

# Progress in Science.

## The German Dreadnought Nassau.

**I**N view of the great secrecy which attended the construction of the Nassau, the type ship of the fleet of German Dreadnoughts, some surprise was expressed upon the first public view of the ship, that she possessed, as a Dreadnought, no features of marked novelty. There is something familiar about the arrangement of her main battery, with its armament of heavy guns carried in six turrets, one forward and one aft of the centre line, and four arranged midships quadrilaterally.

Obviously, the principal disadvantage of the system is that the ship, although she mounts twelve heavy guns, can bring only eight of them to bear upon either broadside, at least four guns being masked by the superstructure or by the other turrets while she is fighting a broadside engagement with the enemy.

In justification of their adoption of the quadrilateral system of mounting, the Germans announce their conviction that in the engagements of the future there will be more fighting in the end-on or quartering position than the advocates of the all-centreline system of mounting believe; and they emphasise the fact that the Nassau can not only concentrate six heavy guns in the end-on position, but that she could deliver this heavy fire, should the exigencies of an engagement demand it, both forward and astern at the same time. Furthermore, there is a certain advantage in the fact that two guns and four turrets are held in reserve on the lee side and are greatly protected by the turrets which are in engagement on what might be called the weather fighting side of the ship.

Should the weather guns be disabled, it would be possible for the fleet to make a complete turn of 180 degrees, and bring four big guns, with their gun crews entirely fresh, into the fight.

To these arguments it will be answered that, by moving one of the four mid-ship turrets forward and placing it

at a sufficient height to fire above the foremost turret, and removing another of the turrets aft and giving it a similar relation to the aftermost turret, not only would the broadside fire of the Nassau be increased from 8 to 12 heavy guns, but the end-on fire would be strengthened by the addition of two more guns, raising it from a concentration of six to one of eight guns. This is the method adopted in the new Argentine and British cruisers, the most powerful Dreadnoughts now under construction, which will be able to fire eight guns ahead or eight astern, or twelve on either broadside.

However, in estimating the merits of warship design, we must be careful to bear in mind the question of displacement, which in the Nassau stands at the very moderate figure of 18,500 tons; and, if we remember that the latest Dreadnoughts of other countries have run up to 26,000 tons, it must surely be admitted that the Germans, in view of the limited displacement of the Nassau, have turned out a decidedly creditable ship.

The following dimensions, which have been obtained through the German Navy Department, may be taken as correct:—Length, 452 feet; beam, 89 feet; draft, 26½ feet; displacement, 18,500 tons; normal coal supply, 950 tons. The Nassau is driven by triple engines, and on her trials considerably exceeded her contract speed of 19 knots and may be set down as a 20-knot vessel. The armament consists of twelve 11-inch, twelve 6-inch, and sixteen 3.4-inch guns. She is protected by eleven inches of Krupp armour on the belt, and the barbettes and turrets, and twelve inches on the conning tower.

### How Aeroplanes Affect Animals.

European sportsmen are beginning to fear that game will be made scarce by the multiplication of aeroplanes, balloons

and other aerial vessels. It is well known that where many kites are habitually flown they have the effect of driving the game to other districts. The effect of a kite, however, is very small in comparison with that of an aeroplane or a dirigible balloon. A German landowner, strolling over his estate, saw two black storks which had been standing, with a number of ducks, on the bank of a pond, suddenly take to flight, without apparent reason. The next instant the ducks, quacking loudly, took wing and were soon out of sight. Looking around for the cause of the birds' fright the proprietor saw a dirigible balloon, which the birds had probably perceived before it became visible to him. He learned afterward that deer, browsing in the fields, had been frightened by the sight of the airship or by the noise made by its propellers, and had fled to the forest. All animals are terrified by airships. Partridges, quail and other game birds crouch and hide, while domestic fowls utter loud warning notes the instant they perceive the monstrous bird of prey. The Swedish aeronaut Von Hoffken, while sailing at a moderate elevation, observed that elks, foxes, hares and other wild animals fled at his approach, and that the dogs ran, howling, into the houses. While the Zeppelin III. was going from Düsseldorf to Essen the aeronauts on board noted that horses and cattle galloped frantically over the fields on catching sight of the airship.

### Duplicating the Siberian Railway.

Vast improvements are being made in the Trans-Siberian Railway which, in addition to being double-tracked, is being largely relocated with a view to the elimination of grades and the shortening of distance. When the work has been completed, the distance from Paris to Peking will be 6,300 miles instead of 7,500 miles over the present line via Harbin and Mukden, and the fourteen days now consumed on the trip will be reduced to nine and a half days. The value of these improvements will be as great from the military point of view as they will from that of passenger and freight traffic.

### Wonderful Gunnery.

A possible revolution in gunnery—naval and military—is foreshadowed by the experiments which Messrs. Armstrong Whitworth and Co. have been carrying out on their experimental range at Silloth, Cumberland, with a gun which is shortly to be delivered to the War Office.

The greatest secrecy has been observed, but it is understood the leading feature of the new weapon is the replacement of recoil springs by chambers containing a patent liquid and air. These new recoil cylinders are understood to have been such a success that it has been demonstrated possible for the gun, once laid, to remain in the same position for ten consecutive shots.

The gun experimented with is a 14.318. breech-loader, but there appears to be no reason to prevent the mechanism being fixed to other types of guns, notably the weapon employed on our Dreadnoughts.

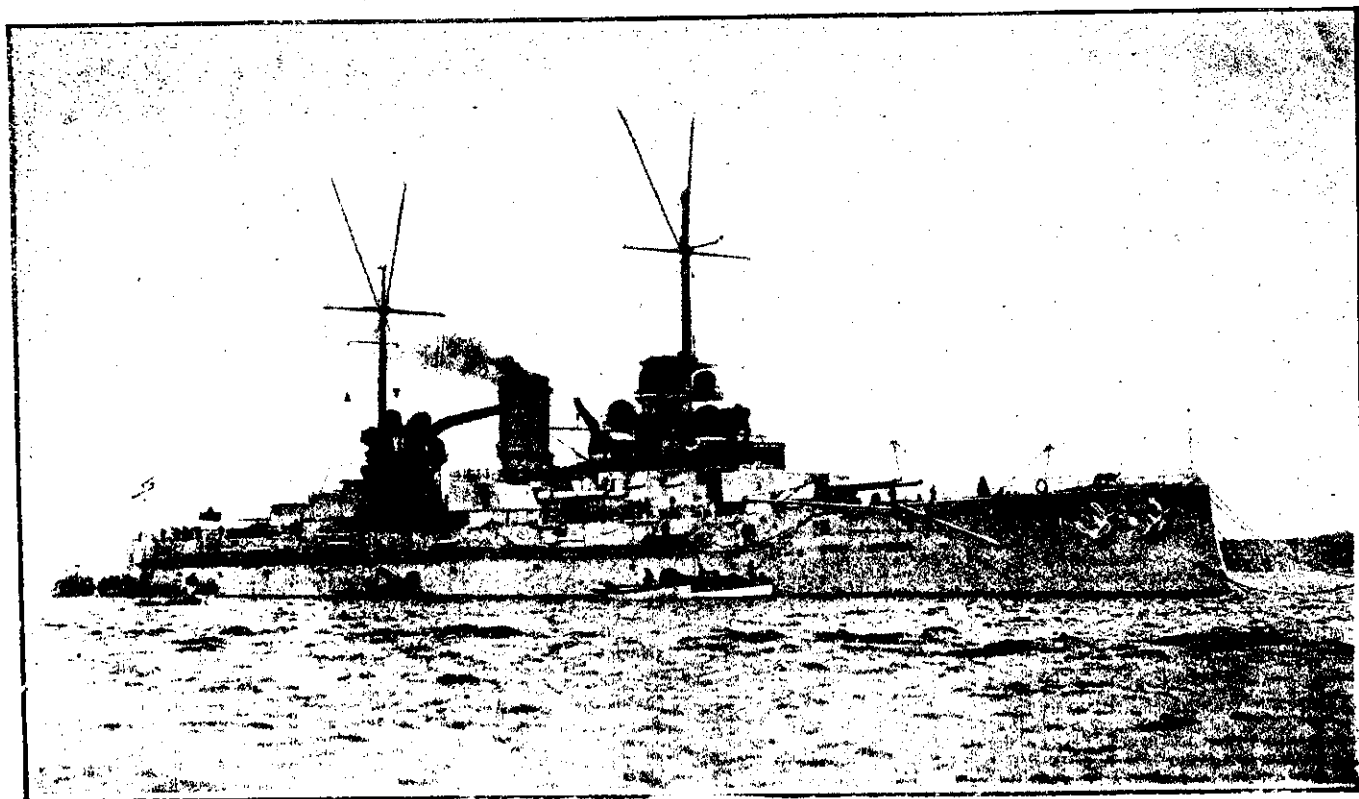
The increase in steadiness and accuracy of shooting is remarkable, as is shown by the statement that of ten shots fired, as stated above, five passed practically through one point, a feat hitherto unknown in the annals of gunnery.

### A Simple Device.

An experiment which is being tried on the Hudson and Manhattan railroad tunnel system beneath the Hudson River will be watched with much interest by both the railroads and the public. It consists of an illuminated station sign, placed inside the cars, which are so arranged that the guard, by pressing a button when the train starts, rings a bell and causes the sign to display the name of the next station. This sign continues to be displayed until the train leaves the station designated. A simple device, this, whose utility is so obvious, that it should have been in use from the very commencement of electrically-operated rapid transit.

### Amateur "Wireless" Operators.

The fourteen-year-old president of the Junior Wireless Club of America appeared before the Senate Committee on Commerce recently to protest against the bill introduced by Senator Depew for regulating wireless telegraphy. The young president gave a very forcible argument in favour of amateur wireless telegraph operators, pointing out the fact that if the bill were passed it would check the inventive genius of some forty thousand experimenters. He also called attention to the fact that it would be impossible to enforce the bill without a veritable army of expert wireless telegraph engineers. The junior wireless telegraphers claim that it is possible to cut out interference if the proper apparatus is used, and that the present attack on amateur wireless telegraphers is unwarranted.



NASSAU—FIRST OF THE GERMAN DREADNOUGHTS.