

**GREAT SUBMARINE BLAST IN SAN FRANCISCO BAY.**

After several weeks of preparation, Shag Rock, one of the more prominent of the obstructions to navigation in San Francisco Bay, was successfully removed on the 30th of last month. The rock, well known to every navigator of that harbor, was located about a mile northwest of Alcatraz Island, and directly in the course of all vessels navigating the waters of the upper bay. It has been the scene of numerous wrecks. At high tide the summit was almost submerged, only a small point being visible; but at 30 feet below low water its base spread out in oblong shape to a diameter of over 180 feet. The shoal thus formed and the strong tides and currents at this part of the bay made the rock a menace which every navigator was anxious to avoid. The government has been urged to remove this rock for years, but not until the past twelve months has a systematic and accurate survey been made. A contract was then made whereby Arch Rock, Shag Rock, and Shag Rock No. 2 were to be obliterated inside of two years at a cost of \$232,000.

Shag Rock was the first to be attacked. A frame, 180 feet in diameter and revolving about a huge mast, was put in place (see SCIENTIFIC AMERICAN, March 24), and from this platform, driven by power from a floating barge, drills nine inches in diameter were set to work, and inside of a month thirty holes were bored vertically into the rock to a depth of 34 feet below low tide. These were filled with explosive gelatine and connections made with an electric battery preparatory for an opportune moment for the explosion. Altogether nearly two tons of explosives were tamped into the rock.

When the time arrived, the bay in the vicinity was cleared within a circle of a mile, and the wires attached to a battery on board a barge anchored 6,000 feet away.

The time arrived, and after a signal from the barge the electric button was touched and the powerful explosive was ignited. Then was afforded a magnificent spectacle. There was very little sound, and scarcely a tremor was felt; but there arose a mighty geyser from the bosom of the sea, which ascended to an altitude of 1,000 feet, with branches extending at various heights, and gradually drooping as the huge mass of rock and water poised in mid-air, before falling from the dizzy height to which it had been hurled. There seemed to be but one explosion, and all was over in a few seconds. The waters soon became calm again, and signs of disturbance quickly vanished. Only the splintered wreck of the platform and a few dead fish floating about gave indication of the mighty eruption. The result of the explosion, so far as ascertained, has been all that was anticipated. Soundings show a depth of 18 feet at the highest point. Tons of rock have been blown into deep water and all that remains has been shattered into small portions which can be easily removed by the dredgers.

M. EMILE LAURENT, professor of the Agricultural College of Gembloux, has recently made a series of experiments on the use of nicotine in horticulture. The administration now furnishes a solution of sulphate of nicotine of 10 per cent strength, and it suffices to add 10 cubic centimeters of the solution to a liter of water in order to have a very effective insecticide solution. M. Laurent has, however, remarked that the liquid used in the ordinary manner adheres very imperfectly to the different insects, and

proposes to make it more adherent by adding strong soap and carbonate of soda in the proportion of 10 to 1. The solution thus prepared has given satisfactory results, and its effects is quite conclusive. M. Cornu, of Paris, has made known a process of which he uses the juice of tobacco for the same purpose. Iron bars are heated to redness and brought to the center of the

war vessel, which has a displacement of 11,500 tons, was constructed at the New Admiralty Yard at St. Petersburg, her engines being supplied by Messrs Hawthorne, Leslie and Company, of Newcastle-on-Tyne, and was launched in 1894, though not completed for sea till a comparatively recent date.

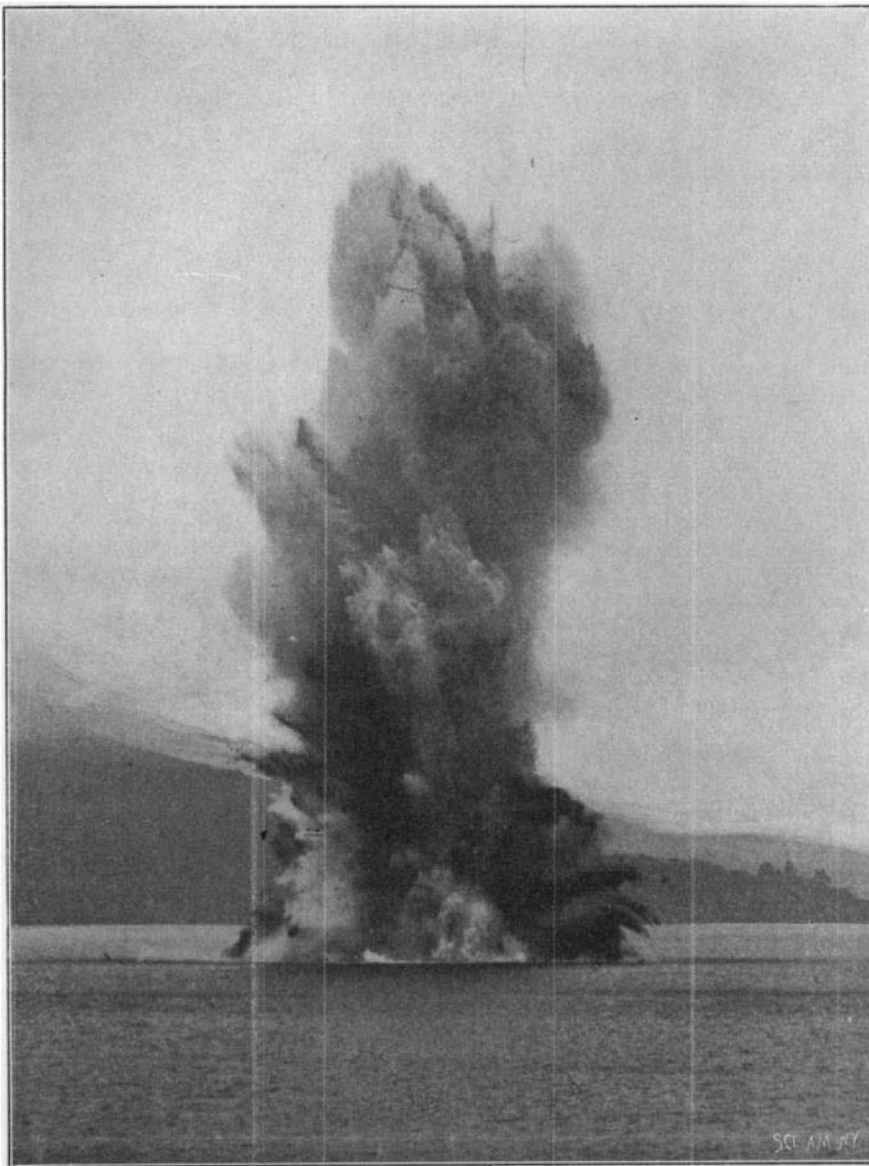
The "Petropavlovsk" is 367 feet in length and has a beam of 69 feet. She is provided with an armored belt over 15 inches in thickness, and a protective deck of 3.5-inch armor. Her two principal turrets are covered with 10-inch Harveyized steel plating; her four secondary ones and her casemates being of 3-inch armor. Her armament is a very formidable one consisting, as it does, of four 12-inch cannon mounted in pairs, fore and abaft her superstructure, and twelve 5.9-inch quick-firing guns eight of which are placed two together in her four secondary turrets, the remaining four being in casemates recessed on her main deck amidships. Besides these she carries no fewer than thirty-eight small rapid-fire and machine guns in addition to six torpedo tubes. Her machinery, of 10,000 horse power, consists of two sets of triple expansion engines supplied with steam by fourteen single ended boilers. On her trials the "Petropavlovsk" under natural draught realized a speed of about 17 knots an hour during a twelve-hour run. Her crew consists of 600 men and 22 officers, and she is now commissioned for the first time, and no doubt will be a most valuable addition to the important squadron that Russia maintains in the Far East.

The "Petropavlovsk," with her black hull and upperworks, against which her white turrets stand conspicuously out, her three masts (or rather two and a half) with their array of electric light projectors, her lofty funnels and recessed stern-walk, presents a somewhat unique appearance when contrasted with the warships of other nations. Doubtless, though, on the first hint of hostilities she would receive a "fighting jacket" of dead black or lead-colored paint.

#### Thomas Jefferson's Account of a Screw Propeller.

A correspondent from the University of Virginia sends us an extract from a letter of Thomas Jefferson, dated Paris, October 2, 1785, written to his scientific friend, Bishop James Madison, of William and Mary College, which illustrates Jefferson's well-known interest in scientific matters, besides being important as it contains a reference to the introduction of the screw-propeller: "I went some time ago to see a machine which offers something new. A man had applied to a light boat a very large screw, the thread of which was a thin plate, two feet broad, applied by its edge spirally around a small axis. It somewhat resembled a bottle brush, if you will suppose the hairs of the bottle brush joined together and forming a spiral plane. This, turned on its axis in the air, carried the vessel across the Seine. It is, in fact, a screw which takes hold of the air and draws itself along by it, losing, indeed, much of its efforts by the yielding nature of the body it lays hold of to pull itself on by. I think it may be applied in the water with much greater effect, and to very useful purposes. Perhaps it may be used also for the balloon."

MR. M. H. SAVILLE, of the American Museum of Natural History, has returned from a very successful trip to Mexico. The explorations at and near the noted ruins of Mitla have been so well prosecuted that little work is left to be done.



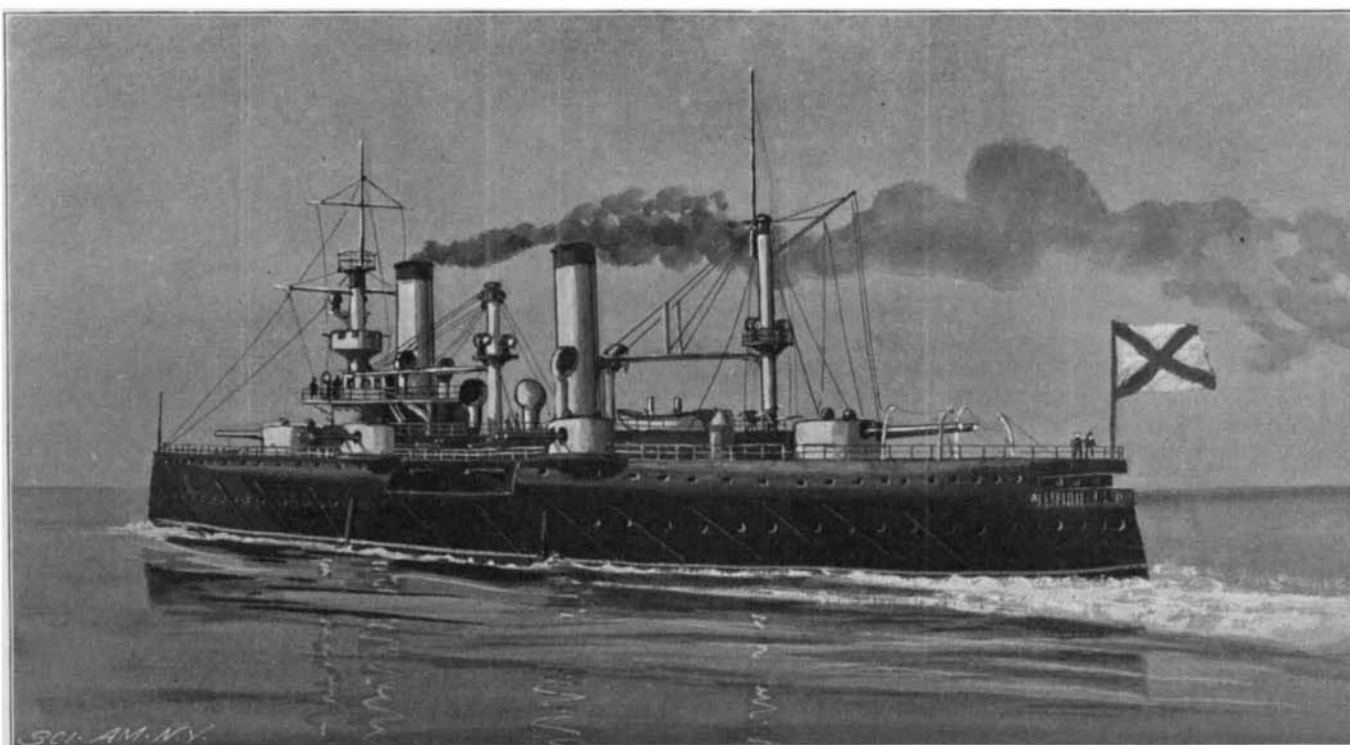
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#### Observed Height of Column, 1,000 Feet. BLOWING UP OF SHAG ROCK, SAN FRANCISCO BAY

greenhouse, where the solution is projected upon them; this is instantly transformed into vapor, forming a thick cloud, which rises to the top. It condenses and falls upon the different plants and the insects are quickly destroyed. When thus deposited upon the leaves, this product has no harmful action upon the pores.

#### THE NEW RUSSIAN BATTLESHIP "PETROPAVLOVSK." BY C. FIELD.

The Russian navy, already formidable, still continues to grow apace. One of its most recent armorclads is the "Petropavlovsk" at present performing the duties of flagship on the Pacific Station. This fine



Displacement, 11,500 tons. Speed, 17 knots. Normal Coal Supply, 900 tons. Armor: Belt, 15-inch; deck, 3.5-inch; main turrets, 10-inch; Secondary turrets, 8-inch. Armament: Four 12-inch B. L. R., twelve 5.9-inch R. F., thirty-eight smaller R. F. and machine guns. Torpedo Tubes, 6. Completion, 1899. Date, 1899.

#### NEW RUSSIAN BATTLESHIP "PETROPAVLOVSK."