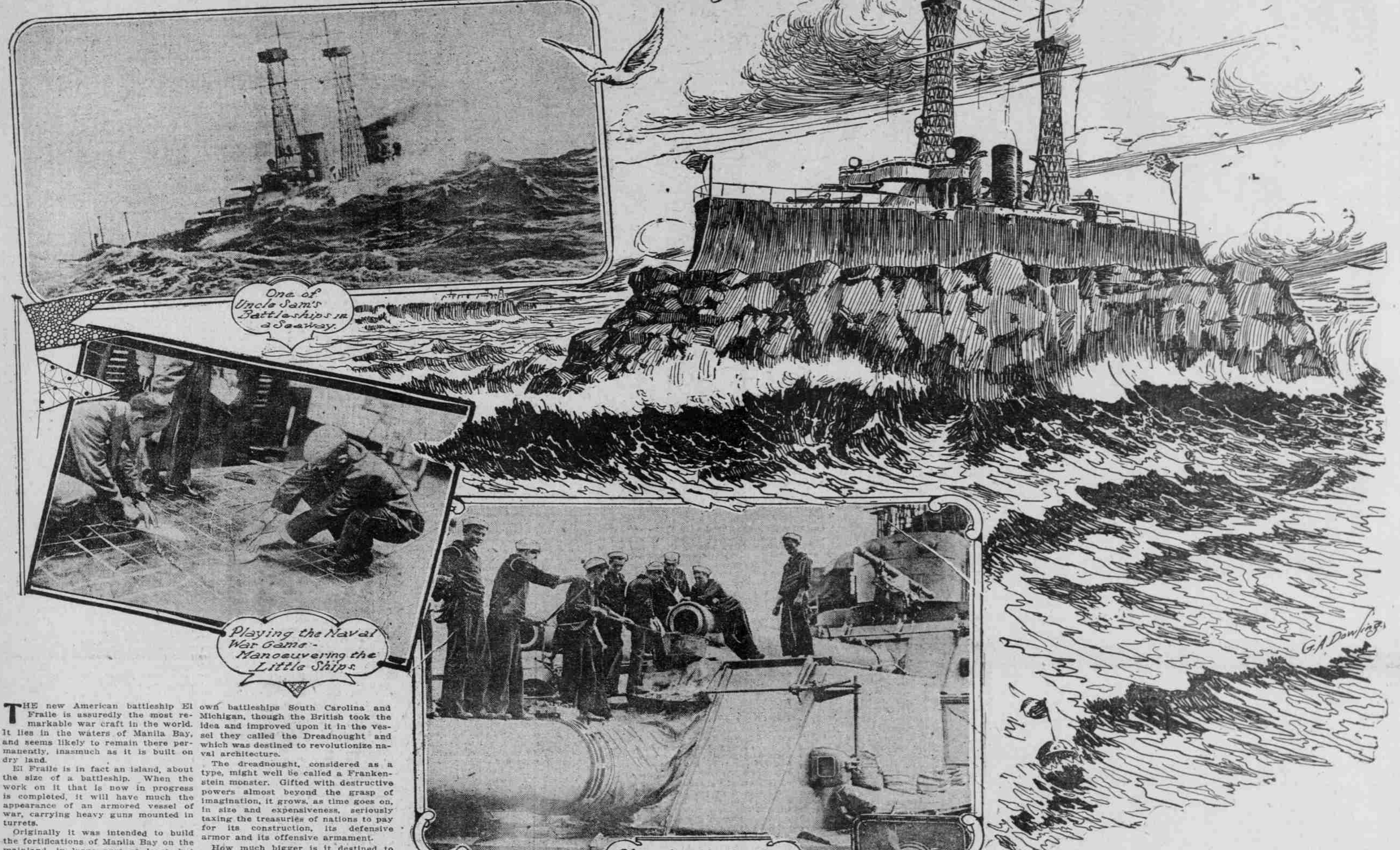


# Giant Battleship, Built On Land, Can Never Float

Other Superdreadnaughts to Be  
Built by United States Again Raise  
Question of Size Limit for  
Sea Fighters.



One of  
Uncle Sam's  
Battleships in  
a Seaway.

Playing the Naval  
War Game -  
Manoeuvring the  
Little Ships.

Cleaning the Big Guns  
on a Battleship.

**T**HE new American battleship El Frate is assuredly the most remarkable war craft in the world. It lies in the waters of Manila Bay, and seems likely to remain there permanently, inasmuch as it is built on dry land.

El Frate is in fact an island, about the size of a battleship. When the work on it that is now in progress is completed, it will have much the appearance of an armored vessel of war, carrying heavy guns mounted in turrets.

Originally it was intended to build the fortifications of Manila Bay on the mainland, in large part at least, but it was finally decided that a better plan would be to establish them on islands, because thus they would be safe against land attacks. Fort Arthur was a very formidable congeries of forts, but the Japanese, when they found out that assault from the sea was hopeless, were able to capture it by landing an army.

On the other hand, Fort Sumter, in our own Civil War, situated as it was on an island of less than 20 acres, held out for two years against bombardment by a fleet, though exposed to attack by shore batteries and garrisoned by only about 300 men.

Appreciating this military advantage, the Japanese within the last few years have built several artificial islands for the defense of their seaports. Recently our own War Department had in contemplation the construction of such an island, with suitable fortifications, to guard the mouth of the Chesapeake.

As matters now stand, in the absence of this or other defenses, an enemy, having once secured command of the sea, could establish a base in Lynnhaven Bay, without coming under the fire of a single gun. He could pass in or out of Chesapeake Bay at will; could have access to vast quantities of valuable supplies of all kinds, and could paralyze the great trunk railroads crossing the head of the bay.

Within the last few weeks Congress has appropriated money for building two new superdreadnaughts which will cost \$15,000,000 apiece. Each of them will be of 32,300 tons displacement, and 300 feet long on the water-line. It remains to be determined whether they will be run by electricity, like the superdreadnaught California, now building at the Brooklyn Navy-Yard, which is the first and only electric battleship in the world. It will be propelled by four screws and will have two sets of generators, one for each pair of screws, so that if one set fails through any cause the vessel may not be disabled.

A modern ship of war is provided with a powerful electric plant, by which nearly all of its internal machinery is operated, including that which moves the turrets and points the guns. The same installation illuminates the vessel, furnishes means for telegraphic and other signaling, and even peels the potatoes for dinner in a specially-contrived and ingenious machine. But up to the present time no attempt has been made to propel a warship by electricity.

One should realize that the principal contrivances new in warfare, and now in use for purposes of destruction by foreign navies and armies, are American inventions, including the submarine torpedo, the submarine mine, the submarine boat, the flying machine, and even the fort-destroying German gun. The first dreadnaughts were our

own battleships South Carolina and Michigan, though the British took the idea and improved upon it in the vessel they called the Dreadnaught and which was destined to revolutionize naval architecture.

The dreadnaught, considered as a type, might well be called a Frankenstein monster. Gifted with destructive powers almost beyond the grasp of imagination, it grows, as time goes on, in size and expensiveness, seriously taxing the treasuries of nations to pay for its construction, its defensive armor and its offensive armament.

How much bigger is it destined to grow? This is a question which nobody, not even the naval architects themselves, can answer. Apparently its development in respect of size and armament has not yet come to an end. It will go on growing and, in all likelihood, will carry more and bigger guns.

There are, however, certain limiting factors. One of these is the size of the locks of the Panama Canal. Warships of all the nations have to be able to go through the canal, and, in order to do so, they must be less than 1000 feet long, less than 110 feet broad, and must draw not more than 40 feet of water.

Another limitation of size is set by difficulty of maneuvering. Naval tactics demand quick movements, and the bigger the ship the greater the minimum diameter of the circle in which she can turn.

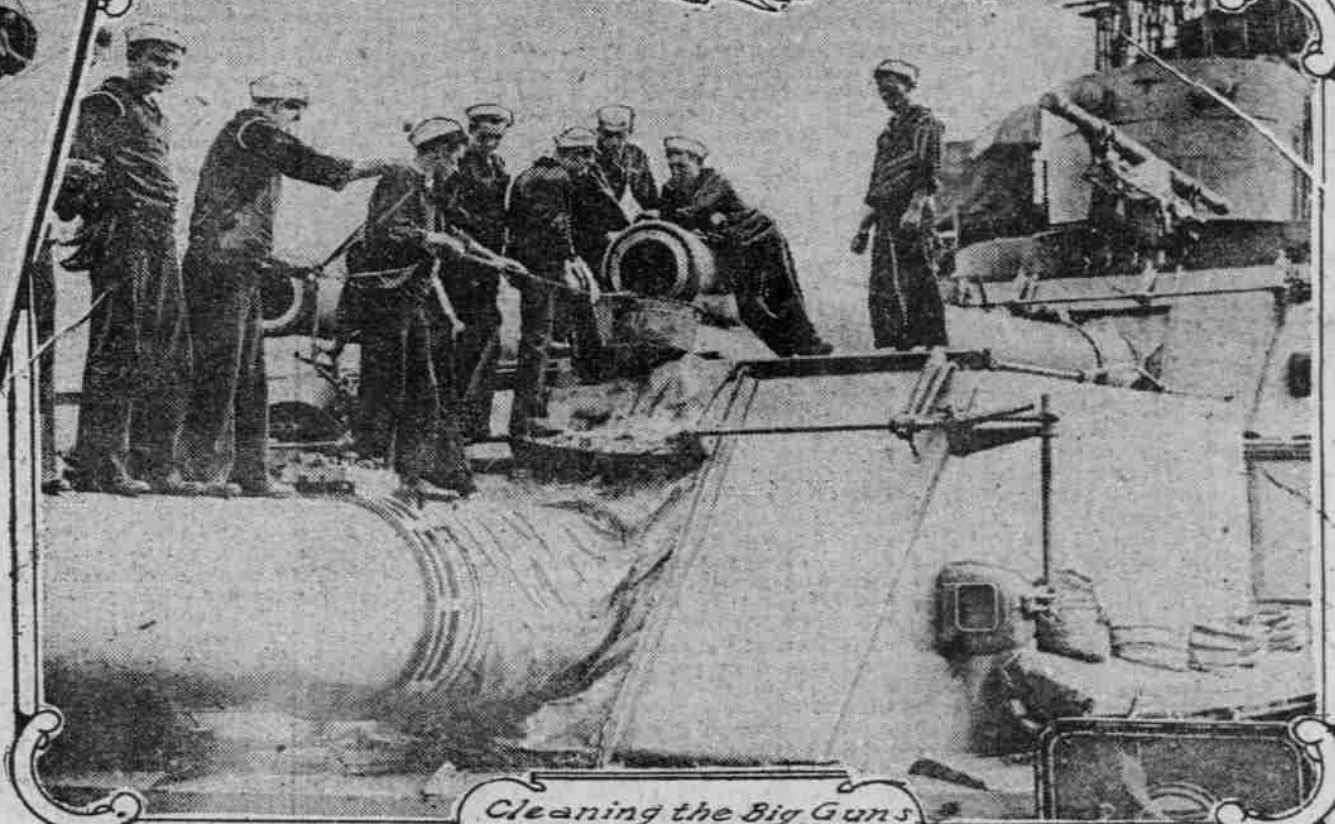
Furthermore, the maximum draught of battleships must have relation to the depth of harbors. Their size must not be so great that they cannot find docks big enough to hold them while undergoing repairs or the scraping of their bottoms—which latter has to be done at least once a year if they are not to lose speed.

The present limit of length is slightly over 800 feet—this being the size of our newest dreadnaughts. Ocean passenger steamships run up to 900 feet, but they are much less broad relatively. A battleship has to have breadth of beam in order to serve as a good gun platform.

Apparently there is no room on the newest dreadnaughts for any more great rifles; if they are to be more of these giant guns, the ships must be made bigger. One thing that has to be taken into consideration is that such huge weapons being concentrated leads upon the vessel's structure. In a way she is subjected to "hogging" and "sagging" strains which severely test her strength, and loads that are not distributed have a tendency to augment such stresses.

The old rivalry between the armor and the gun has decided itself in favor of the latter. No armor can be made thick enough or strong enough to resist at short range the projectile discharged by a 14-inch rifled gun. Nevertheless, at long range the armor proves a fairly satisfactory protection, of the General speaking, the idea of the naval architect is to make the armor about equal in thickness to the caliber of the big guns which the ship will carry. Thus, if the guns are to be of 14-inch caliber, the armor might be 14 inches thick over the vitals of the vessel, thinning somewhat toward her ends.

One thing to be considered is that the ship must have a reserve of buoyancy. In battle she is liable to be dam-



The Captain of a Dreadnaught is Commander of a Battalion of (Bluejacket) Infantry for Shore Duty.



Naval War Game - Receiving Orders From Empire for the Next Move.

aged; a few shells go through her hull and she sinks a little. But, possessing a reserve of buoyancy, she is able to stay afloat. If this reserve is exhausted, she either goes down like an iron kettle with a hole in it or "turns turtle," depending on the character of the injuries sustained. After all, the first essential in a sea fight is to keep on top of the water. So long as a battleship can do that she is to be reckoned with seriously by the adversary.

As for the rivalry between attack and defense on the sea, it is a puzzle to imagine what floating object, no matter how heavily armored, could stand up against projectiles fired from 14-inch guns at a distance, say, of three miles. Such a conical shell, 4 1/2 feet long, is able to pierce at that range 17 inches of solid steel, striking with an energy equal to that of a ton of metal dropped from a height of eight miles. Its weight (1400 pounds) is not far from twice that of a 12-inch shell (870 pounds)—a fact which gives a notion of the superior effectiveness of the larger weapon. Eight of our older dreadnaughts have only 12-inch rifles.

One should realize that the up-to-date method of sea-fighting is to concentrate simultaneously all the guns of a number of ships upon a single vessel until the latter is disabled, and then to turn the combined attack upon another unit of the enemy's force. By such means the most powerful battleship, if assailed at short range—say, three miles—might be destroyed in a few minutes.

Each of our new dreadnaughts will have a secondary battery of 23 five-inch breech-loading, quick-fire rifles. Such a gun throws 12 50-pound shells a minute loaded with high explosives. But, though formidable weapons, they are not meant to be used in battle, being intended merely for defense against torpedo-boats and submarines. Collectively they are called the torpedo defense battery.

Of the \$15,000,000 paid for each of our newest dreadnaughts the cost of armor and guns will represent about one-half. Such a ship carries not far from 1900 men and officers. Of the latter 43 hold commissions, 25 in the wardroom and 18 in the junior mess. The number of "bluejackets" is 767, and of marines 64, without counting 39 petty officers and 12 warrant officers. This makes a total of 255.

For the battleship Pennsylvania, newly built at Newport News, there will be an extra allowance of 14 commissioned officers, making 39 in all, because she is equipped as a flagship, with quarters for an Admiral.

What does it mean? Here is devotion which exceeds that of many mothers of many men. Here is affection manifested in a lower order of life which equals our own. It is probably true that the dog is of all animals the most capable of sincere, self-denying attachment, these higher qualities having been developed by long and close companionship with men. He can subordinate himself more completely and enter into man's feelings more sympathetically than any other form of life; yet how friendly and how loving to the extent of their capacity work all the furred and feathered folk of the woods and fields be if only man would meet them half way. How the birds would delight to sing for him if their confidence had not been destroyed by ages of persecution. There are Hindus who assert as a fact within our experience, that there are kindly men who respect all animal life whom neither tigers nor snakes will harm. An immunity of this sort was assured of old to beavers, but it would seem that nobody has sufficient faith to make trial of it nowadays.—Rochester (N. Y.) Post-Express.

## DEVOTION OF A FAITHFUL DOG

**T**HE dog of a French soldier followed him to the war, lived with him in the trenches and shared his blanket at night. A shell killed a dozen men and buried this one, badly wounded, in a trench which the explosion half filled with earth. The dog dug frantically for his master and managed to expose his face before he suffocated. Then he seized other soldiers by their clothing and finally succeeded in drawing them to the scene. They unrolled their comrade and put him on a hospital train, into which the dog also managed to force his way. At the hospital, near Paris, the man's leg was amputated, and the devotion of the dog was such that the attendants found a kennel for him near the kitchens and allowed him to visit his master twice a day. His love for the wounded man was so great and his sympathy with his suffering so evident as to touch the hearts of all who saw it.

What does it mean? Here is devotion which exceeds that of many mothers of many men. Here is affection manifested in a lower order of life which equals our own. It is probably true that the dog is of all animals the most capable of sincere, self-denying attachment, these higher qualities having been developed by long and close companionship with men. He can subordinate himself more completely and enter into man's feelings more sympathetically than any other form of life; yet how friendly and how loving to the extent of their capacity work all the furred and feathered folk of the woods and fields be if only man would meet them half way. How the birds would delight to sing for him if their confidence had not been destroyed by ages of persecution. There are Hindus who assert as a fact within our experience, that there are kindly men who respect all animal life whom neither tigers nor snakes will harm. An immunity of this sort was assured of old to beavers, but it would seem that nobody has sufficient faith to make trial of it nowadays.—Rochester (N. Y.) Post-Express.

**Her Fair Offer.**  
London Punch.  
Wife (about to purchase military headgear, to her husband—(I know it's more expensive than the others, dear, but—well, you see you're too old to enlist, and I really feel we ought to do something