

this comparison :—

Accident Group.	1899.	1900.	Remarks.
Total accidents ... ..	191	282	
Total accidents omitting those reported under the new system.	191	252	About 30 accidents have been reported by H.M. Inspectors of Mines, which would not otherwise have come under our notice.
Total accidents in manufacture ... ..	64	88	
Total accidents in manufacture causing casualties.	31	39	
Total accidents in manufacture not causing casualties.	33	49	
Total accidents in keeping ... ..	10	10	
Total accidents in use and miscellaneous	127	191	
Total accidents in use and miscellaneous, omitting those reported under the new system.	127	161	See note above.
Total mining accidents, omitting those reported under new system.	84	104	See note above.
Total miscellaneous accidents ... ..	43	57	

A glance at this table at once reveals the fact that the increase has occurred in Manufacture, Use, and Miscellaneous ; and that the proportion of increase differs but little in the various groups.

It is a remarkable fact also that a considerable increase in accidents, wholly unconnected with explosives, has also been recorded by the Factory and Mine Departments.

Whatever the cause, therefore, it must be one which has operated throughout the whole country, and not one specially affecting the industries connected with explosives. It has been suggested that the most probable cause is the war in South Africa. At first sight this appears to be a somewhat remote explanation, but when it is remembered that from nearly every trade men have been taken for the Reserve, and their posts have been filled by less experienced persons, and when the fact is taken into account that a campaign of such magnitude, details of which are followed by persons of every class, must necessarily breed a certain recklessness of life and limb, the explanation which has been suggested assumes a considerable degree of probability.

#### GOVERNMENT ACCIDENTS.

Jersey  
Arsenal.

In January a very extensive fire occurred in the Town Militia Arsenal in Jersey, by which, amongst other stores, a large quantity of ammunition was destroyed.

H.M.S.  
"Jumna."

On 16th February an explosion occurred on H.M.S. "Jumna," lying in the Medway, and now used as a magazine. The accident was due to the explosion of a 6-pounder Q.F. cartridge which, with 11 others, was contained in a case returned from one of H.M. ships for examination. The case was being handled at the time, and there is little doubt that the explosion was caused by a defective fuze of an obsolete pattern. The other cartridges in the case were not exploded.

Waltham  
Abbey.

At the Government factory at Waltham Abbey, on the 1st March, 1900, an explosion took place in No. 1 Hydraulic Press during the pressing of four primers "B," 9 oz. The full pressure had been on for about  $1\frac{1}{4}$  minutes, or half the usual time, and the percentage of moisture in the guncotton would be then about 20.

Two men were at work in the house, one at No. 1 press, the other at No. 2. Both men were behind the rope mantlets. The man working No. 1 press was thrown backwards against the wall, and suffered from shock ; the other man felt no ill effects.

The crosshead, bush-block, ramhead, and left back column were broken, and minor damage done to the press generally. Only the one primer was involved, the other three were taken out subsequently intact.

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1899/1900

No structural damage was done to the building, but out of 98 panes of window glass 37 were smashed.

Early in the morning of the 4th July 5,275 pounds of gunpowder was exploded in an expense cartridge store of one of the forts of the Severn defences at Brean Down, by which one gunner was killed. Considerable damage was done to the adjacent buildings and fittings, but in no case did the area over which structural damage occurred extend beyond the distance laid down to be observed by our "Table of Distances." It was impossible to determine the precise circumstances under which the explosion occurred beyond the fact that it was undoubtedly caused by the action of the deceased gunner in firing his carbine into the magazine. The coroner's jury found that he committed this malicious act "whilst in a state of temporary insanity."

On the 8th July the tug "John Bull" was lying off Dungeness. Some of the crew went ashore and returned with a large shell which they had found on the beach. They were cleaning it up for a trophy when it exploded, blowing one man to pieces and injuring three others, of whom one subsequently died from his wounds. The shell had probably been fired at Lydd, and had apparently been in the water for some time.

A supervisor and two workmen employed under the Scottish Office were employed in blasting. They had charged a hole with blasting powder and were tamping it, using a rammer with iron in its construction, and were probably also hammering it. They were in a hurry to save a tide. The explosion killed the supervisor, and injured the two workmen, one very severely.

A party of Gordon Highlanders at Koomati Poort were detailed to destroy a quantity of Boer shells with guncotton. In opening a case of detonators it exploded, killing two and injuring many others.

A serious gunpowder accident occurred at Tung Chow on the 14th September, whereby Captain Hill and 14 men lost their lives and 19 men were injured. The victims formed portions of a fatigue party engaged in spreading powder out on the ground with a view to destroying it, when from some cause it was ignited, probably by the careless handling and hammering of the powder cases.

## FOREIGN EXPLOSIONS.

### *Africa.*

On the 20th January Begbie's Engineering Works at Johannesburg were blown up, and many lives are said to have been lost, and considerable damage was done to neighbouring buildings. The factory had been commandeered by the Boer Government for the manufacture of shells. Mr. Begbie and another man were arrested and brought up before the Criminal Court and charged with murder.

### *America.*



## GOVERNMENT ACCIDENTS.

Waltham  
Abbey.

The investigation into an accident in a cordite mixing house, Waltham Abbey, which occurred on the 14th February, contained several points of interest. The accident was, fortunately, unattended by injury to the workpeople.

The mixing machine in question was standing idle, but the charge had just been introduced, and two men were engaged in cleaning the blades and sides. One of them was using a phosphor bronze knife in his right hand, while the other hand was resting on the machine, when a spark was seen to come from the knife quickly, followed first by a puff and then by the flaring up of the material in the machine; the men had plenty of time to escape and were uninjured.

Although the natural explanation would be that it was a case of friction between the metal knife and some hard gritty material, yet the possibility of electricity being the cause could not altogether be lost sight of, and Major Nathan, the Superintendent of the Royal Gunpowder Factory, to whose courtesy we owe the information here given, in conjunction with Major Holden of the Royal Gun Factories, who visited Waltham Abbey the next day, carried out various interesting experiments in this connection, with the following results.

No discharge could be obtained from the machine so long as the experimenter did not approach too near the belts. If, however, a position were taken up close to the belts, the person so standing became electrified (the asphalt floor acting as an insulator) so long as he did not touch the machine or other earthed conductor; *i.e.*, when one hand was placed between the belts and the other hand on the machine the electricity at once went to earth, but if an insulated position were maintained a spark could, after a short time, be obtained by approaching the hand to the machine or other metal surface. Major Holden suggested that the belts should be protected by means of a well earthed wire casing, and this was subsequently tried and found to completely meet the case,—a result also obtained by the use on the belts of a composition known as "Beltine."

From experiments in the laboratory Major Nathan found that a mixture of air and acetone vapour in certain proportions can be readily exploded by means of a spark from an induction coil.

From the above it is evident that even though electricity was not the probable cause of the present accident, it is doubtless a distinct source of danger.

Okehampton.

On the 19th August, an accident occurred on the Artillery Range at Okehampton, by which three men lost their lives. The Range Sergeant had been informed of the discovery of a live shell on the slope Yes Tor, and about four o'clock in the afternoon the Sergeant accompanied by his informant and by a constable of the Devon Constabulary went to the place where the shell was hidden. By some means or other the shell exploded killing the three men. The jury found a verdict of "accidental death" in each case, caused by the bursting of a lyddite shell, and added that in their opinion every reasonable precaution had been taken in the past for the protection of the public during artillery practice on the Moor.

Royal  
Arsenal,  
Woolwich.

On the 25th September, a boy was placing a copper disc in a fuze detonator in one of the danger buildings at Woolwich Arsenal, when, through carelessness, he caused it to explode. An automatic machine for doing this work was in hand at the time, and was going to be installed next day. The boy was seriously injured.

## FOREIGN EXPLOSIONS.

Foreign  
explosions.

Following the practice of former years, we proceed to give a brief account of the more interesting foreign explosions which have come under our notice. As we have remarked in former reports, our information as to these accidents is necessarily very incomplete, and often gleaned only from brief notices in the newspapers.

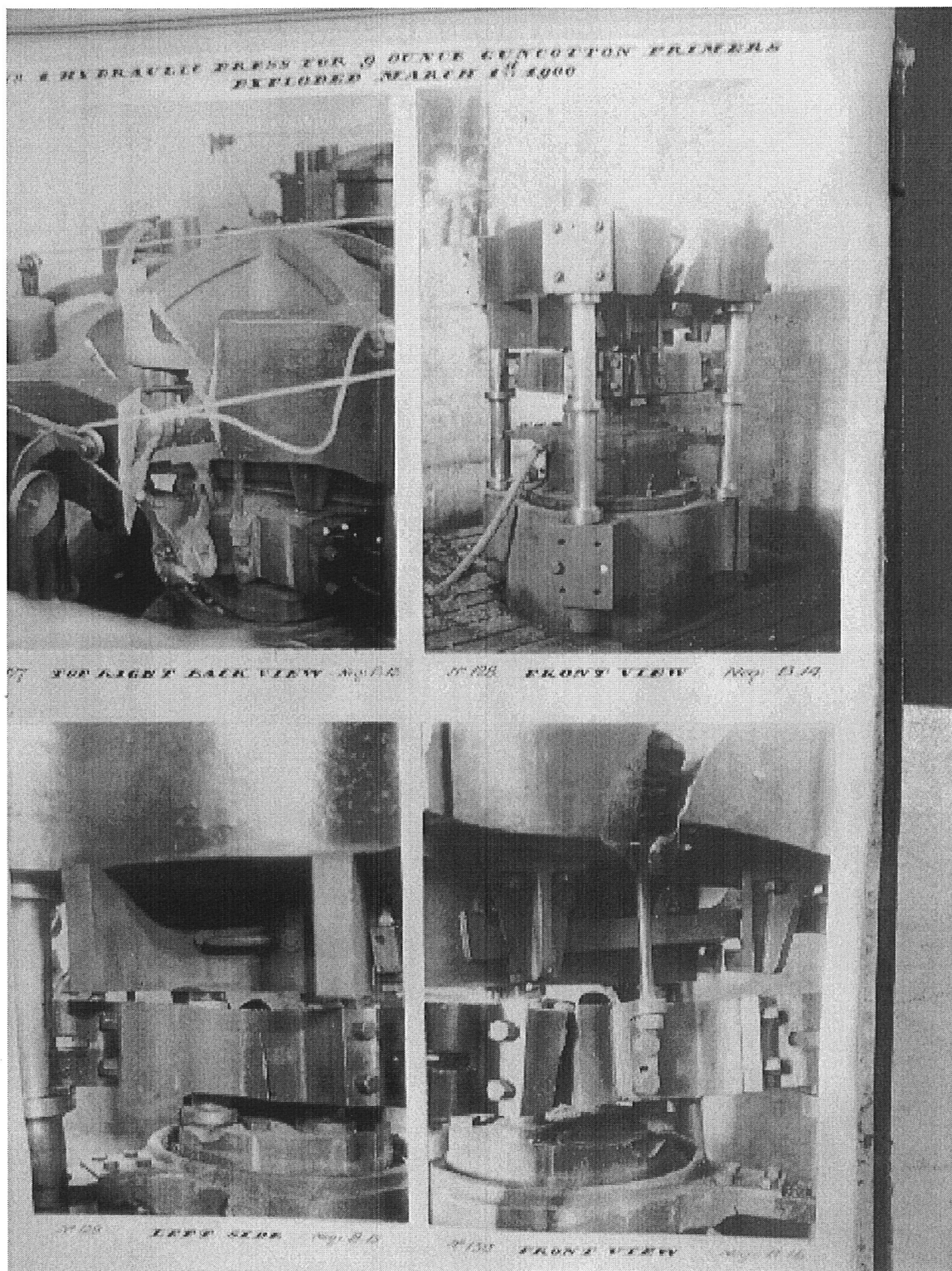
In some instances, however, through the courtesy of persons concerned, through the Foreign Office, or from other sources, we have been able to collect details which are interesting and often valuable.

In the following list the countries are arranged in alphabetical order, and the more trivial explosions have been omitted.



1.3.1900

128/126



HYDRAULIC PRESS FOR 9 OUNCE GUN COTTON PRIMERS  
EXPLODED MARCH 1<sup>st</sup> 1900

TOP RIGHT BACK VIEW

FRONT VIEW

LEFT SIDE

FRONT VIEW

Hydraulic Press Co. Primers exploded 1.3.1900