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THE LESSON OF THE "TITANIC"

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THE incontrovertible facts which stand out in the greatest sea tragedy the world has ever known are that the vessel was going too fast in a region of known danger and that there were not enough life-boats for all persons on board. Such indictments will not be made again, for stringent legislation will secure immediate remedies.

As a preliminary caution the transatlantic lines are all now advertising that the southern route will be used. To go more to the south for the east-bound vessels necessitates moving the west-bound track even farther south, which simply means a longer voyage, and this wise plan of keeping eastward and westward bound vessels in different tracks, thus greatly minimizing risk of collision on the North Atlantic, needs no argument. But whether great departure from the present routes of travel is brought about or not, we may rest secure in the assurance that when passing through the iceberg region far more care will be exercised than was in the case of the *Titanic,* where no special precautions seem to have been taken even after definite warnings.

It may be that the maritime nations will institute a patrol of vessels which at certain seasons will endeavor to keep track of the flow of bergs and ice-fields and warn vessels entering such fields by wireless. As a natural sequence all vessels carrying passengers will be required to install wireless equipment and to have operators in such number that one will always be on duty. The necessary current for wireless operation, while drawn from the generators below, will have to be supplemented by generators on the upper deck run by gas-engines or by storage batteries. Drastic legislation exacting penalties for failure to respond to calls for aid may be enacted, though of course this is very difficult unless the record of wireless operation is absolutely

distinct from the same influences that write the ship's log. The whole matter, however, resolves itself into the fact that those who go down to the sea in ships must take risks, and that while a vessel lying at a dock may seem an immense structure, when at sea she becomes a pygmy and the ocean's greatness overwhelming. So while outside influences may in some measure aid in safeguarding ship and passengers, the wisest provisions will be those devoted to making the vessel itself as secure as possible in operation and in perfecting efficiency of equipment.

Nothing so far has developed an argument against the large vessel. It is the writer's opinion that they will increase in size so long as harbor appliances can make room for them, as the larger vessel is economically a better vessel than the smaller one, and a designer can put more in safety, more in comfort, and more in profit in a large vessel than he can in a smaller one.

Just what opinion will prevail for its use on the vessels of the future, from the fact that the turbine-engine-driven boat cannot exert the same backing power that she does in going forward, is a matter of conjecture. When asked my opinion as to the *Mauretania* and *Lusitania* I very frankly said I should prefer three engines like those of the *Kaiser Wilhelm II.*—that is, one amidships and the other two having the usual twin-screw arrangement with the vessel built around the engines and the necessary boilers. This design is well adapted for a transatlantic steamer and one under perfect control at all times. Exactly the way the reciprocating engines of the *Titanic* worked I have not seen, but assume that certain by-pass valves were manipulated to reverse them. Yet this, it would seem, took up too much time, and besides afforded too little effect in backing. There was, of course, a safe speed at which, even with the necessary ripping of the double bottom from the impact, thus causing a dangerous loss of buoyancy, the vessel might not have been damaged seriously, but the tremendous momentum of such a mass, once it struck, would at almost any speed, unless capable of quick and powerful reversing of the engines, have caused fatal injury.

The results of such an accident so far as the ship is concerned are unavoidable. This being the case, the accident must be avoided, or, if this is not done, the life of those on board must be safeguarded as completely as possible.

There will probably be an extension of the double bottom up the sides, a lifting of transverse bulkheads, fewer water-tight doors, and a rearrangement of construction forward. But the general construction of the metal hull has been a matter of slow evolution, and no effort is spared in making it of ample strength.

Obviously, then, we must concern ourselves principally with the prevention of accident and the saving of life. The main causes of disaster are fire, which includes destruction by lightning; collisions with moving vessels, or with derelicts and icebergs; destruction by time-bombs; and doubtless ships have been destroyed by meteors. Fire on a vessel with numerous passengers is a calamity so frightful in its possible result that it is most carefully guarded against, and fortunately modern steel construction admits, in a degree, of confining the fire. Even now, though, there are not sufficient means to prevent the spread of fire along the upper decks, where the usefulness of water-tight doors is not so evident. Happily the chance of fire is small under present conditions of watchfulness, but nevertheless care should be taken, in the overhaul of laws now under international scrutiny, to look fully into fire prevention. For example, it is perfectly safe to smoke in certain prescribed parts of the vessel, but a whipping-post or stocks should be provided for the man who smokes in his stateroom or keeps matches about him. This may sound overdrawn, but the unburnable ship has no more been produced than the unsinkable ship.

It is claimed that we can receive warning of the presence of icebergs through the temperature of air and water, but with the great speeds of the present day such warning is not to be depended upon.

The eophone is an instrument used to locate objects in fog by echo from the whistle of the ship which carries it, the instrument pointing toward the object making the sound when heard the same in both ears. It was placed on several vessels, but seems not to be generally adopted, although a very efficient equipment. The submarine bell now on most vessels picks up and indicates the direction of sound originating under water. An extension of its use will be to locate bodies echoing sounds originating on the vessel carrying it. As an incentive to radio experts, I suggest a needle which will place itself in the line of waves radiating from another vessel and so point to it. It is probable, too, that a wireless

outfit of tension radically different from the main message outfit will be installed for feeling out in thick weather other vessels within a radius of twenty miles. Bells can doubtless be rung by wireless to warn of another vessel's approach.

Icebergs may be encountered quite far south, so that the present practice of adhering to certain lanes, depending upon the season of the year, will doubtless be continued. But vessels, when warned of the presence of ice or while in the ice region during certain seasons, will doubtless be required to slow down in heavy or very dark weather and will close water-tight doors in the principal bulkheads. But how much better to have no doors in them to close!

More attention will be paid to the lookout station in construction and location, and the obvious requirement is that two men be carried there at night and in thick weather, and that proper means be taken to insure that the men continue awake and alert.

The building of vessels of great size and speed calls attention to the fact that, apart from size, there is but little difference in appearance between the vessel of forty years ago and to-day. A radical recast of the above-water structure is necessary to better adapt vessels to great speed in heavy seas, and in such an evolution the safe launching of passengers will have to be given great consideration.

But it is to life-saving appliances on existing vessels that attention is now directed. It takes some knowledge of the sea and its ways to understand the boat question. In placing boats on sea-going vessels many things must be studied. The arrangement of the boats for lowering, the lifting of covers, the removal of the outer chocks upon which the boats rest, the disposition and lead of the falls, getting the passengers into the boats in safety, lowering and releasing, are all matters of first importance. When speaking of the "small boats" of a vessel it must be kept in mind that they are not small. Such boats not only require practice in getting ready to lower, but when lowered down the high sheer side of a liner the greatest skill is required, in breasting off, to keep the boats from smashing against the side and the greatest judgment demanded in releasing them. Boats are not lowered into the water, but are dropped when some distance above it, and if dropped at the wrong instant are apt to be thrown against the side. No boats should hereafter be carried on curved davits when stowed inboard. A

few boats for quick lowering may be carried on such davits already swung out, but davits of the Welin type should be required for the regular ship's boats. The *Titanic* went down in a quiet sea, but had there been even a moderate sea on the casualties would have been much greater. There should be boat and raft accommodation enough for every one on board, and that we may have this on existing ships many more boats must be carried. The unsinkable life-boat is the best where it can be carried all ready to lower. But the conditions of the *Titanic* accident may be seldom reproduced, and a list to one side, for example, would soon render lowering from the other side impossible. The collapsible type with substantial wooden bottom is a good emergency substitute when life-boats enough cannot be carried at davits. The life-rafts have great value, but they should be made much larger than at present. To stand fifty feet in the air and look down into cold, dark water tries the nerves in a way to deter many from jumping into the sea even with life-belts. This difficulty might be overcome if chutes were constructed running down the sides, something like the usual ship's gangway, which delivered those using them well clear of the vessel to be picked up. Such means would seem preferable to being lowered in a heavy sea. The handling of boats by power-derricks is not desirable, as the power supplied from below may fail. Large boats, housed over, in which passengers could be stowed away till the boat had been hoisted clear and dropped into the water would be safer if power-lifting could be depended upon, and these could have their own motive power, for it is a safe assertion that many more men can run an automobile engine than can pull an oar. Eventually all the ships' life-boats will be fitted as motor-boats. A short time ago a steamer plying on the Mediterranean fitted one of its life-boats with a standard motor and coupled the motor to a dynamo as well as to the screw, with a view to furnishing power for wireless work if the main plant gave out.

Of course there is no excuse if the boats are not properly fitted and all automata in perfect working order. There comes a time when the wooden life-boats may leak, and many vessels carry metal life-boats. The ordinary canvas folding-boat does not secure the confidence of sea-going men, though very good for inland water navigation.

In the confusion following an accident it is very hard to

get people into the proper boats. Many ways will be adopted before the best practice is secured. But we should, at any rate, begin with giving every passenger a card stating the number of his life-boat and a printed request that he take an early opportunity to inspect the boat. As soon as possible on the voyage there should be a boat drill, the passengers being urged to witness it and a few asked to take their places in the boats. While legislation will be drastic and compelling, it is to be hoped it will be general enough to encourage improvement in life-saving equipment.

In future it would be desirable if in large vessels a part of the vessel aft were built with metal top and bottom and so secured that it could be launched overboard as a floating pontoon or raft in case the vessel sinks. In such structure there could be a small wireless outfit and some provisions in a concentrated form.

Another means of safeguarding has been proposed—namely, the sailing of vessels in pairs—but this plan does not seem to have much to commend it. As a rule, lines do not add new vessels in such numbers as to render this possible, and to couple up an old vessel with a new one simply reduces the new to the level of the old.

Safety at sea will be greater as an outcome of the accident, but progress must not be barred as a result, and in connection with inland water navigation it is to be remembered that much is properly permitted which could not be allowed on the ocean.

We have in our battle-ships devices to show when water enters compartments, and by simple and economical devices it would be possible to have the depth to which water has risen indicated on the bridge, and on merchantmen as well as on our men-of-war search-lights should be carried.

Vessels will be made progressively better, stronger, safer, and speedier. Luxury and comfort are not in themselves bad, but travelers have a right to expect that they are added by the naval designer after providing every proper device for safety. We have had a sad awakening to the fact that, while we have applauded progress and improvement in ocean liners during this generation, laws affecting their management in the interest of the traveling public have not kept pace with advance in construction. Lewis Nixon.