

sons made with the 8 inch gun; and we may presume, would arise in other calibres. Moreover, the 12-inch projectile is balanced on two rings of gun metal studs about six inches apart, and equidistant from the centre of gravity, the effort of rotation being chiefly borne by one of those rings, thus bringing on them so great a strain that they are sometimes squeezed over the lands, or wrenched out of their sockets. A more ingenious arrangement for concentrating the effort of rotation on the smallest possible surface is hardly conceivable. Now, if we imagine that the gas escaping over the shell forced down its unsupported base and raised its point, we have an irregular motion set up, which might well force the soft studs out of the grooves and on to the lands, producing a momentary jam. Though such a check might not mark the gun, yet the squeeze would produce a severe local strain, and give time for a greater consumption of powder than usually occurs when the shot has advanced so little. Thus an unusual pressure would be recorded in the powder chamber, over and above what would arise when the shell is free to travel out of the gun.

Again, the object of all rifling is to give rotary motion on an axis parallel to that of the bore or coincident with the line of fire. In rifled small arms and with all expanding bullets, this coincidence of the two axes is a natural consequence of the whole cylindrical portion of the shot bearing against the bore. But in hard projectiles with studs there will generally be an oblique movement of the axis, and, as the soft metal wears away, all attempt to centre the projectile in the bore, fail. On the other hand, if the shot be furnished with iron ribs running along the cylindrical part, and arranged for rising up the groove, on firing so as to centre the shot in the bore, the axis of the projectile will coincide with that of the gun, and it will proceed as steadily along the bore as a lead bullet, and continue so throughout its flight. The grooving for such a center-iron ribbed projectile, would take much less metal out of the gun, each groove being only 8 inch wide, and at the deepest part .124 deep. As the whole length of the cylindrical portion of the shot would be utilized for the rib bearing, fewer grooves would suffice, and the surface removed for five such grooves would be only four inches, or one-ninth of the circumference of the bore, instead of one-third as with the present studied rifling: whilst the depth of each of the five grooves would be only three fifths that of each of the nine.

Had the projectile in the 35 ton gun been provided with iron centering ribs, cast along the whole length of its cylindrical portion, no irregular motion in the bore could have been set up, and no squeeze would have occurred, and had the bore been only weakened by its grooving to one-ninth the width and three-fifths the depth actually in use, the steel lining would have been more capable of sustaining such strains as might have been imposed; whilst these would have been divided over a much greater surface. Whether the unexpected tension of 66 tons on the square inch of the bore arose from the cause suggested or not, there can be no question, that a smaller depth, less width, and a less number of grooves would be less weakening to the lining; and that a bearing which spreads the effort of rotation along the whole cylindrical length of the projectile must be less straining than one which concentrates it upon half an inch. If the mishap to the "Woolwich Infant" led to a closer investigation into the strains incidental to the Service rifling, the £700

worth of damage will not have been incurred in vain.—*Broad Arrow.*

#### OPINIONS OF THE PRESS ON THE GENEVA ARBITRATION.

IMPERIAL PARLIAMENT—THE ALABAMA.—At the opening of the British Parliament on Tuesday last reference was made in the Queen's Speech to the Treaty of Washington; but after the manner of Royal Speeches, the reference was vague and unsatisfactory, and in the House, and in the Country, excitement is intense. It is charged against Imperial management, that the Americans have outwitted our Commissioners, and that in presenting what are called "consequential" damages, they are warranted in doing so by the treaty, and the protocols. Mr. Gladstone, simply expresses the hope that the Americans will recede from the position, and that the conference will be able to complete its work. Every English paper with one voice asserts the impossibility of England yielding to the American view, and the *Telegraph* extremely radical as it is, leads the resisting spirit. Having the seeming advantage, opinion in the Republic is less excited, but quite as firm; and Secretary Fish in instructing Mr. Schenck, repeats the President's instruction as follows:

"You are authorized to affirm that in no event will the Government of the United States recede from the position it has taken in relation to the Washington Treaty."

Although Mr. Gladstone will endeavor to ward off a direct expression of England's ultimatum in order to keep terms with the "peace at any price" party, it will be impossible for him to counsel the degradation of England, or advocate the acceptance of the American position. After looking carefully over the treaty and protocols, there is certainly nothing to prevent the Washington government from embracing the English view of the case, nor is there anything to bar the Americans from the right to make these claims a part of the work of the conference. It simply amounts to this, that England's rulers, so thoughtful of what others may say in respect to English liberals, and so anxious for undisturbed commercial supremacy, neglected those diplomatic niceties of detail, which would leave nothing to be understood. The case, as it stands, is not such as to permit indifference, although a year may pass before the arbitrators be called upon to agree or to differ, and the policy of both Governments will be to procrastinate—the American to assure the reelection of Grant—and the English to retain power. We have faith in the spirit of the British people—home and abroad, that they will resist at all hazards, a claim which if recognized in the least particular might be extended to imply compensation to every citizen of the Republic for asserted losses consequent on the continuance of the war. On the other hand, it is the duty of England the moment America has declared her intention to press for consequential damages to withdraw from the conference; choosing what alternative may follow, to national degradation. This game would only be the resort of a common foot-pad and must be resisted, come what may.—*Woodstock Times.*

THE DIFFICULTY WITH ENGLAND.—Up to the present moment it cannot be said that there has been any difficulty, nor that there is any cause to apprehend any difficulty. So far as the official communications between the two Governments are involved, everything is quiet, peaceable and pleasant. But it happens, unfortunately for the peace of the public mind on both sides of the Atlantic,

that in making up a case for presentation to the Court of Arbitration in Geneva, our own Government did put in claims for consequential damages, which Englishmen as sume was done for no other purpose than to irritate their feelings by preposterously claiming damages which no one could expect to have allowed. It was for the Arbitrators to decide whether the claims were admissible or not; and we were bound to accept their decision whether favorable to our claims or otherwise. But the English press, for the lack of some more exciting topic of discussion, thought proper to make a row about our claims for "consequential damages," and so worked upon the popular feelings by representing our claim as an insult, that it has become necessary for the ministry to take notice of the matter, and the result is a request to our Government for the withdrawal of the obnoxious claim. This, of course, will not be done, and it is not likely that the arbitration will continue its sittings, and we shall be left just where we were before the Joint High Commission met in Washington. There we can very well afford to await our opportunity. There will be no war, nor any talk or thought of war, until England shall find herself engaged in a conflict with some European power, and then we shall be at liberty to follow her example during our war, and Alabamas will be built here to prey upon her commerce. But England cannot afford to let the subject remain in abeyance until then, and therefore she will take some steps for effecting an amicable settlement of the difficulty. There will be no war, whatever else there may be.—*Brooklyn Union.*

THE WASHINGTON TREATY.—The English journals are working themselves into a state of great excitement over the case presented by the Washington Government to the Geneva Conference. The Americans with characteristic assurance, have presented enormous claims, asking for all sorts of indirect damages. They say the Treaty did not limit their claims. It only established a means whereby those claims could be considered and decided upon. They agreed with the English Government to abide by the decision of an impartial body of the arbitrators. They claim the right to present their case before that body in as strong a light as possible, and they have done so. That is the position of the American Government, and it must be admitted that looking upon it in the light of the treaty and negotiations which led to it, it is a perfectly tenable one. The British Government knew officially, at the time the treaty was assented to, that the Americans could claim consequential damages, and yet they ratified the treaty, and the London press, with a few exceptions, hailed it as the dawn of the millennium. And now, when the conference has met and these indirect claims presented, these same English journals get frightened, and cry out that the Government should demand the withdrawal of these claims, and if they are not withdrawn repudiate the treaty. The position of the British Government is indicated in Her Majesty's Speech in opening Parliament.—Referring to the meeting of the Geneva Conference she says "Cases were laid before the arbitrators on behalf of each party to the treaty. In the case so submitted by America large claims were included which were understood on my part not to be within the provinces of the arbitrators. On this subject I have caused a friendly communication to be made to the Government of the United States." Judging from the tone of the despatches from Washington, the American Government is determined to stick to the letter of the bond