

The Chinese Invention of the Compass

The exact history of the compass, like that of gunpowder, is uncertain. The fact that house foundations in the recently excavated capital of the earliest historical Chinese dynasty, the Shang (1766-1123 B.C.), are laid out according to magnetic north suggests a possible knowledge of magnetism at this early time. The first definite reference to magnetism, however, is found in a Chinese book completed about 240 B.C., which describes the lodestone as a stone that "summons or attracts iron." This statement and certain others in the same book may indicate Greek influence upon Chinese thought, coming through the Asiatic conquests of Alexander the Great. Thus there are hints of a knowledge of the lodestone in the works of somewhat earlier Greek writers.

A clear description of the magnetic compass itself, as distinct from the lodestone, occurs only about 1300 years later. It is found in a Chinese book written by a certain Shen Kua (A.D. 1030-94). His book contains a passage describing geomancers, a kind of fortuneteller long employed in China to determine the luckiness or unluckiness of proposed sites for buildings, graves, and other monuments. Shen Kua writes that such geomancers pursued their art by rubbing a lodestone against a steel needle, thus causing the needle to point south. (South is the primary direction for the Chinese, just as north is for us.) Such a needle, he adds, can then be floated on water, or, best of all, can be suspended from a thread. Shen Kua notes further — and this is remarkable — that the needle never points exactly to true south, but always deviates slightly. The knowledge here shown of the principle of magnetic deviation proves almost certainly that the compass had been long known and studied by the Chinese before Shen Kua's time.

In Shen Kua's description the compass is used only for magical purposes. In a Chinese book probably written shortly before 1125, we find the earliest clear account of the compass as used for actual navigation. The book describes the sea trade between China, the South Seas, India, and Western Asia. Since the Arabs played an important part in this trade, some people have thought that the Arabs rather than the Chinese first applied the invention of the compass to navigation. However, the earlier development of the compass in China itself, and the fact that the earliest references to it in Arabic literature are later than 1125, make it seem unlikely that the Arabs were its first users. What seems most probable is that the Arabs, coming to China in their ships, learned there of the Chinese methods of sailing by compass, and in their turn introduced the compass into Europe.

In Europe the compass is first mentioned in a French poem of 1190, but its application to navigation is mentioned only later. It was not until the fifteenth century that Europeans came to understand the principle of magnetic deviation about which Shen Kua had written some four hundred years earlier.

The Compass

Before the compass was invented, travel by ships over long distances was not possible, because sailors had to navigate using the stars, a feat which was impossible during the day (and even on cloudy nights). Some exceptionally skilled navigators, such as the Polynesians, were able to get around these difficulties. But for most shipping, the Chinese solved these navigation problems by inventing the the first compass sometime between the 9th and 11th centuries. The Chinese compass was made of lodestone, a naturally-magnetized iron ore, and allowed captains of ships to always know where they were going.

Soon after its invention, China's compass technology passed to the rest of the world through nautical contact. The compass drastically increased sea trade and contact between cultures, ushering in the Age of Discovery. Without the compass, who knows how long it would have been before ships could have been widely used?