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**ASSIGN  
BUSTER**

The Arabs, who seem to have derived their knowledge of the magnetic needle from the Chinese, introduced the invention into the Mediterranean about the time of the Third Crusade, and such crusaders as returned safe to their homes in different parts of Europe brought back accounts of the wonderful needle. It would appear, however, that the compass used by the Arabs was rather a temporary resource in time of emergency than an instrument in continual use. They fixed the needle on a light straw, so that it floated on a basin of water, and after agitating it with a loadstone found that it pointed north and south. Such an arrangement would be seriously disturbed in rough weather, and in fact the compass did not achieve its greatest results, until it had attained a more stable form.

It was an Italian, called Gioja, who in the beginning of the fourteenth century made the great improvement of placing the magnetic needle on a pivot in a box so suspended as to remain always in a horizontal position. So great was the practical advantage of that change that Gioja is often regarded as the inventor of the compass, in spite of the fact that it was known to the Chinese thousands of years before. When the use of the box compass had become familiar in Europe, the work of discovering new countries went on by leaps and bounds, until it culminated in the discovery of America in the end of the fifteenth century. No one who considers the disadvantages under which ancient navigators laboured will be surprised at the limited extent of their explorations.

The wonder rather is that without the help of the compass they effected as much as they did. They confined themselves for the most part to coasting voyages, sailing through the day and anchoring their ships at night. In cloudy

weather, if they were out of sight of land, they had nothing to guide their course.

It must have often happened that in storms their ships were driven to unknown lands, from which, without the help of a compass, they had great difficulty in returning, and which they had no certainty of finding again, if they started on a second voyage to look for them. It says much for the enterprise of the old Greek and Phoenician sailors that, in spite of these difficulties, they thoroughly explored the greater part of the Mediterranean Sea, and made commercial settlements at different positions along the coasts. The Phoenicians sailed round Spain and traded with Britain, which was then regarded as the end of the world, and they are even said to have once circumnavigated Africa. But the discoveries made before the invention of the compass, however wonderful in themselves, are as nothing when compared with the vast regions that have added to the civilized world since the mariner's compass became the familiar guide of ships sailing over the sea. When we think of how the use of the compass has brought Asia and Europe into close commercial intercourse, opened up America and Australia to civilization and progress, and left no considerable portion of the globe unexplored. We are overwhelmed with astonishment at the immense effects produced by the discovery of the properties of such a tiny and insignificant looking object as the magnetic needle.