch or Alexandria, and also in Persia and in the kingdoms of Tashe and Arabia. In 424, according to the *Peishe* or history of the northern dynasties, there arrived at the Chinese court of the Northern Wei, then situated in Tatong to the north of Shansi, people from the country of Ta Yueh who asserted that they knew how to make colored glass. The Ta Yueh chih, the ancient name of the Koushan, must have at that time covered Afganistan, part of Bactria and part of Northern India. These Indian, or Iranian, people were traders in the Chinese capital; as agreed upon by the emperor, they searched and found, in the neighboring mountains, the necessary minerals and made a demonstration that was a great success. Their glassware brilliantly surpassed the glassware imported from the West—it was translucent, and the colors were superb. A hundred workers were trained, and from that moment on the technique was developed in China and glass became plentiful and affordable.

This industry would nonetheless remain minor, for the Chinese were to perfect the technique of porcelain which, along with silk and tea, would become, from the seventeenth century on, the three pillars of Chinese exports.

The Hierarchy of Exchange Systems

A strange characteristic of Chinese history is that international exchanges often began in the form of “tribute” (of local products) sent by foreign kingdoms considered “vassals,” and to which the emperor of China granted “presents” in return. This exchange (reciprocally advantageous) was done on a large scale, in a sort of swapping on the highest level. It was the principal form of international trade evoked in the most ancient Chinese histories; it is also the most hierarchical, most controlled form of commerce—the image of a regime resting on centralism, hierarchy, the strict control of rigid laws, and the special status of the emperor, the cosmic pivot. Many levels of transaction led from these princely exchanges to open commerce, and the tribute/present system, reduced to the state of a diplomatic fiction, slips through all these levels, as in the rest of the world: semi-free trade with fixed quotas, forbidden products, taxes, the privilege of pre-emption of the sovereign upon arrival, royalties, leasing and monopolies granted to this or that person, without ever attaining, no more in China than elsewhere, complete freedom.

Medicinal Substances, Spices and Perfumes

Whatever the geographical and political constraints, products did circulate and were exchanged. In the period of interest to us, medicinal substances, spices, and perfumes played an important role. There can be no doubt of this if one reads the accounts of explorations, medicinal treatises, or trade guides. These substances related to health in the broadest sense, including cooking and diet, from the luxurious amenities of the rich, to the scents burned for religious purposes. Religion and health were in any case strictly linked, since certain illnesses were believed to be brought about by the influence of evil spirits or the wrath of the gods, whom fumigations appeased or chased away. In any case, burning incense to the gods inspired them to spread their benevolence and protection over the devoted. Furthermore, spices were not consumed for taste alone, but for their healthful virtues.

Let us, for example, leaf through three more or less contemporary works from the end of the first century A.D.: the *Natural History* of Pliny the Elder, the treatise of the Greek doctor Dioscorides, and the *Periplus of the Erythrean Sea*, a sort of commercial guidebook of the ports from the Red Sea to Indonesia, written in Greek by an unknown author. Among the medicinal products not indigenous to the Greco-Roman world, plants from India and Arabia predominate. The concept of India, however, is vague and vast, here stopping on the coast of Malabar, there designating everything east of the Indus. Ethiopia, the island of Socotra, Asia Minor (Syria, Judea, present day Turkey), Armenia, Medea, and finally Sarmatia, by which we are to understand the Ukraine and beyond, are all sources of commonly used medicinal plants and minerals. Some of these, or mixtures thereof, would in time make their way to China.

Indicum, without a substantive—"the Indian thing,"—designates an Indian stone, "which resembles sea foam"; another "*indicum*," used by dyers, "purple as a copper flower" might be Indigo, well known as a blue dye, which later would pass into China. Dioscorides attributes to India an "aromatic reed" distinct from sugarcane, *saccharum*, which was already well known, and a good dozen products called *agallochum*, aromatic wood, in Latin; *aloe*, the aloe, of which the juice of the dried leaves was used; *bdellium*, a sap (a *balsamodendron*); *cardamum* (cardamon, of which the seeds were used); the root *costus* (*saussurea lappa*) which yields an essential perfumed oil; *costus*, which also grew in Arabia and Syria and later be found to be plentiful in Kashmir; *macir*, a bark; *mala-bathrum*, or Indian nard, or "Indian leaves" (*folia indica*), which would be the leaf of a lauraceous plant whose bark is known as *cinnamomum*, cinnamon; *onycha*, the opercula of shells "gathered in India in the lakes that produce nard" when these lakes are dried up; others are gathered in the Red Sea. Chinese medicine would later use the same type of opercula, brought into China from the south, and would export them; from India also came *piper*, or pepper, in great quantity.

Often one can only refer to this ancient material by using their Greek or Latin names, because the identification of the plant or mineral is still debated. Here we cannot go into, nor involve the

reader in, the linguistic and botanical controversies such as the debate over *cinnamomum*, *malabathrum*, and *cassia*, with the latter often confused with *cinnamomum*, etc. The products came into trade in dried form: seeds, dried rhizomes, concentrated or dried juices, bundles of dried herbs, barks, roots, powders; some were adulterated with less costly, more ordinary substances, making it impossible to identify the living plant. In short, during the course of so many centuries, the words have evolved; the same word at times designates successively different plants; the trade vocabulary did not concern itself with botanical accuracy and what we are left with has little certainty to it.

What do we find in Dioscorides? Arabia is the largest provider of aromatic substances. We find a large quantity of myrrh (in Greek *myrna*, Latin *myrrha*, the scientific name *balsamodendron myrrha*), a shrub from which the resin was gathered, as well as the incense (in Greek *olibanon*, Latin *thus*, scientific name *boswellia turifera* or *boswellia*), which is also a resin, and burnt for the gods. Production is a monopoly and its trade controlled. Arabia also furnishes the plants *cardamomum*, *cassia*, *costus*, *agallochum*, *zingiberis*, *othonna*, *cancanum*, *terebinthus*. Off the south coast of Arabia, the isle of Socotra furnishes the best aloe in quantity.

The best *cinnamomum* (cinnamon) comes from Ethiopia through the port of Mosylum on the Red Sea, which exports it by the shipload. *Styraz*, in Latin *storax* (the shrub *styrax officinalis*), which would eventually reach China, is, for Dioscorides, the resin of a shrub which grows in Cilicia and Pissidia (south of Turkey in present-day Asia) and in Gabala in Seleucia (a region of Syria). This would be the *sou-ho* mentioned in the *Hou Han shu* or book of the ancient Han, written in the fifth century, or at the very least, these words are pronounced "sou-ho" today; the storax of this time was our *styrax officinalis*, but the Chinese later named another perfume sou ho, liquid storax, (*liquidambar orientalis*).

From Judea comes *balsamum*, from Armenia *amomum* as well as *cardamomum* and *armeniaceum*, which might be an ore of copper carbonate (it has been suggested that it was lapis-lazuli), used as a medicine; and also an "Armenian apple," or "early fruit," which is the apricot. From Medea comes the "Median apple," the lemon, and from Persia the "Persian apple," or peach. From far away,

from Sarmatia, comes the *agrarium* mushroom and especially the *rha*, which is also called *rhacomatis*, *rheon*, pontic root; the name *rha* comes from the river Rha, near Tanais, the Don. This is our rhapontic, a rhubarb. Only centuries later will rhubarb be received from China. And on the subject of China, we note that at the end of the first century A.D., while the Roman world knew "sericum," or "the Seric thing," which is to say silk produced by Seres, or China, no medicinal or aromatic substance is said to be Seric, nor said to come from the country of Seres.

Venoms, Poisons and Theriacs

We cannot enumerate the therapeutic virtues of the various substances, for this would take too many pages and too many discussions. Let us note, however, a few of the major medicinal preoccupations of the time; aside from the large categories of illnesses and the concern over child-bearing, one sees that two life-threatening dangers were animal bites and poisons. Hunting, voyages into deserted area infested with ferocious beasts, and the nearby presence of the latter in the countryside, made these dangers quite frequent; one has the impression that snakes were abundant and that scorpions, poisonous spiders and dogs, rabid or otherwise, were commonly encountered. Whence the concoction of medicinal compounds reputed to heal all bites; these are called theriacs (Greek *theriakè*, Latin *therica*, from the Greek word *ther*, or wild animal). Their fabrication is supposed to have begun in Rome precisely during the time of Dioscorides and Galien. They were popular until the eighteenth century. The formula included several hundred substances, many of which were the medicines listed above. In 667, some ambassadors from Byzantium or Asia Minor offered some to the Chinese emperor Kao-tsung.

Alongside the *therica* are the *alexipharmaca*, which is to say the antidotes to venomous and poisonous plants, animals, and minerals. Often the word theriac encompasses both remedial categories: bites and all poisons. We know the importance accorded to poisons, the fear of poisoning and the accusation of poisoning, in reality and in the imagination of peoples.

One notes in Pliny, in the *Periplus*, and in Dioscorides, the absence of a product which during the Middle Ages will experience worldwide diffusion: musk. It appears that it had not yet reached the West; that would take another three centuries.

Everyone knows what musk is: a powerfully smelling substance secreted by the glands which line a sort of pouch situated beneath the belly of a small cervidae, the musk-deer (*moschus moschiferus*), which haunts the wooded mountains of the Himalayas of Tibet, several Chinese provinces (Yunan, Szechuan, Kansu), the upper Tonking, the Altai, Manchuria, Siberia, and Korea. The musk pocket is situated between the navel and the genital organs of the adult male and the secretion is related to the sexual activity of the animal. Musk was part of the payments in kind sent by the provinces to the Chinese court from the time of earliest antiquity; the most valued was that from the Tibetan borders. Very early on it became used therapeutically and in perfume making, the two being linked. It is still part of Chinese pharmacopoeia; in Europe, the ancient medicinal use has disappeared today, and musk is almost no longer used in perfume making (the animal is in an endangered species and protected as such, and the chemical synthesis of musk was developed long ago).

Was it really unknown to the Arabs, Persians, and the Western world until the sixth century A.D.? The notes of Ali Mazahéri lead one to believe that there is no mention of it in Arab and Persian literature before that date. It is also in the sixth century that one encounters a description of the animal in a Greek author, a traveler to India, Cosmas Indikopleustes. One is surprised to see the musk-deer described by Cosmas by the name *kastouri* which is still today its name in Nepalese, and in Hindi as well, with slight variation. The word *muscus*, designating the product, appears for the first time at the end of the fourth century in the writings of Saint Jerome, who vilifies it as a perfume but seems to be unaware of its medicinal properties. From the Greek word *moschos*, the Latin *muscus*, comes the French *musc*, the English "musk" and all their cousins. One reads with interest the notes of Ali Mazahéri on the different words designating musk. Medicinally, it will not enter our therapeutics until around the sixth to seventh centuries. Its role in perfumes, in Iran, in Arabia, in Europe, was consider-

able. In China it was from time immemorial in pharmacopoeia. Among the virtues of musk, which are many, the most ancient one cited in the Chinese encyclopedias was that it was immune against snake bites. The animal itself does not fear snakes; it attacks and eats them, say these ancient texts. Now that is what makes a good theriac! We can compare this virtue of the musk-deer, which is a cervidae, to what one reads in Pliny, Dioscorides, and Paulus Aeginata, the seventh-century Greek physician, on the antidotal properties of stags—our European stag: according to these three authors, the testicles of the stag, dried and reduced to powder and taken orally, are an excellent remedy for viper bites.

Taoists, Perfumes, and Immortality Drugs

The epoch of the T'ang dynasty (618-907) was for China, until the second half of the nineteenth century, one of the great epochs of "opening." Not only did the empire touch the Pamirs to the west, make maritime contacts to the east and south, but religious tolerance (until 845), the great curiosity of the Chinese sovereigns for all that came from abroad, new inventions, and science and technology, made it a country which welcomed religious men, doctors, engineers, and merchants. In the seventh and eighth centuries everything converged in the Chinese courts. Many ambassadors brought the "tribute" of their local products or items imported from even further away, exotic curiosities or fundamentally utilitarian products. Plants were very much a part of this. They were transplanted into imperial gardens; among others the "golden peaches" sent by a kingdom situated in the present day Uzbekestan, which have never been well identified but which provided the title for an excellent book on our subject, *The Golden Peaches of Samarkand. A Study of T'ang Exotics*, by E.H. Schafer. Products from the West, from central Asia, India, and Southeast Asia flooded in, as much through official ambassadors as through the routes of ordinary trade. Special relations were maintained, especially with India, because of Buddhism, but also with Tibet, which was to obtain a Chinese princess in marriage and become a great central Asian power, as well as with central

Asia and Persia. Ambassadors were even received from Folin, the ancient Tatsin, the Eastern Roman empire and Syria.

This was a great epoch for botanical encyclopedias, and medical treatises. Perfumes became very important. India, Arabia, and Southeast Asia furnished many aromatic and medicinal substances. Iran had developed the art of compound perfumes. The Muslim trade network (the Arab conquest put an end to the Sassanid dynasty in 651 and progressed rapidly for a century) transported these substances in every direction. The upper classes of Chinese society lived in a cloud of perfumes and fumigations of all sorts of incense. Baths, rub-downs, oils, perfumes inhaled, applied, and burnt, for pleasure, for health, for Buddhist and Confucian religious cults; here again, notions of physical ailments and supernatural influences mingle in the concept of health: certain medicines are reputed to drive away evil spirits, incubi and evil powers. The same properties were attributed to certain gems and coral, whose diffusion, from the Mediterranean to Mongolia, passing through India, Tibet, and China, began with the opening of the "silk route," and perhaps before it.

More particular to the T'ang dynasty, whose official religion was Taoism, and more surprising to us, is the importance the emperors gave to the confection of the immortality drug, sought by the Taoists. In order to make it, it was necessary to procure certain plants or minerals which were not available in China. Indian physicians and wise men were famous at the time, and Indian medical treatises were translated into Chinese. In 648, a Chinese ambassador, returning from India, brought back with him an Indian physician and maker of medicines; in 655, a central Asian physician was welcomed in Chang-an and sent to India the next year in search of products intended to create the immortality drug. As far as we know, no emperor became immortal, and it has even been suspected that these Indian wise men and others caused the death, with poison, of at least two of them. Would they have lived longer had they taken advantage of the theriac offered by the Western ambassadors? Greek medicine was also highly regarded at the time and has also passed down treatises to us. In them we find several ancient and new Eastern substances, just as the T'ang pharmacopeia absorbed Western products; indeed, there

began on both sides a general assimilation of the available pharmaceuticals (including, we repeat, aromatic substances, we repeat, for the two are combined) in the known world.

In the T'ang epoch, the port of Canton became one of the great ports of the world for perfumes and drugs. Saffron (*crocus sativa*) arrived in China from India and from Bukhara (the Kashmir became a great exporter of it) while the narcissus was reputed to come from the Roman Empire but might have originated in Persia. There was also the perfume *a-wei*—*asafetida*—a gum-resin (*narthex asafoetida*) from the Iranian province of Lauristan and in the region of Kandahar; the liquid storax mentioned earlier, which comes from a balsamic of Southeast Asia; the "An-si perfume" (An-si is one of the ancient Chinese names for Oersia), a word which after designating the *bdellium* later served as a name for benjamin, an aromatic resin from Indochina and Indonesia alleged to ward off evil spirits; Arabian incense which serves both as something to burn before the gods and as a medicine for man; Indonesian clove (*caryophyllus aromaticus*); jasmine oil from Persia. Under the T'ang, as under the Sung, ambergris, the pathological perfumed secretion of the sperm-whale found in the sea off the coast of the Somali and the Nicobar islands, became widespread. Arab merchants introduced it into China where it was called "dragon spittle perfume." The blue dye we call indigo, which was abundant in India, passed into China through Persia. Rhinoceros horn could be bought in every port. China exported musk, which it seemed to possess in great plenty.

At the other end of the world, in the medicinal treatise of Paulus Aeginata one finds the medicines already mentioned by Dioscorides. One finds as well ebony, cloves and the root *nardostachus* or Indian *Spica Nardi* (*nardostachys jatamansi*?).

The lists above are not exhaustive; there are, according to the specialists, dozens of medicinal, aromatic, and tinctorial products which were traded during this period.

This trade of products from all over, this intense commercial and especially maritime activity was to continue into the next epoch, under the Sung dynasty which began in 960. This was still a great period of Muslim commerce. It was also during the Sung epoch that the tea trade began to spread outside of China, though more over land, than sea.

Tea and Porcelain

Indigenous to China, tea, already used in this country though more as a medicine and with restraint, reached Tibet during the Sung epoch. The first use was princely and aristocratic, a "present" from the emperor to the king of Tibet; it spread among the Buddhist monks and, little by little, as in China, reached other levels of the population. It is significant that during the tenth and eleventh centuries the trade of silk for horses on the Chinese borders gave way to trade of tea for horses. Tea would not reach Europe until the seventeenth century through the Dutch, and its cultivation in India would not be organized in India until the nineteenth century.

It was also during the Sung epoch that porcelain, which had been developed in China, reached perfection. It would soon spread throughout the whole world to the extent that it became one of China's three foremost exports.

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We have mentioned here only a few of the products and some of the techniques which, from east to west or in the opposite direction, were diffused throughout the Eurasian continent. In truth, one should not be surprised by this diffusion, but rather by the number of centuries it took for this to come about; at least fifteen centuries went by between the moment China perfected the cultivation of silkworms and the moment the Chinese technique and the Chinese bombyx flourished in Khotan, in Persia, and on the banks of the eastern Mediterranean; and it took two more to cross the Mediterranean and pass into Spain! There was in all this, it must be said, a long-standing desire for secrecy. But how many centuries did it take for paper, developed in China shortly after the year 100, to be made in Samarkand in the eighth century, and in Germany only in the fourteenth? How many for musk to enter into European pharmacopeia? It took so few years for antibiotics to go around the world!

Perhaps we have—we the people of the twentieth century—a distorted vision of time: we find slow a progression which, on the scale of the millennia elapsed since the apparition of the *Homo faber*, is in reality ultra rapid, like a sped-up film—and this becomes the play of theoreticians who believe in the acceleration of history. In fact, how much time, how many generations, did it take for such and such a *Homo faber*, intelligent, observant, hard working, to invent fire, the cooking of food, agriculture, sericulture, glass and enamels, paper and to perfect the therapeutic utilization of plants? Mythologies are more modest than we who attribute all this to human genius, for most often they attribute these inventions to the benevolence of a god, or to chance, long, long ago. Compared with the time a human group takes to invent a technique, that it took centuries for it to pass to a neighbor is, all in all, very little.

Certainly, information is often withheld; monopolies and secrets are the pillars of power, as much in the economic sphere as in the military one. For sericulture, for horses, for paper, we see intrigue and ruse at work, but especially war, the brutal and simple right of the mightiest: abduction and capture at the point of a sword. Coveted horses are taken, the enemies' workers are taken prisoner; they are taken away, from Talass to Samarkand, from Syria to Spain, from Kao-Chang to Chang-an. Let us not forget the enormous slave trade of millions of men and women who, deported and sold, spread from one country to the next the knowledge of artisans, the talents of artists, and the foreign blood of captives, which paradoxically made destructive war a general factor of progress through the dissemination of knowledge and cross-breeding of peoples. Such is the posthumous revenge of the vanquished.

Thus, through accord or by force, we pass on the patrimony slowly acquired by intelligence, knowledge, and the work of men: the heritage, whether we like it or not, is shared.

Translated by Sophie Hawkes

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