advantage of an increasing over a uniform spiral, which necessitate the concentration of rotating effort upon a single weakening ring of studs. So long as we admit the fantastical hypothesis of an increasing spiral, of which the "practical importance has not been decided by practical experiment," the "Woolwich or service system," must, in the words of Admiral A. Cooper Key, C. B., F. R. S., when director of naval ordnance, "retain the disadvantages of a grooved gun and studded projectiles." And so long as "hard projectiles having studs" are employed, whether with an increasing or with a uniform spiral, "there will generally be a slightly oblique movement of the axis of the projectile," and with it a loss of power by its misapplication within the gun. Moreover, as witnessed in the *Glatton's* trial on the breaking up of the projectile through the weakening stud holes, and in the brassy grooves cut into the armor by the studs, there must also be a loss of perforating force due to these weakening agencies, irrespective of the power lost within the gun. The whole of these evils would be obviated by the employment of long bearing centering iron ribs, cast upon and with a projectile, strengthening its walls and requiring fewer, shallower and narrower grooves in the gun. A system which in the 7 inch gun competition of 1863, —5 gave higher velocities, lower trajectories, heavier muzzle blows, and, above all, greater endurance, both to the gun and the projectile. All this was attained at much less cost, and with much greater simplicity. With the *Devastation* class of ships, each costing some £400,000, limited to the employment of four guns, the first of which was disabled by its own French rifling at the 68th discharge from a cool chamber, the question cannot be said to have reached "finality." The point must be reopened and that soon. It behooves, then, the United Services to study the difficulties of the case; neither discouraged by the lazy cry of "finality" on the one hand, nor by the angry inuendos of partizans on the other. The struggle lies between economy, strength, simplicity, long rifle bearings, and perfect centering on the other side; and expense, frailty, mixed metals, short rifle-bearings, and non centering on the other. Let us honestly endeavor to discover experimentally which system will give the most work with our well built guns. From all the official records I have studied I have no hesitation in affirming that the existing experience is in favor of the simple, inexpensive, and strong long bearing, and against the expensive complicated, short-bearing. But let an open inquiry be publicly instituted as to the past experience, and let a fair trial be made, and as a ruined officer, whose professional character is the only possession left to him, I have no hesitation in staking my reputation that the country and the country's service will gain immensely by the victory, which, I feel assured: common sense will thus gain over obstructive partisanship. —*Broad Arrow.*

EGYPT AND ABYSSINIA.

The *Daily Telegraph* has published the following telegram from a correspondent at Suez, dated August 3:—

"News has reached this place from Massowah that an expedition of 2,000 Egyptian soldiers, with Remington rifles, mitrailleurs, and cannon, on July 1 seized the Abyssinian provinces of Bogos, Hulhal, Bejuk, and Mana, by order of the Viceroy, in accordance with the solicitations of the Government at Constantinople. The Swiss Munzinger Bey, Governor of Massowah, has command of the expedition, which has been conducted with great secrecy. It is stated that the conquest of Abyssinia can be completed in three weeks by the Egyptian troops in Bogos. The Emperor Kassai marches on Addoé with 10,000 men, and it is rumoured that he demands the surrender of the Egyptians and their cannon. It is thought however that Kassai can do nothing, as he has no adequate arms, and it is feared that all Abyssinia will fall, and Munzinger be named king. The pretext of the movement is the necessity of taking charge of the route between Massowah, on the Red Sea, and Bogos, along which civil war and highway robbery have made travelling impossible. The Abyssinian Queen, Mestiata, it is stated, asked the Viceroy's protection against Christains, upon which the king of Shoo, being greatly enraged, made her prisoner, and she is now in his hands. The Egyptian troops will next attack Magdala, and to effect the capture of this stronghold three thousand more men are expected from Suez. Several European adventurers have joined the force in order to share the spoil. The whole scheme, in fact is contrived to secure to Egypt and a number of adventurers the profit and plunder before Europe becomes fully aware of what is going on, or can take steps to interfere. Bogos pays tribute to Abyssinia, and its neutrality is, I understand, guaranteed by Great Britain."

SEA-GOING IRONCLADS.

In the current number of *Colburn's United Service Magazine* is an able article on mastless sea going iron clads. Glancing at the reasons for anticipating that the mastless type will prove successful at sea, the writer observes:—"After the *Devastation* has been tried probably in the autumn of this year, the question will be set at rest; but there need, we think, be little fear of anything but a satisfactory result. From the estimates of her initial stability or 'metacentric height,' and its comparison with the corresponding values in very steady ships like the *Monarch* and *Hercules*, it appears practically certain that she will also prove a remarkably steady gun platform, enabling her guns to be fought with accuracy, even in heavy weather. No comparison can be made between this type and the American monitors, although it has been much the fashion to argue that the supposed steadiness and good behaviour at sea of the *Miantonomoh* and *Monadnock* that the *Thunderer*, *Devastation* would also behave well. Nor should it be lost sight of that while American monitors have made ocean voyages, they have done so under convoy, and with their turrets so caulked up and blockaded to keep the water out that it would have been impossible for them to have fought even if the necessity had arisen. In short the American type is essentially fitted for fighting in smooth water, when the lowness of their decks and the nearness to the water of their guns is not objectionable, but rather advantageous. On the contrary our breast work ships are essentially fitted for sea service, and for fighting in the heaviest weather; their guns being carried high above the water, and their turrets always remaining in working order ready for immediate action. It appears most desirable that our armored fleet should include both mastless and rigged ironclads, the one kind being complimentary to the other, and the development of each requiring continuous and skillful application on the part of our designers so long as it shall be considered desirable to continue the use of armour plating on war ships. The recommendation of the Committee on Designs as to the discontinuance of the construction of first rate rigged ironclads appears unwise in view of the policy followed by other naval powers, and the necessity for efficiently protecting our world wide commerce, and our numerous transmarine possessions. Their scheme for local centres of naval power from which mastless ships could operate had been shown to be impracticable without great changes and vast expenditure besides being doubtful as a question of policy. Under present conditions to take their advice would be to throw their protection of our commerce mainly upon small ironclads and unarmored cruisers, and this does seem most undesirable."—*Broad Arrow.*

The Magdenburg *Gazette* says that the contemplated changes in the German army are to be hastened, so as to be carried out by next spring at the latest. After that date the German infantry will be armed either with the converted rifle, which is about equal to the Chassepot, or the Werder rifle, which is far inferior to it. By that time the conversion of the 400,000 chassepots captured during the campaign 1870-71 will, it is thus expected, also be completed, and the number of guns attached to the German artillery will again be greater than that of the French guns, as 32 new batteries will be formed.

The largest iron steamships ever built in America have just been ordered to be built at the Deleware River iron shipbuilding works of Messrs John Roach & Co., by the great Pacific Mail Steamship Company, being two ships each four hundred feet long and five thousand tons burthen. These vessels are to be placed on the mail line from San Francisco to China and Japan, under the new contract authorized by the last session of Congress, providing for a semi-monthly mail service instead of a monthly one.

The project of a railway for the transportation of ships across the Isthmus of Honduras, between Puerto Caballos on the Atlantic and the Bay of Fonseca on the Pacific side, is now urged in earnert, and a prospectus for "The Honduras Ten Per Cent. Government Ship Railway Road" has appeared in the London papers. The plan is to raise vessels from one ocean by hydraulic lifts and then transport them on a track across the Isthmus, after which it would be an easy matter to launch them into the water of the other ocean. The proposed railway track is to be twenty five feet wide, with twelve rails. A ship weighing with its cargo, two thousand tons, would be supported on two hundred and forty wheels, by which the weight would be so distributed that the pressure on each rail would not be excessive. The projectors of the company have figured out enormous profits for the enterprise, which they estimate can be carried through for the moderate sum of $75,000,000. For the use of this money they are willing to pay 10 per cent per annum.