SMOKELESS POWDER AND ITS INFLUENCE ON GUN CONSTRUCTION

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BY

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ETC., ETC.

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1890.

PREFACE.

In the last chapter of my recent treatise on 'Internal Ballistics' I alluded to the new powders which were then attracting the attention of artillerists.

Referring to their probable nature, I observed that the introduction of any ingredients which would either increase the volume of gas or its temperature, or both together, would not only explain the apparently anomalous action of these new powders, but probably result in the discovery of a still more powerful agent.

Since then this has apparently been accomplished, and the old charcoal powder appears to be doomed to yield to this more powerful rival.

But the adoption of this rival, whose properties are as yet only imperfectly known, is not to be viewed without anxiety. Can it be used with advantage, and above all with safety, in our new type forged steel guns? If not, what changes will its use involve in gun construction? What will be its effect as regards erosion? How will it be affected by storage and change of climate?

These are important questions, to which I do not pretend to give complete answers, but I hope that the following remarks will be of some use in directing attention to the problems upon the solution of which future gun construction and ballistic practice largely depend.

J. A. Longridge.

Greve d'Azette, Jersey.
August 1890.

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INTRODUCTORY.

1. In few paths of science has the march of progress in the latter part of the nineteenth century been more remarkable than in the development of material for warfare.

2. Less than half a century ago, the heaviest guns in our service were the old 68-pounders, weighing about five tons, and firing, with a charge of 20 lbs. of powder, a spherical 68 lb. projectile to which it gave a velocity of about 1500 feet per second—a ballistic effect equal to an energy of 1060 foot-tons.

3. The heaviest service gun of the present day is the 110-ton gun, firing a projectile of 1800 lbs., with a charge of 850 lbs. of powder, and a velocity of 2100 feet per second, equivalent to an energy of 55,000 foot-tons.

4. In the absence, in this country, of the definite knowledge of the action and properties of powder (acquired through the researches of M. Sarrau, in France), the adaptation of the powder to the gun, and, *vice versâ*, of the gun to the powder, has been a problem, the solution of which, so far as it has been solved, is of an empirical nature, so that the progress made in gun construction and powder manufacture has been of a somewhat erratic description.

5. After the day of pebble powder came that of P_2 or C and C_2, then that of prismatic, succeeded by that of brown cocoa, and finally that of the so-called E.X.E., which