

sity could only be insured by having the shot properly centred; but that a rapid twist was the best compensation for the want of centring although it was better to have a less rapid twist and more perfect centring for one reason, because it strained the gun and the projectiles less. Experiment he said had shown that the longest guns shot best, which he attributed to the less amount of knocking of the shot by the gas when it left the muzzle. Too much attention, he thought, had been given to centring in the bore itself, instead of insuring the projectile being centred as it left the gun for although the shot might be centred in the bore yet on leaving the muzzle a blow from the gas might destroy this advantage. A great many methods had been tried to secure accurate centring, and he pronounced Sir William Armstrong's system of lead-coating as the first and the best of them, and he objected to Sir J. Whitworth's plan of a taper base, because of the necessity of a semi-flat head. Except in the case of lead-coated projectiles he said that the Woolwich studs were strained to perhaps twenty tons per square inch; but he could not assign a superiority to any method over all the others, each having certain advantages and disadvantages.

The lecturer then suggested a system which he considered had all the advantages of those he had noticed. He proposed that sixty four narrow grooves should be cut in the shot, and the same number of lands in the gun, which supposing each groove to be two inches deep, an ordinary pressure in a 15-inch gun with a 1200lb. projectile, and a twist of one turn in forty calibre would be reduced to 700lb. per square inch which was the mechanical limit of pressure between surfaces in contact under friction, centring being obtained by the use of zinc studs. This system, he maintained, had the following advantages, viz, the shot did not cut into the bore of the gun, and therefore did not weaken it; it would not wear the grooves or waste probably $\frac{1}{4}$ per cent. of the longitudinal pressure of the gas, and could be used with both muzzle and breech-loading guns, and therefore, so far as the rifling is concerned, both gun and projectile were everlasting. He was assured on very able authority that the number of grooves in each shot could easily be cut by a machine adapted for the purpose in one operation. With chilled projectiles he proposed to cast the shot in a cylindrical casing grooved previously which would prevent the shot splitting in two on striking an iron plate.

Scoring, he suggested, would be prevented by using a wad in the rear of the shot, which would be easily cut into by the ribs in the bore, and so be the means of extending the endurance of our guns to ten or 20,000 rounds. He proposed that the gun for this system should be a breech loader, of which a model was presented for inspection the breech piece being literally the greater half of the gun itself.

The usual conversation followed, and the proceedings were terminated by a vote of thanks to the lecturer.—*Brenton Arrow* 24th May.

The Khedive of Egypt has engaged, in the event of war, to place half the army he may have at the time unconditionally at the disposal of the Sultan and fixes the smallest forces he could contribute at 15,000 men. If the Ottoman Empire were threatened with an invasion, the whole Egyptian army would take arms in its defence.

FALL FROM A BALLOON.

(Correspondence of the World.)

Ionia, Mich., July 5.—The great excitement of the Fourth of July in this town was to be the ascent of Professor La Mountain, the famous aeronaut, in his balloon, or "Mammoth air-ship." The people had flocked from all the neighbouring country to see so unusual an exhibition, and there were at least 10,000 people in and about the Public square, laughing and talking, eating nuts and fruit, and firing off their crackers, and enjoying themselves after the fashion of country people who are for an exhibition. The balloon—not one of the ordinary silken sort, but of that foolhardy pattern which originating with Mongolfier, should have ceased with him—was a paper globe, the elevatory power which was simply heated air. Yet the Professor, with his wonted coolness, was bustling about attending to preparations for the inflation, occasionally chatting with one or two of his acquaintances about the prospects of the voyage, of the favourable termination of which he apparently had not the slightest doubt. He had sailed in the air often enough to have no fears, and remembered not the proverb about the pitcher which went once too often to the well. For some time the boisterous wind delayed the ascent, but half an hour before starting the balloon swelled bigger and bigger, and tugged at the ropes which held it to the earth. There were eight of these, badly arranged, and there was no net work over the canvass bulge. The Professor was here, there, and everywhere, attending to and guiding all details of the management, while all the people were looking with wonder and admiration. At half-past three in the afternoon he stepped into the car, leaning over to shake hands with some of the people who were near by. Again he examined all the apparatus within his reach, and five minutes later gave the word to let go the fastenings, and the balloon shot up bravely. The spectators applauded, and waved handkerchiefs and caps, and the Professor answered the salute, waving his hat in return. Hardly, however, had the swelling paper globe ascended the distance of a hundred feet from the position which it first held, when the spectators saw by its action and the agitation of the aeronaut that something serious was the matter. It did not rise symmetrically, but bunglingly, and there seemed to be some breakage in the substance of which the bag is composed. Yet still it rose, and people at some distance could see that the professor was greatly agitated, rushing about in his car, tugging at the ropes, which he was evidently attempting to arrange. The mouth of the canvass flapped violently. It was a moment of the most intense anxiety, and the crowd stood breathless while the balloon went higher and higher until it attained an altitude of at least half a mile, when it paused for an instant; there was a struggle, and the body slipped from between the ropes that bound it to the car which instantly began to fall, while the balloon, loosened from its burden, bounded up higher. The car upset and the professor fell, at first head foremost, and then turning with legs and arms outstretched, wheeling like lightning towards the earth. Then his body assumed a position directly the reverse of its first, and he struck the ground feet first. His struggles in the air when the car began to fall were fearful to see. He tried to clamber into the basket, and then, seeing that this was futile, tried to use the car as a parachute by turning it upside down. But he finally let go, and, as has been said, struck the ground with his feet, and was

mashed to a pulp of gory flesh. Blood spurted from his mouth and ears, and in falling he made a hole in the earth five or six inches deep. The dreadful accident put a stop to the celebrations of the day. The corpse was placed in the square, where it was viewed by thousands, and is to be sent to his home in Brooklyn, Mich., to-day.

Professor La Mountain, although well known for his balloon ascensions previous to this event, first came prominently into public notice in a famous ascent at St. Louis on July 1, 1859, in company with Professor John Wise and two others, upon a journey to the town of Henderson, Jefferson County, in this State, a distance of 1,150 miles. The object of the aerial voyage was to verify Professor Wise's theory that an upper easterly current of wind existed whereby a balloon could be impelled upon a long journey from east to west. The trip was made in nineteen hours fifty minutes, or nearly a mile a minute. Upon the 22nd of September, 1859, La Mountain and Mr. John A. Haddock ascended from Watertown, N.Y., and in four hours time made a distance of 300 miles, chiefly after nightfall landing at a point in the great Canadian wilderness 150 miles north of Ottawa City and almost to the due north of Watertown. Professor La Mountain further distinguished himself during the war by his balloon ascents in connection with the Union armies operating in Virginia against the Confederate forces. On August 10, 1861, he ascended in a balloon from the deck of the tugboat *Adriatic*, anchored in Newport News, and successfully observed the position of the Confederate forces beyond that place and Sewell's Point. On this occasion he attained a height of 2,000 feet. Still more remarkable was the ascent that he made on October 4 ensuing. He ascended from the camp of the Union army then lying upon the Potomac, upon a reconnoitering expedition. His balloon was attached to the ground by a cord, but after having been up for some time he severed this cord, and so rose to the height of one mile and a half. The wind then carried him over the Confederate lines, which enabled him to take still better observations. Lightening his balloon, he rose to the extraordinary altitude of three miles, passed over Washington at this elevation, and finally descended to the earth in the State of Maryland.

The *London Times*, June 30, says the yacht *Diana*, which recently left Dundee on a Polar expedition, is reported by the whaler *Eclipse*, which has just arrived at Peterhead. The letters which have been received announce that the party were on the 1st of June last, latitude 77 deg. 40 min., being among the floating in ice, which reached northward to Spitzbergen at that time. All connected with the expedition were well, and, notwithstanding that very severe weather had prevailed since it left Scotland, no accident had happened. The arrangements had been slightly interfered with in consequence of the tempestuous weather, and the island of Jan Mayen had not been reached. The *Diana* was to proceed along the outside of the ice towards the north-west corner of Spitzbergen, where she would meet a store-ship which preceded her.

The Shah is making a purchase from Krupp's cannon foundry at Essen which will probably comprise ten batteries of six pounders and five of four pounders, in all sixty guns.