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VICTORIA.

As a journal devoted to the interests of the arts and sciences, we offer our tribute of respect to the august sovereign, whose reign of three score and three years, just closed, has witnessed an advancement of mankind in the arts of peace for which there is no parallel in the history of the world.

How far the manifold virtues of the Queen conduced to the industrial pre-eminence of the people over whom she ruled—a pre-eminence which is only now being challenged—is a matter for conjecture; but if, as some affirm, the stability of a nation is to be measured by the purity and strength of its home life, we may well believe that to this noble lady who was at once a model mother, wife, widow and Queen, much of England's greatness is due.

In an age which is, or is supposed to be, less sympathetic and more cynical than any that preceded it, there is something profoundly reassuring in the universal wave of regret that swept around the world with the tidings of her death; for, in the instantaneous and unsolicited display of sympathy that broke forth, as in this city, in a thousand half-masted flags, we see the impulsive tribute of this twentieth century world to a lady who, amid the unbounded opportunities for display and self-aggrandizement that surrounded her throughout the sixty-three long years of her reign, preferred always to be queenly among women rather than queenly among queens. Yet she was both; and it is in the happy commingling of her public and private virtues that she has won the love of her people and the profoundest respect of the civilized world.

THE NAVAL BILL.

The bill which has just been reported by the House Committee on Naval Affairs is considerably the largest that has ever come up for the consideration of Congress; and yet, great as is the total, it is certain that every dollar of the money asked for is required, if our navy is to keep pace with its ever multiplying and widely extending duties. The annual appropriation bill reaches about $80,000,000 and even this great sum does not include the new ships which are contemplated in this year's programme of construction. Four vessels of the first class are asked for two of them to be battleships whose cost, exclusive of armor and armament, is put down at $3,850,000 each, and the other two are to be armored cruisers of 14,000 tons displacement, which are to cost, exclusive of armor and guns, about $4,000,000 each. The total cost of these vessels, $15,700,000, is not reckoned in the appropriation bill, however and if this sum be included the total amount required reaches about $95,000,000.

The $80,000,000 are to be devoted to the work of bringing up, not merely our existing ships, but the dock yards and building and repair plants on shore, to that high standard which is necessary, if our navy is to be at all times in a position of proper efficiency. As a matter of fact, our equipment on sea has developed in recent years far more rapidly than our equipment on land. The navy needs dry docks, repair plants, coaling depots, naval magazines, and supplies of ammunition, besides a thorough overhauling of the battleships and cruisers, docks, and machine shops which have already seen longer or shorter periods of service. Twenty-five millions are called for under the head of construction and repair, while $11,000,000 are to be devoted to the naval stations, docks, and navy yards throughout the country Coaling stations and dry docks do not appeal to the popular imagination, nor make as brave a spectacular show as battleships and cruisers, but to the naval strategist it is known that upon their existence may depend the issues of a naval war and life of a maritime nation.

YACHT RACING AND THE TOWING TANK.

For reasons which are to be sought on both sides of the Atlantic, the international yacht races of 1901 promise to have a special interest. Not since the year 1893, when there were no less than four yachts, each of a distinct type constructed for the defense of the cup, has there been a contest in which America was represented in the preparatory trials by more than one new yacht. The "Defender" was the only boat built specially for the contest in 1895, and in 1899 "Columbia" was the solitary champion. This year the defending yacht will be selected from two, and possibly from three, competitors, two of these being out-and-out, fin-keel boats, and the third, if it should ever be built, being a typical American centerboard, broad and shallow.

English yachtsmen will content themselves, as usual, with a single representative, the formidable task of defeating the best this country can design and build being intrusted this time to a designer, Mr. Watson, who more than any other has been identified with the English attempts to win back the "America" cup. The distinctive characteristics of Mr. Watson's boats are pretty well known on both sides of the water; but particular interest attaches to the new yacht, from the fact that it is being built at the well-known Denny yard on the Clyde, and that Watson has availed himself of the opportunity thus afforded for making use of the invaluable services of the towing tank in designing the hull of the new challenger, which, by the way, is to be known as "Shamrock II."

It has long been a matter of surprise to naval men that yacht designers have not sought to obtain the valuable data which could be secured by testing exact models of their yachts in the towing basin. So accurate are the results obtained with the models of battleships and cruisers, that it is possible to predetermine how much horse power will be necessary to drive a ship at any given speed, by the simple expedient of towing a model of the same at a given rate of speed through the water, and noting the pull on the towing line. Of course, the problem would be complicated in the case of a yacht. Unlike a warship, she is always sailing at a greater or less angle of heel, and consequently the form of her immersed portion is constantly changing. This complication of the problem makes the peculiar value of towing tank experiments all the more apparent. A form of hull which is easy to drive under a small angle of heel may drag heavily under a larger angle, a fact which was proved in the case of "Valkyrie III." and of "Shamrock." Both of these vessels held their own fairly well with the American yachts in light airs; but they were quite unable to compete with them when the course was sailed in a heavy breeze, and the yachts were borne down until lee-rails were awash. Some peculiarity in the modeling of the run and quarters of the English challenging yachts has caused them to roll up a quartering wave, that acted as a heavy drag when the speed ran up to 12 or 13 knots an hour. Thus, "Valkyrie III." drew rapidly away from "Britannia" and "Ailsa" in the light airs that prevailed in her earlier trials on the Clyde; but in the strong wholesail breeze of her third race, when the lee scuppers were awash, she pulled after her a quartering wave whose magnitude is easily seen in the well-known photographs representing this eventful race, in which, by the way, she was easily beaten by the three-year-old "Britannia." The same defect was seen in "Shamrock" in her third race for the cup, when, in spite of the assistance of a huge club-topsail, she fell steadily behind the cleanly-modeled "Columbia," although this beautiful craft had doused her topsail and was sailing under easy canvas.

Whether the towing tank will enable Watson to determine why it is that his boats, which are superb in windward work, are invariably so poor in reaching in a strong breeze, is a question which will best be answered off Sandy Hook next summer. By careening the models to the angle of heel which they would assume in a strong breeze, and by adding weight as an equivalent to the vertical component of the wind pressure, it will be possible to produce conditions practically identical to those which occur in a race; and it ought not to take very long to discover what combination of run and quarters will give the least disturbed wake and the smallest stern wave, consistent with the maximum amount of sail-carrying power. If Watson is thus enabled to produce a yacht that is as good in running and reaching as his vessels have always been in windward work, we may look for a closer contest than we have witnessed in recent years.

THE IMPORTANCE OF REGISTERING TRADE MARKS

We have from time to time called the attention of our readers to the importance of registering their trade marks in any foreign countries with which they may be carrying on export trade. It is not thoroughly understood that in many foreign countries the first applicant receives the right of using the mark, although he may not have originated the same and may not be the rightful owner. The hardship which arises from such instances is very great and cannot be too fully understood by our manufacturers who are now engaged in export trade. The following cases have been reported by the United States Consul at Berlin:

"For several years past the Griffin Manufacturing Company, of New York, has been selling to the German trade through its agents—a German firm in Hamburg—a polishing paste for leather, each box of which bore its duly registered American trade-mark, viz., a "griffin," the fabulous antique monster, with the body of a lion and the head and wings of an eagle. As the Hamburg agents neglected to register this trade-mark in Germany, a certain maker of varnishes and similar goods in Berlin did so in his own name, and then, in April last, warned the Hamburg firm that they must not handle or sell in Germany any more goods bearing the griffin trade-mark without first purchasing his right to do so. As proceedings were threatened to enforce this mandate, the manufacturers in America, not choosing to submit to what they considered a species of blackmail, sought to avoid further complications by devising a new trade-mark for their goods intended for Germany, in which the picture of the animal was omitted and a device substituted consisting of a capital "G" with the legend "Mfg. Co." printed on a scroll across the letter, the whole showing that the preparation was made by the "Griffin Manufacturing Company," of New York. Thereupon the Berlin claimant returned to the attack, declaring that he had obtained exclusive legal right to the word "griffin," and threatening proceedings if any further goods were sold under the name of the Griffin Manufacturing Company. This latter claim is probably untenable, as article 13 of the German statute for the protection of trade-marks clearly proves that no person can be prevented from using his name, the name of his firm, his place of business, etc., either in full or abridged form on his products or on the wrappings or packages which cover or contain the same.

The second instance is technically similar but morally somewhat less aggressive, as the claimant acted under different antecedent conditions. This was a case in which a merchant in Berlin who had several years ago imported, advertised, and introduced a certain American fruit sirup found that it was being imported and sold by other dealers, and sought to obtain from the makers the exclusive handling of their product for the trade in this country. This being refused, he had the special name of the sirup registered as a trade-mark under the German law, and sought thereby to enforce his claim to exclusive control of its sale to dealers in this country, or, failing in this, to compel the American manufacturers to purchase his claim to their trade-mark. This he felt justified in doing for the reason that he had been instrumental in introducing their product in what had proved a profitable and permanent market.

All these complications may be avoided if Americans or other exporters who seek to introduce into Germany goods protected at home by a trade mark will first register such trade mark in Berlin."

ELECTROLYTIC PREPARATION OF PHOSPHORUS.

A new apparatus for the electrolytic preparation of phosphorus has been recently patented in Germany. The apparatus generally used for this purpose have certain disadvantages, one of these being that it is necessary to take out the residues and give a thorough cleaning before operating upon fresh quantities of the material to be treated; such are the Parker, Robinson and Readman, the apparatus most used at present. In these, pure phosphate or a mixture of phosphate and sand or carbon is used, and the results are on the whole satisfactory; they present, however, the disadvantage already mentioned. The Dile apparatus, on the contrary, is claimed by the inventors to work continuously, and requires no other manipulation than that of introducing a fresh quantity of material after each is exhausted; phosphoric acid mixed with coke or charcoal is used in this case. The residue of the process is insignificant, and it gives a considerable economy of energy and of material used and the results are claimed to be more satisfactory. The apparatus is quite simple in its construction. It is composed essentially of a cylindrical recipient provided with an opening through which passes the negative carbon; at the top is also a funnel-shaped opening for introducing the material. The bottom of the cylinder is formed by a positive electrode of carbon. The negative electrode is supported at the end of a rod which is threaded and has a handwheel at the exterior so that the carbon may be raised or lowered to place it at the proper distance from the bottom. In ordinary cases the phosphoric acid has a concentration of 60 deg. to 70 deg. Baumé; it is mixed with one-fourth or one fifth of its weight of carbon in rough powder and the whole is introduced while hot into the apparatus. The current used depends upon the capacity of the apparatus and the arrangement of the electrodes. The electromotive force used is about 120 volts, with a current of 80 to 150 amperes. As soon as the greater part of the phosphoric acid is decomposed, the current is interrupted for an instant, and a portion of the mixture is introduced. The preparation then continues and so on indefinitely, without taking out the residues or cleaning the apparatus at frequent intervals.