

of a bay or river. The dotted lines show the proposed ranges or courses of the sounding boat. In going back and forth over the space to be sounded, the boat is steered in straight lines by the aid of signal poles and targets, previously set up on shore, at regular distances apart. This is very important, for it enables the boat to be steered over the entire space, in regular lines, and thus makes sure that no considerable area be omitted. On the main land and some miles to the westward is a church tower, visible for many miles at sea. On his outward run, or in returning toward the shore, the pilot so steers the sounding boat as to keep one of the target poles in a line with the church tower, and thus insures a straight course.

To locate each sounding at its proper place on the chart, the following process is carried out: The sounding book may show that a depth taken and recorded at 10:45 o'clock was 10.5 feet. Transit book A may show that the angle or position of the boat at that hour and minute was south 9 degrees and 15 minutes west. Transit book B shows the angle from station B at that time was south 42 degrees and 10 minutes east. If these two courses or angles be now traced on the chart, from stations A and B, the lines will intersect at C, which was the true position of the boat. We make a dot there, and set down 10½ feet.

This way of locating a distant object, by the measurement of angles, is remarkably rapid and exact. The boat may be four or five miles from the shore, yet its true position may be laid down on the chart as exactly as if it were possible to walk out to it and measure the distance with a chain. The boat need not stop at all, but usually proceeds at a slow speed, taking soundings at the rate of four every minute or 240 per hour. To follow the course of the boat with the transit, reading and recording every angle and the time, will keep two men at each station very busy indeed. They will scarcely have enough spare time to brush away a mosquito.

In an ordinary harbor, many thousand soundings are taken, and they are all entered on their proper place on the chart, showing the depth of water everywhere. In this condition the chart will have its water area covered with figures, about as close as they can be written. The contour lines are now drawn, connecting spots of nearly equal depth. They represent the edges or outlines of areas of bottom of that average depth of water, and they curve about in the most unaccountable way. Spaces of equal depth are colored or shaded by a system of fine dots, and so outline the reefs and shoals. The character of the bottom will be indicated by the words sand, shells, rocks, mud, hard, soft or sticky. Specially dangerous places are marked by buoys as well as the main ship channel. The channel buoys are of a standard shape and color, and mark the way as plainly as the signboards on the country roads. Indeed, they are the only signboards the sailor has, unless he is very familiar with that locality. The professional pilots get so familiar with their harbor that they seem to develop a special sense, and readily find their way on the darkest nights.

Shoals are composed mainly of sand, and are creatures of the current. These drifting particles are carried along by the moving water, but settle to the bottom as soon as the flow becomes too slow to keep them in motion. Therefore, if anything should cause a variation in the current by diverting its usual course or increasing its speed, the drift material of the bottom begins to be cut away and moved along by it, forming an addition to some shoal further along or building up an entirely new one. Where a river empties into the sea, its outlet is usually much broader than the stream higher up; hence the volume of water flowing through the wider outlet has its speed of flow much reduced. This causes the particles of drifting sand and mud to settle to the bottom, and results in the formation of a bar or line of shoals, partially closing the outlet. They sometimes form islands or delta, as at the mouths of the Nile and the Mississippi.

At some places it has been found practicable to make the current carve out its own channel by diverting its course or narrowing its bed. This is usually done by jetties, which are artificial barriers, usually of stone work, to increase the speed of the current at that place. In such cases the drift matter is transported by the water further out into deep water, where it will be out of the way.

It is said that all the characteristic features of the country, constituting what we call scenery, are the result of erosion. The action of the rain, snow and frost serves to carve into other forms the surface of the earth, and may result in the total change of the appearance of a place

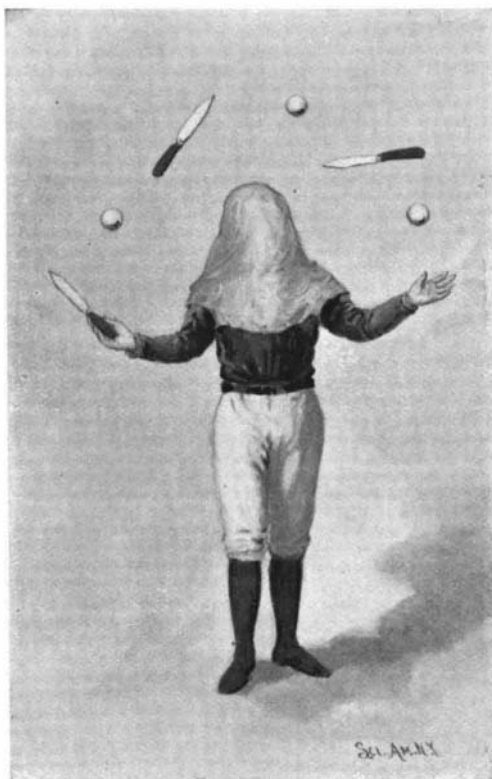
within a century or less. The erosion of the bottom of all flowing streams takes place much more rapidly. The shoals are liable to shift their position without any apparent cause, making frequent surveys necessary, so that these aids to navigation may be kept up to date.

Without such careful work as is done in our waterways by the government engineers, the vocation of those who have occasion to go in or out of our harbors would be perilous indeed.

THE BLINDFOLDED JUGGLER.

BY W. B. CAULK.

While watching the clever manner in which a good



THE BLINDFOLDED JUGGLER.

juggler passes various articles from hand to hand, how many people ever give a thought to the many hours of practice devoted to even the simplest trick that he performs? To become even a passable juggler, many weary months of constant practice are necessary. There are tricks in all trades, and some of the most successful entertainers in this line can scarcely do a half dozen genuine feats of juggling, yet they are great

favorites with the public. It has been truly said that "the tricks that require the most practice are the least appreciated by the average spectator." It is my intention merely to show how a simple trick has won fame for several well known jugglers.

This is the trick of juggling blindfolded. An assistant tightly binds a heavy handkerchief over the juggler's eyes, and then, to make sure that he cannot see, there is placed over his head and shoulders a sort of bag, made of heavy goods, which should exclude all light, even if his eyes were not tightly bound with the handkerchief. Regardless of this, the juggler performs the usual passes with balls and knives. Yet, when the bag is removed, the bandage over his eyes is found undisturbed.

This is most simple. The bag is made of the usual coarse bagging, and a few threads are pulled out of the part that will come in front of the juggler's face when the bag is over his head, thus allowing him to see between the remaining threads as though looking through a coarse screen.

When the bag is being placed over his head, and during the seeming effort of passing the arms through the armholes in the bag, the performer or assistant has no trouble in pushing the handkerchief up from the eyes to the forehead, thus allowing him to see through the open work of the bag. In removing the bag after the act there is no trouble in pulling the handkerchief down over the eyes.

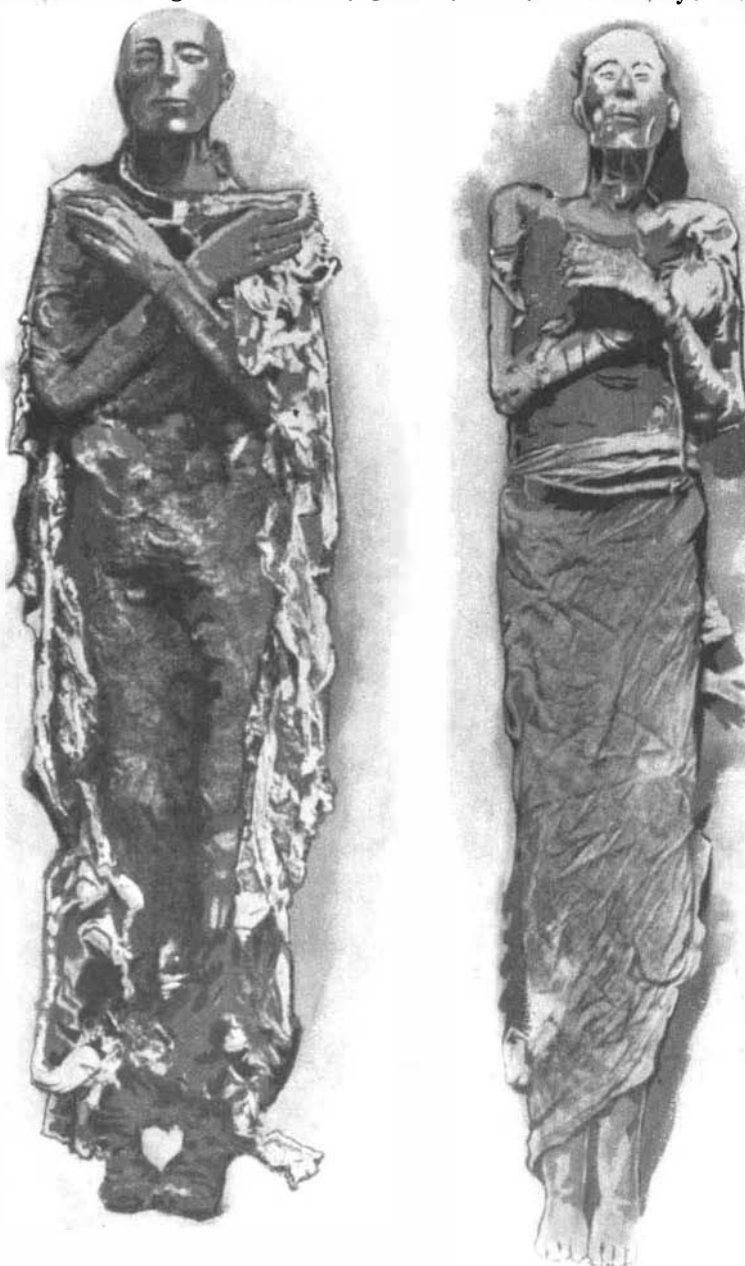


THE ILLUSION EXPLAINED.

RAMESES THE GREAT.

Of course nothing is easier than to talk cheap platitudes before the spectacle of a monarch's corpse, and not a few writers have made capital of a sort by contrasting the history of Rameses II. with those mummied bones of him now lying in the Gizeh Museum. For my part, says Mr. Eden Phillpotts, in *Black and White*, these human remains of famous Pharaohs caused me some indignation thus seen exposed behind panes of glass. Why, because a great one happens to have perished some few thousands of years, should we desecrate his dust in this fashion, and treat it as a peep show? And great beyond question was Rameses II—a man of genius, the first ruler of his time, one who at ten years of age sat in the state councils of his father at Thebes, who reigned at twelve years old, who at seventeen led conquering armies against the warlike Lybians. "Thou wast a ruler of this land when thou

wast still in the egg," declares the famous inscription on the walls of the Medinet Habon temple. "Thou didst act with wisdom, didst speak even in childhood for the land's weal." At an age when our young men are just passing to the universities, into the services, or through some other portal leading to life's battle, the second Rameses had made his power felt throughout ancient Egypt and the civilized world. He filled the throne for sixty-seven years, passing as an old man of about eighty from the scene of his remarkable life. His works were manifold. The Egypt of his day won a thousand industrial advantages from his energy and foresight. He built great treasure cities, developed the canal system, improved agriculture, advanced his nation's welfare, extended her borders, and loomed a colossal power through nearly three generations of mankind. His name was whispered next to the gods of the land. He appeared no less than a manifestation of deity to the masses. That he had many faults is certain, in that he was a man; but there can be no shadow of doubt that the soul of one of the giants of earth inhabited the small frame of Rameses the Great, and thirteen hundred years and more before the beginning of the Christian era his was certainly the greatest name on earth. To-day his ashes lie in a glass case, and for a few piasters any eye may behold them. In the hall of the royal mummies at the Gizeh Museum do "the dead lift up their voices and tell the tale of their whole life," to quote words of Renan. Here lie the bodies unearthed at Thebes in 1881 by Mariette Bey, and the collection includes a king and queen of the 17th dynasty, five kings and four queens of the 18th dynasty and three successive monarchs of the 19th, these last being Rameses the Great, his father Seti I, and his grandfather. The 20th dynasty has no representative, but belonging to the 21st are two kings, four queens, princes, a princess, and sundry priests.



SETI I. AND HIS SON RAMESES II., GIZEH MUSEUM.