



chapter two

The Necessities of Trade

Overland Travel



▲ 3rd Century CE Persian silver gilt dish. It shows a scene of a man hunting on horseback. The horse's tack, including its reins and stirrup, is carefully depicted.

The establishment of overland trade routes was, of course, dependent on people's ability to travel long distances and to carry a reasonable quantity of trade goods with them. The different types of countryside – hills, mountains, rivers and vegetation – all influenced the types of routes chosen, but it was animals, such as horses and camels, that really opened up the opportunities for people to travel longer distances and over longer periods. Until the railways of the Nineteenth Century, this was the means that enabled large scale overland trade to take place.

The type of transport varied along the Silk Route, with merchants using either ox or horse-drawn carts, camels, pack asses or pack horses, depending on the land being crossed – different animals were better suited to different terrains. The merchant might ride on a horse or a donkey, but he often walked beside the animals carrying the goods. The merchandise rarely travelled from one end of its journey to the other with the same traders, and never with the same pack animals. Usually goods changed hands a number of times along the way.

The domestication of the Bactrian camel took place in the Second Millenium BCE at the hands of the nomads of Central Asia. The Arabian camel was domesticated at about the same time. Both types, the

▼ Mongol nomads rounding up their horses. This is a modern continuation of their ancient traditions of breeding and riding horses.



Bactrian camel with two humps and the Arabian with one, have an amazing capability, vital for desert travel, of going for days without water. They need little food and carry much heavier loads than horses over distances of 35 km a day.

The horse has long been an important means of transport and was the animal most frequently used from one end of the Silk Route to the other. Throughout the Third Millennium BCE, the nomads of Central Asia had been breeding larger and stronger horses. The larger horses made riding possible. This skill was extremely useful, particularly in battle, and was gradually acquired right across Asia.



Improvements in the techniques of controlling the animals followed, especially the introduction of the foot-stirrup and a harness with breast- and collar-straps. These revolutionized the transportation of people and goods. Both appeared first in China, although the stirrup may have had its origins in Central Asia again where leather or rope straps were often used to assist in mounting horses. The use of stirrups gradually spread westwards across Central Asia and Afghanistan, and was introduced to Europe in the Sixth Century CE by the Avars of the Eurasian Steppe. The stirrup gave the Avar cavalry the upper hand in its battles with the forces of the Byzantine Empire. The Byzantine cavalry had to be completely reorganized as a result and later adopted the stirrup themselves.

▼ For heavy loads, stronger animals, such as these bullocks pulling carts in Mongolia, were used along sections of the Silk Route.



◀ Camels were not just used as pack animals. This stone relief shows an Arab in battle mounted on a camel. He is being pursued by the Assyrian cavalry on horseback.



Sea Transport

► 13th Century manuscript illustration from the *Maqamat of al-Hariri*. It is one of the few surviving depictions of Arab shipping before the arrival of the Portuguese. Notice how the planks of the vessel are clearly stitched together, not nailed.



Across mountain and desert, the camel and horse could hardly be bettered as a means of transport. By contrast, there was always room for improvement in the ships that travelled the Spice Routes. Developments in ship design and construction methods came about in response to challenges encountered in trading ever further afield. Observations made and information exchanged on these journeys also brought practical knowledge. So the expansion of trade by sea was closely bound up with the evolution of shipping and navigation. Some of the Spice Routes had been in operation from as early as

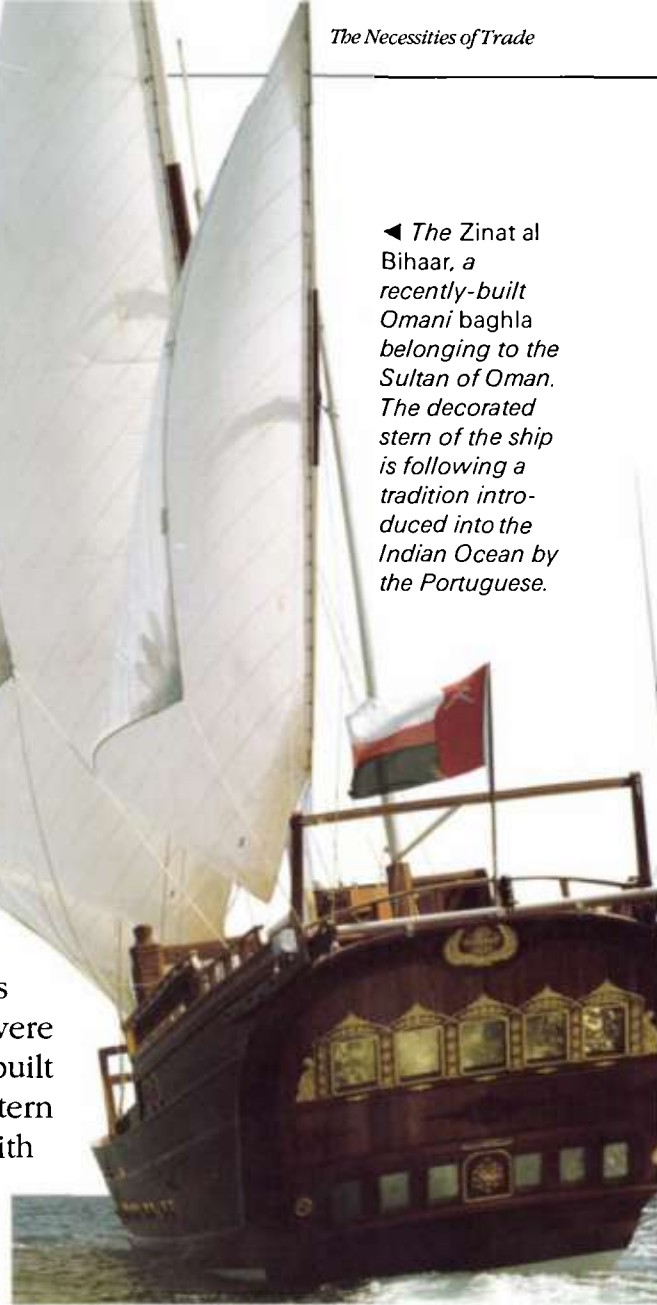
2000 BCE and the Romans had established them as an effective rival to the Silk Route for the passage of East-West trade. But it was under the Arabs and Omanis from the Seventh Century onwards that the sea routes really came into their own. The Arabs quickly recognized the importance of sea-power in defending their new and rapidly expanding Islamic empire. But they also came to see the great advantages that sea transport gave them in trading their products and earning them wealth as the predominant sea-carriers between East and West.

With their conquest of Syria (part of the Byzantine Empire) in the Seventh Century, the Arabs employed Syrian and Greek shipwrights to build them a powerful Mediterranean war fleet. Further east, a second war fleet was built for the Arabs by Persian shipwrights. All the ships and boats were carvel-built, that is, the planks of the hulls were laid edge-to-edge, not overlapping as they were in clinker-built ships common in northern Europe. But the ships of the Western Fleet followed the Greek and Syrian technical traditions, with the planks nailed to an internal framework. The ships of the Eastern Fleet, however, were built according to Persian and Indian practice, with the hull planking 'sewn' together with palm-fibre twine, which was cheaper and more easily available than iron nails.

It was in the Indian Ocean that the triangular lateen sail first appeared, and the Arabs introduced it from there to the Mediterranean sometime during the Seventh or Eighth Centuries. The lateen sail, although not easy to handle, enables a ship to sail much closer to the wind and so take more direct and quicker routes. The Portuguese caravel, in which they made the first European journeys around Africa to India, was similar in design to the Arab *baghla*, with lateen sails and carvel (caravel) planking for the hull.

Until the arrival of the Portuguese in the Indian Ocean at the end of the Fifteenth Century, little change took place in the design of ships in the area. However, the competition from the Portuguese boats led the Arabs and Omanis to substitute the stronger nailing for sewing in the construction of their ships. A square-sterned European design was also introduced in place of the sharp two-ended stern previously characteristic of Persian Gulf and Indian Ocean shipping.

◀ *The Zinat al Bihaar, a recently-built Omani baghla belonging to the Sultan of Oman. The decorated stern of the ship is following a tradition introduced into the Indian Ocean by the Portuguese.*



▲ *An Arab boat builder works on the construction of a dhow, a smaller sailing boat still used throughout the Indian Ocean.*



▲ This illustration from the 15th Century *Livre des Merveilles* is the first to show a compass in use in European shipping.



▲ A Chinese geomancer's compass used to make sure a building faced in a direction favourable to good luck. The navigational compass developed from this earlier use.

Finding the Way

Even the most experienced sailors frequently found themselves off course. Storms, shipwrecks and strange and often hostile lands were hazards common to all seafarers. Finding the way became easier as the larger and better-designed ships sailed further. Sailors brought back practical knowledge, as well as trade goods, which led to more detailed mapping of the oceans and coasts and improvements in the design of navigation instruments.

Once again, the Muslim sailors of Persia, Arabia and Oman added a great deal of knowledge to world geography, which they passed on to the Europeans. In particular, there was a lot of exchange of Islamic expertise in drawing up nautical charts, known as *portolans*. These were very important tools for the mariner as they gave wind directions and bearings needed to sail from port to port.

In the mid-Twelfth Century detailed information on India, China and North Africa was passed to the Europeans through the patronage of two kings of Sicily – Roger II (1127-54) and his son William I (1154-66). With their backing, an Arab scholar from Morocco called al-Idrisi (1100-66) produced a complete description of the world as then known to the Muslims. This information was set out in a series of seventy maps with a written description in a volume known as the *Kitab al-rujari* (The Book of Roger).



▶ Page from a portolan atlas c. 1650 showing the Arabian Peninsula and the eastern Mediterranean.



◀ A map of the world dating to 1486, based on Ptolemy's Geography.

Al-Idrisi's knowledge and that of earlier Arab geographers was partly based upon Persian-Sasanian, Indian and Greek sources. The influence of Sasanian geographical knowledge can be seen in many areas, such as the name for the Indian Ocean which the Arabs called *bahr al-fars* (the Persian Sea) following Sasanian examples. Indian and Greek geographical works were translated into Arabic, including those of the Graeco-Egyptian geographer, astronomer and mathematician Claudius Ptolemy (c. 90-170 CE). His monumental work, the *Geography*, was an early attempt to map the known world and provided the basis for much later Arabic cartography.

In the area of navigational instruments, the introduction of the mariner's compass to Western Asia and Europe at the beginning of the Thirteenth Century marked a significant stage, for the first time permitting accurate directions for navigation. The magnetic compass had existed in China for a number of centuries before, but it was only late in its history that it came to be used for navigation at sea, sometime between 850 and 1050. The Chinese were active in the Spice Route trade, although their junks were often sailed by Koreans, and the compass seems to have reached Islam and Europe at about the same time through nautical contact with China. The first mention of a compass in European writings occurred in 1190 and in Arabic writings about 1232.



▲ One of the maps from the Kitab al-rujari (*The Book of Roger*).



Recording Information

► Engraving depicting a Dutch printing office in the late 16th Century. It shows the various stages involved in printing a book, including the arrangement of the movable type.



▲ 8th Century wall painting from a cave temple on the Silk Route to the west of Turfan. It shows a Buddhist scribe at work.



Amongst the most important inventions in the history of civilization has been the art of writing for it has enabled people to make permanent records of their achievements and culture. It is also an important tool of trade: commercial transactions can be recorded, along with taxes on goods and produce. Indeed, it seems it was largely for this purpose that writing systems were developed in the first place.

This development occurred in about 3000 BCE among the Sumerians of Mesopotamia, now part of Iraq. It consisted of simplified pictures of objects, called pictographs. Independently, about a thousand years later, the Chinese also started to use a form of pictographs (characters) which is still the basis of the script they use today. However, in the West, a further innovation occurred around 1000 BCE, when the Phoenicians developed an alphabet. The Phoenicians, from what is now Lebanon, had an extensive trading empire around the Mediterranean. Probably as a result of their trading contacts, their alphabet became the foundation of many scripts still in use today. In Europe, the Greek and subsequently our Roman alphabet evolved from it. In Asia, it gave rise, through a script called Aramaic, to the Arabic, Hebrew and Indian-Brahmi writing systems.

Scripts were written on a variety of different surfaces but it was in China, in the Second Century BCE, that paper was invented. They kept the secret until 751, when the Arabs acquired the knowledge of paper-making from some Chinese captured at the Battle of Talas River in Central Asia. Soon Samarkand and Baghdad had important paper industries. For five hundred years, the Arabs in turn jealously guarded their secret from the Europeans, though they happily sold them paper at great profit. The first manufacture of paper in Europe was in the Twelfth Century in Spain, then under Muslim rule, but it was not until the following century that a paper industry was in full operation in Italy.

The invention and manufacture of paper directly paved the way for the invention of printing. Printing from blocks of wood onto paper first occurred in China in the Seventh Century CE. Buddhist monks were largely responsible for this as they needed many more copies of their sacred texts than copiers could produce. The earliest known printed book is the Buddhist *Diamond Sutra*, produced in 868.



▲ A page from a 10th Century copy of the Koran, Islam's most sacred text. It is written on paper, by then widely available in Western Asia.



◀ Two Buddhist monks using wood blocks to print religious texts in a monastery in the Everest region of Nepal. It is probably for this purpose that printing first developed in China.

Korea was the first country to which printing spread from China, around 700. From there it was introduced by Buddhist monks to Japan. In the mid-Eleventh Century printing by movable type also originated in China. Movable wooden type dating from about 1300 has been found in the city of Turfan in Xinjiang. It was introduced there from China following the Mongol conquest of the region. The Mongol armies passed on further westwards, overrunning Russia, Poland and Hungary from 1240 to 1242. It is possible that before he invented movable type in Germany in 1455, Johann Gutenberg had heard about its use further eastwards.



Weighing and Paying

If a record of trade was needed, so too was a method of describing the quantities bought and sold. The development of systems for measurement went hand-in-hand with the development of writing. The earliest use of balances was probably for the weighing of gold dust. This commodity was so precious that it needed very careful and accurate measurement. Because of the limitations of weighing gold only small units were at first needed. The standard unit of weight was the *shekel*, which was used throughout the Middle East, ranging in weight from 7.78 to 14.3 grammes. When larger weights were needed, the *mina* (25-100 shekels) was introduced and later the *talent* (weighing 60 minas).



▲ This is an early example of a Chinese banknote. The Chinese were the first to use paper money, in the 11th Century.

► Greek plate of the 6th Century BCE. The scene depicted shows balance scales being used to weigh silphium, a substance valued for its medical properties.

►► From its origins around the eastern Mediterranean, the use of the coin spread along the trade routes. This bronze coin of the 1st Century CE was minted in the Kushan kingdom of Central Asia. It appropriately features a Bactrian camel.



As early as 1350 BCE, Egyptian balances could weigh a shekel of gold to within an accuracy of 1 per cent. They were of the basic modern design, with a beam pivoted at the centre and carrying the object to be weighed at one end and weights at the other. The Roman steelyard, which is still used today, was a different type of balance in which the object being weighed was counterbalanced not by changing a weight at the other end of the arm, but by moving a fixed weight along the arm.

These balances and ones similar were used by traders in towns and ports up and down the Silk and Spice Routes. At first goods and services would have been exchanged by barter, swapping one item for another. Types of items being exchanged were developed into forms of currency, such as measures of grain, lengths of silk or, more commonly, bars of metal, such as copper. In many societies small amounts of metals were used as a medium of exchange as they were long-lasting, could be carried easily and could be seen to have a value according to their size and purity. The importance of weight in early currencies is preserved today in such words as 'pound', 'lira' and 'rouble', all units of weight.

Some time in the Eighth Century BCE the Lydians of Western Asia Minor (modern Turkey) began stamping pieces of metal and guaranteeing their quality and weight. The use of coins quickly spread among the Greek merchants of Ionia who traded along the coast of Asia Minor. They in turn brought the idea to mainland Greece where the technique of stamping flat, circular and two-sided coins developed. Gold and silver coins now helped inter-regional trade while other, less valuable copper coins enabled farmers to sell their produce rather than barter them. This led to a greater flexibility within trading networks, increasing efficiency and productivity all round. Eventually, gold and silver coins were used throughout the trade routes.

Later, the use of paper money, first developed in China in the Eleventh Century CE, was adopted by the Mongols after their conquest of China in 1264. They introduced the idea throughout their massive empire, including the lands of Central Asia and Iran.



◀ Gold coin minted around 1st to 2nd Centuries CE by the Kushan king Wima-kadphises. The Kushans controlled a large empire in Central Asia from 1st-3rd Centuries and greatly encouraged trade on the Silk Route.

▼ A superb bronze weight in the form of a human bust, attached to a Roman steelyard scales.

