

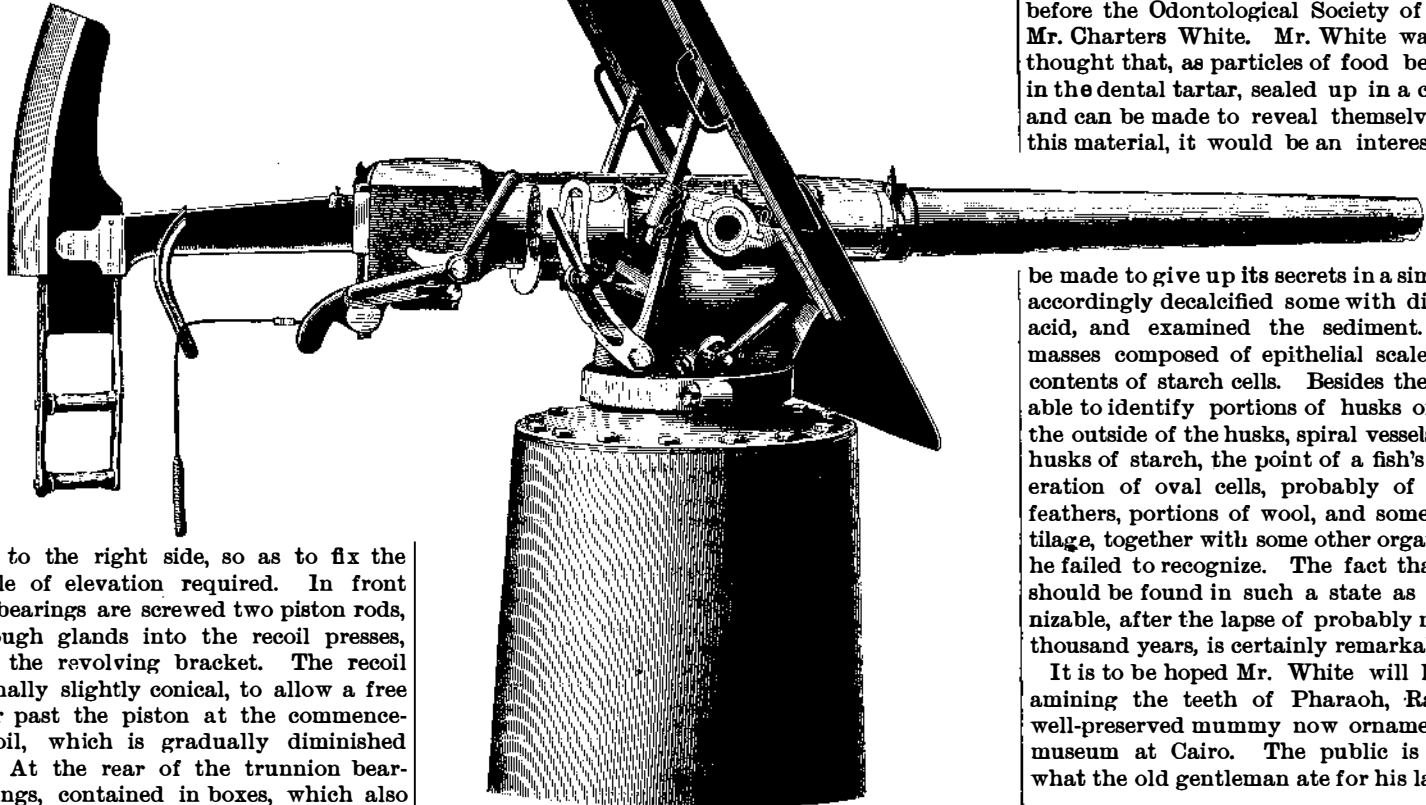
IMPROVED HOTCHKISS AND MOUNTAIN GUNS.

We publish some illustrations of the very fine collection of ordnance shown by Sir W. G. Armstrong, Mitchell & Co. at the Newcastle exhibition, these illustrations showing their present type of Hotchkiss gun and a 7 pounder mountain gun.

Considerable improvements have been effected at Elswick in the mountings of the smaller rapid fire guns. The Elswick automatic recoil mounting for the 3 pounder Hotchkiss rapid fire gun has been, in fact, the germ from which the 30 pounder and 70 pounder mountings have arisen.

The gun itself is placed on a rocking slide, which pivots on trunnion bearings, the gun only moving backward and forward on the slide. The elevation and depression are given by rotating the slide round its trunnions by means of a shoulder piece attached to it. A clamping arc is fitted to the right side, so as to fix the gun at any angle of elevation required. In front of the trunnion bearings are screwed two piston rods, which pass through glands into the recoil presses, forming part of the revolving bracket. The recoil presses are internally slightly conical, to allow a free passage of water past the piston at the commencement of the recoil, which is gradually diminished toward its end. At the rear of the trunnion bearings are two springs, contained in boxes, which also form part of the rocking slide. These being compressed during recoil, serve to return the gun immediately to the firing position.

The rocking slide is provided with trunnions, which fit into a revolving bracket on which the gun is trained horizontally by means of the shoulder piece. This revolving bracket is carried on a pivot plate, to which it is attached by a clip ring in halves. A clamp fixes the bracket in any position. A gun metal pivot at the center of the mounting takes the weight off the mounting and reduces the friction when training. This bracket carries a thin steel shield for protection against rifle fire. Since the gun always recoils in the line of fire, the strains of recoil never vary. From the



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ing, so that it is seen how much the mounting is relieved by the adoption of a certain though small recoil. A guard is fitted over the trigger in the pistol grip to prevent the use of the trigger for firing. A lanyard is attached to it, and led through the brass guard in rear, so that the man at the shoulder piece

can fire by pulling the lanyard. A knot is made in the lanyard, so that the gun cannot be fired if it does not return into the firing position. A rate of fire of about 20 rounds a minute has been obtained with the 3 pounder gun thus mounted. Hotchkiss guns have been manufactured by Sir W. G. Armstrong, Mitchell & Co. in large numbers, especially for the British government. They are used extensively on board ship and in torpedo boats. The 7 pounder mountain gun is intended for mountain service, for which purpose it is made in two parts,

tended for a boat gun. The principal dimensions of the mountain gun are: Length (total), 70½ inches; length of bore, 66½ inches; length of rifling, 55½ inches; caliber, 2½ inches; weight, 400 pounds; weight of shell (filled), 7 pounds 6 ounces; weight of powder charge, 1½ pounds.

Excellent service has been rendered by this weapon in India, Afghanistan, and Egypt.—*Engineering.*

Prehistoric Food.

Some curious evidences of the diet of our prehistoric ancestors of the "stone age" were recently brought before the Odontological Society of Great Britain by Mr. Charters White. Mr. White was struck with the thought that, as particles of food become imprisoned in the dental tartar, sealed up in a calcareous cement, and can be made to reveal themselves on solution of this material, it would be an interesting revelation if

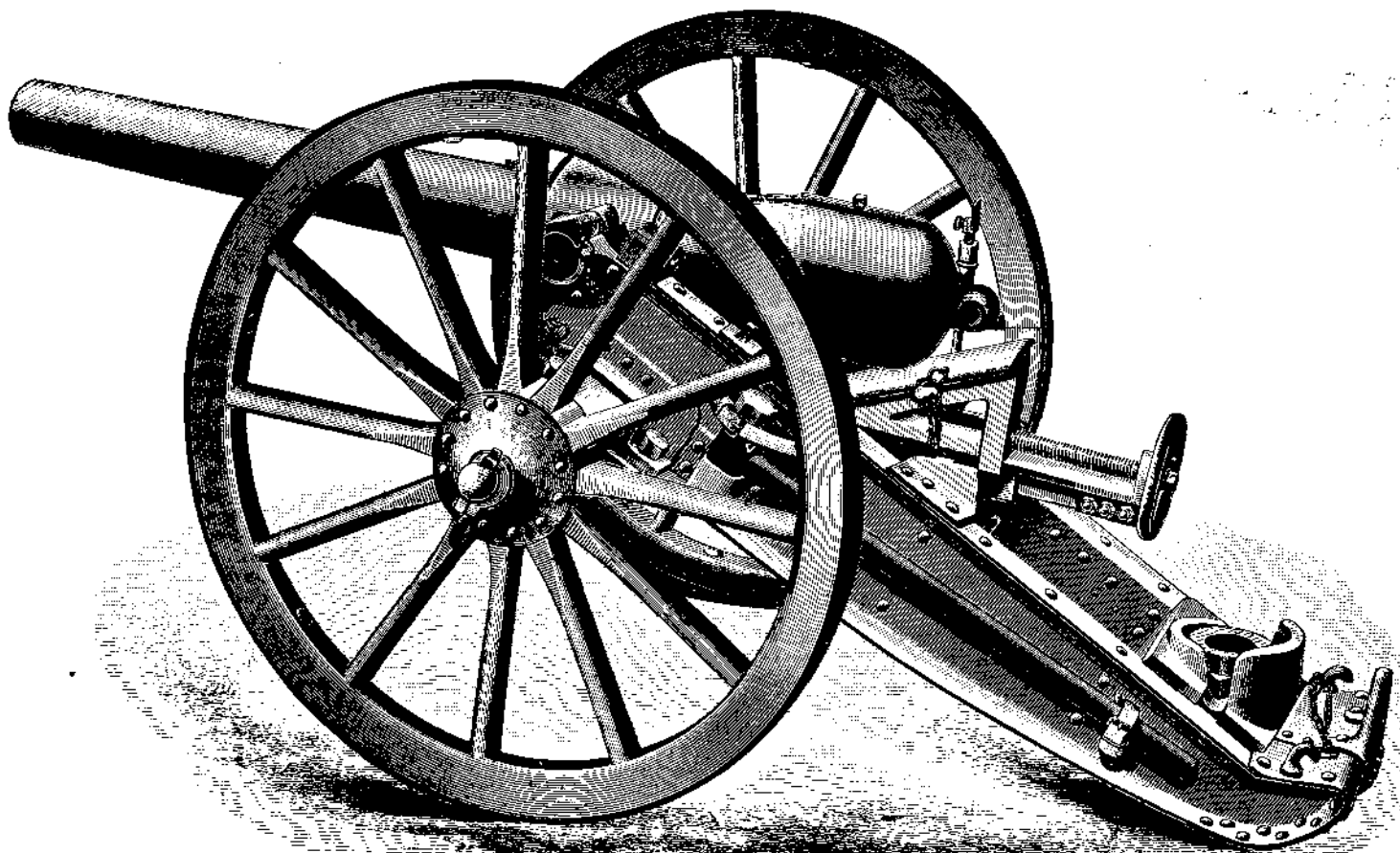
the tartar found on these teeth of the stone age could

be made to give up its secrets in a similar manner. He accordingly decalcified some with dilute hydrochloric acid, and examined the sediment. It consisted of masses composed of epithelial scales mixed with the contents of starch cells. Besides these, Mr. White was able to identify portions of husks of corn, hairs from the outside of the husks, spiral vessels from vegetables, husks of starch, the point of a fish's tooth, a conglomeration of oval cells, probably of fruit, barblets of feathers, portions of wool, and some fragments of cartilage, together with some other organic remains which he failed to recognize. The fact that vegetable tissue should be found in such a state as to be easily recognizable, after the lapse of probably not less than three thousand years, is certainly remarkable.

It is to be hoped Mr. White will lose no time in examining the teeth of Pharaoh, Rameses II., whose well-preserved mummy now ornaments the Egyptian museum at Cairo. The public is curious to know what the old gentleman ate for his last breakfast.

Cotton Mills at the South.

In Georgia, at Columbus, the Swift Cotton Mills Company has added 8,000 spindles to its mill; the Muscogee, of the same place, a new mill of four hundred looms; the King Company, seven hundred looms and three thousand spindles; and at Augusta, Clarksville, Americas, West Point, Dalton, and Savannah, large improvements are making and new mills building. In South Carolina, the Pacelot Company, with 12,000 spindles, is building another mill of equal size, and the Pelzer Company, with 22,000 spindles, is building another large mill. At Marion, a \$100,000 mill is in course of construction, one of \$500,000 at Greenville, one at Clif-



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pressures indicated in the recoil presses during experiment, the maximum strain was found to be 6.7 tons and the mean strain 4.75 tons, the total amount of recoil being 4 inches. Assuming the powder pressure to be 15 tons per square inch, a strain of 40 tons per square inch would be given off on the stand at the center of the gun in the case of the non-recoil mount-

so that it can be easily transported on the back of mules. Its carriage and ammunition are carried in the same way. The total weight of the gun is 400 pounds; each part, therefore, weighs 200 pounds, and forms a load for one mule. Four other mules carry the carriages, ammunition, and gear.

Another 7 pounder shown at the exhibition is in-

ton of \$300,000, one at Bennettsville of \$200,000, one at Columbia of \$250,000, and one at Fort Mill of \$160,000, while others are projected. A cotton oil mill, at Little Rock, Ark., which cost \$200,000, is crushing two hundred tons of seed daily. A \$1,000,000 cotton mill is going up at Galveston, and a \$500,000 cotton mill at Dallas.—*L. A., in Wade's Fibre.*