

TRANSPORTING THE 16-INCH GUN TO SANDY HOOK.

After over half a decade being spent in its construction, the new army 16-inch gun has at last been completed and shipped from Watervliet Arsenal to the Government Proving Ground at Sandy Hook. The task of moving this great piece of ordnance was no easy one. The gun itself weighs about 300,000 pounds, and during its construction about 68,000 pounds were removed from the rough forgings in the process of turning down and boring out the various tubes, hoops, etc., of which the gun is built up.

This unwieldy and somewhat out-of-date piece of ordnance was designed for sea-coast defense. The Endicott Board, in providing a general scheme of sea-coast defenses for the United States seaboard, proposed that in addition to a large number of breech-loading rifles of smaller calibers, the defenses of New York should include no less than eighteen of the 16-inch guns. It was also proposed to mount ten of these guns at San Francisco and four at Hampton Roads. The piece which is now at Sandy Hook was constructed as a test weapon, the intention being, if this should prove satisfactory, to push through the completion of the other guns. Although in England and Italy there are to be found guns of somewhat larger caliber than this, they are not so powerful. The Italian gun of 17.75 inches caliber throws a projectile weighing 2,000 pounds, with a muzzle velocity of 1,700 feet per second, and a muzzle energy of 40,000 foot-tons. The English Armstrong gun of 16.25 inches caliber throws an 1,800-pound projectile with a muzzle velocity of 2,100 feet per second and a muzzle energy of 51,000 foot-tons. The new 16-inch gun of the army was originally designed to be fired with the old brown powder. It is calculated with a powder pressure in the chamber of 37,500 pounds per square inch, the gun will throw a projectile weighing 2,370 pounds, with a muzzle velocity of 2,300 feet per second, and a muzzle energy of 88,000 foot-tons; but in the forthcoming tests of the gun at Sandy Hook, the actual velocity secured will depend upon the particular quality of powder that is used. In any case, the results of the trial will be watched with great interest by artillerymen, not only in this country but throughout the world.

It will be seen from the accompanying photographs that the gun does not differ in external appearance from the standard, heavy, breech-loading rifles of our army. It consists of a long inner tube, a heavy jacket inclosing the tube and extending from the breech to a distance of about 6 feet beyond the trunnions, a series of chase hoops reaching from the jacket to the muzzle, and the jacket hoops which inclose the jacket and extend from the breech for about one-half the length of the gun. From breech to muzzle the gun measures 49 feet 3 inches; its diameter at the breech is 5 feet, and at the muzzle 2 feet 4 inches. The projectile is 5 feet 4 inches in length and 16 inches in diameter, and it weighs 2,370 pounds. With a velocity of 2,300 feet at the muzzle, it will penetrate 42.3 inches of steel.

Major J. M. Ingalls, for many years instructor at the Artillery School for Officers at Fort Monroe, Va., has calculated the trajectory of the projectile when the gun is given an elevation of 40 degrees, and the velocity at the muzzle is 2,300 feet per second. The extreme range would be 21 miles, and the maximum elevation obtained by the shell in covering this distance would be 30,516 feet. That is to say, if Mont Blanc were placed upon Pike's Peak, the 16-inch shell would pass entirely clear of the two mountains, and would descend to the earth at a point 21 miles distant. To further show the great theoretical range of this piece, we may suppose the gun to have been set up at the Battery, New York, and mounted in a carriage which would allow of an angle of elevation for firing of 40 degrees. If the gun were fired to the north, it would throw its shell considerably beyond New Rochelle on the Sound, while Tuckahoe and Hastings on the Hudson could be bombarded. The circle of its zone of fire would include

Hempstead and Long Beach on Long Island, while to the southwest it could throw its shells half a mile beyond the Atlantic Highlands. Keyport and Perth Amboy, Westfield and Millburn in New Jersey, would be within reach, while its huge projectiles would pass far overhead above Orange, to fall some seven miles distant in the valley beyond.

In transporting the gun to Sandy Hook, a special car with very heavy trucks was prepared to take the



TRANSFERRING THE GUN FROM THE CARS TO THE 250-TON FLOATING DERRICK.

gun to tidewater on the Hudson River. Here it was transferred to the deck of a large floating derrick owned by the Merritt-Chapman Wrecking Company. The lifting capacity of the derrick is 250 tons, and consequently there was a wide margin over the weight of the gun, which is, as we have stated, about 300,000 pounds. The gun was then towed down the Hudson River to the Erie Basin, and from thence to the government wharf at Sandy Hook, which had been specially strengthened for its reception. Here the gun was transferred to its special car, which had been brought down on the barge with the gun.

For the testing of the gun it will be necessary to provide a special mount. Just what kind of a mount will be used has not yet been determined, and, indeed, it is something of a problem. The heaviest guns at present in use in the army weigh about 64 tons, and

test of it may be, it is certain that its mate will never be built. The tendency to-day is toward the construction of lighter and longer weapons, with much greater rapidity of fire, with flatter trajectory, and firing high explosive shells.

Sverdrup's Discoveries.

The long dispatch sent by Capt. Sverdrup from northern Norway, says the New York Sun, conveyed no exact idea of the lands he found to the west of Ellesmere Land and Grinnell Land in the hitherto unexplored region north of the Parry Islands. Later information shows that Sverdrup discovered two land areas that are comparable in size with some of the larger known islands north of this continent.

He found, in the first place, that the south coast of Ellesmere Land extends some seventy miles almost due west of the point where it was supposed by Inglesfield to turn to the northwest. The south coast has, therefore, doubled the length heretofore represented. Sverdrup thinks the earlier explorers were deceived in mapping Cape Eden and the Victoria Islands on this supposed northwest coast by the mountains of Ellesmere Land peering above masses of fog.

The south coast thus extends nearly to the island of North Kent, from which it is separated by a strait about two miles in width. Northeast of North Kent Sverdrup found that Ellesmere Land is greatly narrowed by a very deep and wide bay penetrating far to the east. Following the west coast along the very winding shoreline he found a narrow channel about 200 miles in length, which washes the shores of northwest Ellesmere Land and southwest Grinnell Land on the east and a hitherto unknown shore line on the west. This new land, which may consist of two or more islands, extends about 200 miles north and south. Its western shores were seen for sixty or seventy miles north and south of the seventy-ninth parallel, so that the land mass in that region has an extension east and west across six degrees of longitude.

To the west of this large land and north of North Cornwall, the most northern land in these seas known up to the time of Sverdrup's explorations, another great land mass was discovered and a sledge journey was made clear around its coasts. It extends to the northwest from about the seventy-eighth to the eightieth parallel, or about one hundred and forty miles. It is oblong in shape, and its mean width may be seventy to eighty miles. Its coasts are deeply indented and it may consist of two islands.

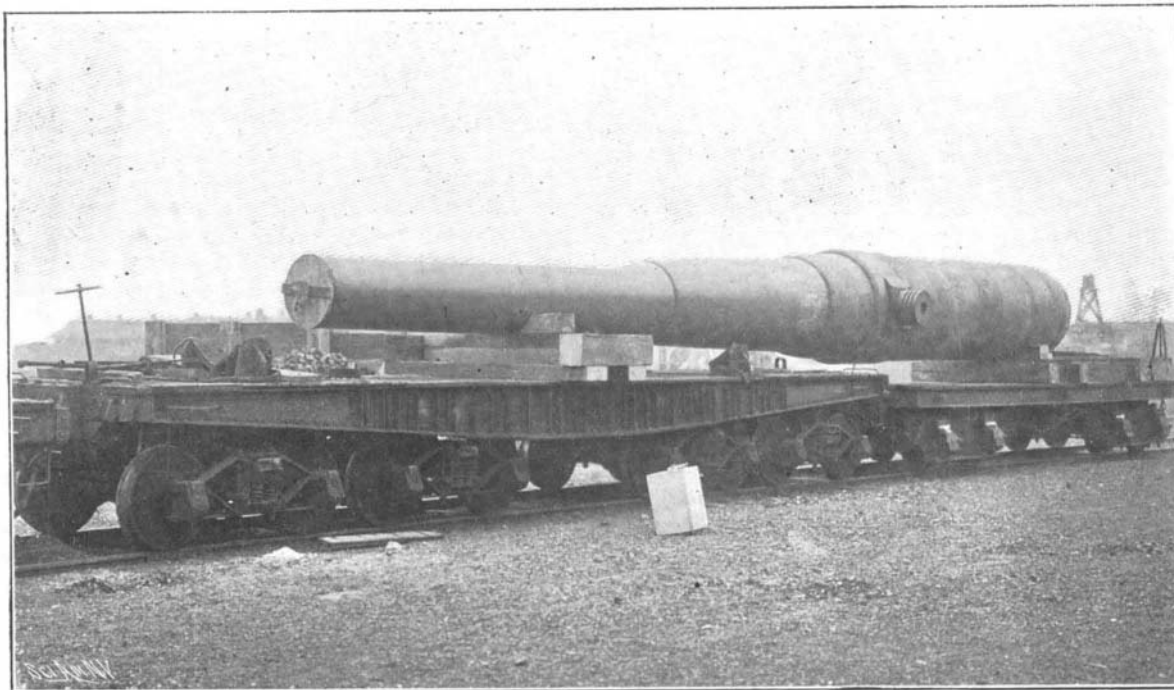
These discoveries show that land extends far to the north of the Parry archipelago, and that the new land masses are larger than any among that group of islands.

No land was seen to the north or west of these islands; but there is no ground for asserting that more land does not exist there, and that the American Arctic archipelago is not very much larger than the land areas thus far shown on the maps.

The British Admiralty committee on torpedo boat destroyers began an investigation on November 28 into the weakness of the backs of torpedo boats by making efforts to break the torpedo boat destroyer "Wolf" in half. The experiment is the most remarkable and, perhaps, the most costly ever taken for naval research. The cost of building the "Wolf" was \$1,250,000.

It is likewise designed to test the effect of wave action upon destroyers. The accident to the "Cobra" seemed to show that the back breaks when a

wave lifts the boat amidships, or when she is lifted in such manner that the wave is hollowed beneath her middle. The "Wolf" was alternately hung in the dock by the bow and stern in special cradles having no support amidships. Then she was hung by the midship section without the ends being supported. The result has not as yet been published. It goes without saying that the data secured will be of immense value in the designing of future destroyers.



THE 16-INCH GUN ON SPECIAL CARS FOR TRANSPORTING FROM THE ARSENAL TO THE HUDSON RIVER.

it will be understood that a piece of more than double that weight, with considerably more than double the energy, will require a very special mount for testing. It has been suggested that the mounting used in the test of the Gathmann gun might be remodeled for the purpose; but we fail to see how this could possibly be done. As a matter of fact, the development of modern ordnance has been so rapid that the 16-inch gun is quite out of date, and however successful the