The Future of the Large Marine Gas Engine.

The eminent marine engineer, F. E. Elgar, in a paper recently read before the Engineering Conference at the Institute of Civil Engineers, London, dealt fully with this interesting subject, the most important part of which, perhaps, was an able recapitulation of the characteristics of efficiency, safety, and economy, which are indispensable if this type of engine is to succeed in the larger sphere so ardently desired by its advocates. He said :—

1. The engine must be reversible.
2. It must be capable of being quickly stopped and started, either ahead or astern.
3 It must be capable of being promptly accelerated to any speed between dead slow and full speed, and of being kept steadily at the required speed for any length of time. "Dead slow" ought not to be faster than one-quarter of full speed, and should be less in very fast vessels.
4. It must be capable of running continuously for long distances, with but short intervals between the runs, without risk of stoppage and breakdown.
5 It must be capable of working well in rough as well as smooth water, or in seaway in which the variable immersion of the propeller causes fluctuating resistance.
6. All working parts must be readily accessible for overhauling, and all working parts must be capable of being promptly and easily adjusted.
7. The engine must be economical in fuel, especially at its ordinary working speed.
8. It must be compact, light in weight, and well balanced, so as not to cause vibration.
9. It must not involve any risk of accumulation of gas in the ship, such as to form an explosive mixture.
10. Above all it must be capable of using a fuel whose supply at a moderate price is practically unlimited, and can be readily obtained in any part of the world a ship might visit.

Referring to published plans for installing gas and oil machinery in 16,000-ton battleships, Mr. Elgar maintains that "this exists at present in imagination only." "It is impossible" he continues "for any one to judge by what has been achieved up to the present in this direction, what weight or space or what consumption of fuel would be required for the internal combustion engines of great power, that might, perhaps, ultimately be made to fulfil the onerous requirements of marine work. Engineers and metallurgists may by working together succeed some day in overcoming the difficulties of producing large cylinders which will stand the high impulses and great and rapid vibrations of temperature that occur with internal combustion, but until this is accomplished no great step ahead has been taken."

On this the *Iron Age* remarks —

There are those who will be inclined to consider this view extreme. Many installations of large internal combustion engines have been successful ashore. It is natural to be credulous that in the future engineers may solve the problems of any new branch of engineering. Many times in the past a few years have sufficed to contradict the most distinguished disbelievers.

Another paper read at the conference told of the progress made with the marine steam turbine, which has grown in its application from the tiny *Turbinia* of 1894, to the gigantic *Lusitania* and *Dreadnought* of to-day. A curve showing the total horse-power of steam turbines applied to marine propulsion has its beginning at zero in 1896, and its end at 390,000 horse-power in 1906. It is doubtful if many engineers at the advent of the *Turbinia* expected a turbine-propelled *Lusitania* within 10 years. Repeated instances of the sort have bred a confidence in the world's engineering genius, that warrants hope for great ships propelled by combustion engines in the comparatively near future, and cheaply, perhaps with crude oil, perhaps with alcohol or other clean fuel.

Yet Mr. Elgar's list of qualifications that the engine must possess is by no means unreasonable. It would be difficult to eliminate one of them. Some of the problems have not been nearly worked out in their application in a large sense, and others will require a good deal of advancement before they are completely solved, even for small powers. In large ships the engines must be as safe and sure and economical as the reciprocating engine or the turbine. The large power unit installed on unyielding, immovable foundations in a stationary power plant is surrounded by very difficult problems from those the marine engineer must face in applying the same type of engine to a large vessel. His difficulties are fully as great as those encountered in the development of the steam engines and perhaps they are greater, because of the nature of the fuel and of its application to the engine. Great progress has been made with the marine combustion engine, but few will dispute that it is still in comparative infancy. The question is, how soon will it reach the maturity of an accepted type of engine for large ships.?

Water in Anthracite Mines

The quantity of water delivered to the surface per minute is of interest as an evidence of the great expense entailed upon the anthracite companies in connection with the mining and preparation of anthracite for market. An average of the amount of water pumped per minute during the last six years is about 445,000 gallons, which amounts to 233,892,000,000 gallons per year, or 870,000,000 tons. In addition to the pumps used for unwatering the mines, there are many bailing plants used, and while the Department of Mines has not gathered the data for these bailing plants, such data as have been published show that probably 50,000,000 tons of water per year is bailed from the anthracite mines. During this period there has therefore been raised about 15 tons of water through the year for every ton of coal brought to the surface, the average production during the year in question having been 60,721,590 tons per year. In order to take care of the water during times of excessive rainfall, it is necessary to have a pumping capacity of practically double the average amount pumped. As is well known, in certain regions at certain times of the year even this capacity is not sufficient to keep the mines unwatered, hence it is fair to assume that at certain times at least 30 to 50 tons of water are being brought to the surface for every ton of coal raised.—*Mines and Minerals.*

There are now 150,000 acres devoted to rubber in Ceylon, an increase of 47,000 acres in one year.

* * * * * *

In the Baltic Sea more wrecks occur than in any other part of the world, the average being one wreck a day all the year round.

Correspondence.

CANCER AND ITS CURE.

On the above important subject, which has lately been the cause of much discussion in connection with a system of alleged cure practised by the well-known Dr. Beard, we have to thank Dr. G. Hamilton Rowlands for a letter, from which we take the following cogent extracts :—

"The discovery of an actual cure for cancer would be the event of the century, and every medical journal would be full of it, and every medical man would be roused to extreme enthusiasm. Honours of every description would be heaped on the lucky discoverer, whoever he was and wherever he hailed from. There have been so many so-called "cures;" the "three electricities" of that arch-quack Count Mattei, to the many instances where an honest and scientific man has been led by enthusiasm, by coincidences of the *vis medicatrix naturæ*, or by a combination of these causes into a genuine belief that he has solved the great problem. It should be needless to state the fact that any method that is backed by anything like sound evidence will be given a fair trial at one of the London hospitals. Even the Mattei treatment, though it carried no scientific weight, purely on account of the faith reposed in it by dupes of all classes, was given a trial, and it will be remembered that it was not until it was proved that the "three electricities" consisted solely of three bottles of coloured water that the faith of its devotees was shattered. Not, indeed, until the Count had amassed a large fortune. There are some, no doubt, who think there was something of genius in the very boldness and simplicity of the fraud; genius, however, grossly misapplied in false pretence and robbery in victimising suffering humanity.

"With regard to Dr. Beard's pancreatic treatment it is not suggested that Dr. Beard is a charlatan or that the advocates of his treatment are other than honestly convicted. They believe what we are all so anxious to believe, and in the heat of their enthusiasm cool, calm, scientific judgment melts away.

"Is it to be imagined that the medical man, who of all people, except its actual victims, is most intimately acquainted with the ruthless, relentless and agonising ravages of the cancer scourge, who almost daily witnesses the pathetic, the heart-rending, the hopeless struggle, and has to stand by in painful impotence (his means of help being limited almost entirely to the morphia syringe), would not welcome from any source any remedy that would place in his hands a weapon to fight the most terrible evil that human flesh is heir to ? No sane person can calmly think such a thing of a profession that is devoted to the relief of suffering; whose history contains many monuments of noble self-sacrifice in the cause of duty, whose ranks contain many, it may be obscure (they do not advertise), of the type that has been immortalised in the Dr. William MacLure, of Ian MacLaren. Nor is it possible that the medical profession would subscribe to and tolerate their leading journals if they showed illiberality of thought or unfairness in their views.

"Unfortunately, Dr. Beard's pancreatic treatment, having been subjected to a fair trial at the Middlesex hospital and by the workers of the Imperial Cancer Research Fund, has proved a complete failure. It is moribund."