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The editor is always glad to receive for examination illustrated articles on subjects of timely interest. If the photographs are *sharp*, the articles *short*, and the facts *authentic*, the contributions will receive special attention. Accepted articles will be paid for at regular space rates.

THE TRIUMPH OF THE SCOW.

Among the many conditions that contribute to our apparently impregnable defense of the America cup, not the least important is the great popularity in America of the smaller classes of racing yachts, of from 21 to 30 foot measurement, and the rich store of experience which has been gained by our younger architects in the designing and building of these small craft. To the influence of the Seawanhaka cup (which for many years past, in the hands of its present Canadian holders, has seemed about as impregnable as the America cup itself) is no doubt to be largely attributed the development of the vast fleet of small racing craft which forms such a picturesque element in our waters during the summer season. On account of the relatively small cost of these boats, and the absolutely free hand usually given to their designers, every possible form of model and variation of sail plan has been tried. Several seasons ago it had been proved beyond a doubt that what has come to be called the "wholesome" yacht of reasonably large displacement, moderate beam, easy lines, and small sail plan, has no chance whatever in competition with the broad-beamed, shoal, light-displacement craft, with enormous overhangs, which has come to be known by the thoroughly descriptive and generic name of "scow." Of course, the scow has its limitations. In light breezes and a troubled sea it has a way of standing bolt upright, slatting the wind out of its sails, and moving with sluggish and leewardly gait through the water, while its sweeter-modeled and rounder-bodied sister, despite its smaller sail power, was eating its way comfortably to the weather mark. These conditions, however, are comparatively infrequent; and as soon as there was any heart in the wind, the scow moved so fast through the water that the advantage of higher pointing by the other type was easily wiped out, and in nine times out of ten, the boat with the larger sail spread was first home across the finishing mark. It was only a question of time when the success of the scow in the smaller classes should lead to the incorporation, in a modified form, of its principles in the larger yachts. When Gardner brought out his "Weetamoe" and "Neola" and Crowninshield his "Independence," it was proved that with proper modifications the speedy qualities shown by the scow in the 21-footer could be repeated in the 60-foot or 90-foot racing yacht. Had she been the fourth or fifth 90-foot racer to come from the Crowninshield board instead of being the first, there is not the least doubt that "Independence" would have proved much the fastest boat in the "Columbia"-"Constitution"-"Independence" trials. As it was, she contained errors both in form and construction which were due to the facts, first, that her designer followed too closely the lines of his successful 21-footers and secondly that he had no accumulated constructive data to work upon.

We never doubted for a moment that when the new yacht that was to be built by Herreshoff to meet "Shamrock III." made her appearance she would embody the characteristics of shoal body, full waterlines, and long overhangs and excessive sail plan that distinguish the scow type. It was evident that in "Constitution" Herreshoff had developed the normal type to about its ultimate possibilities, and it was pretty certain that, of the rival designers, the one who struck out boldly in the direction of the scow would fly the winning flag in the next series of international contests. When "Shamrock III." came over here and went into drydock it was evident that she conformed entirely to the type of boat to which "Shamrock II.," "Columbia," and "Constitution" belonged, and a great deal of the interest attaching to the present races is due to the fact that in "Shamrock III." we see an attempt to beat the scow type by a vessel of what might be called the normal design. The closeness of the contests proved that Fife has carried the development of the normal type further than Herreshoff was able, for "Constitution," except in absolutely smooth seas and light winds, was never able to push the "Reliance" as closely as "Shamrock III." has done, especially when sheets were hard aboard. What was true of the 21-footer is true of the 90-footer, namely, that the boat with the larger sail spread and smaller displacement will win out against a boat of larger displacement and carrying a relatively small rig. As a matter of fact the displacement of "Shamrock" is about as large if not greater than that of "Reliance"; yet such is the power that is gained from the scow form, that the "Reliance" is able to carry about 14 per cent more sail area on equal or less displacement. It is a great tribute to the skill of Herreshoff that in adopting the scow type he should have modified its objectionable features to such an extent that "Reliance" appears to be relatively just as fast if not faster under conditions supposed to be unfavorable to her type as she is under those in which the scow has hitherto done its best work. It is equally to the credit of Fife that, while retaining the wonderful windward qualities of the more normal boat, he has so improved the reaching qualities that on this point of sailing she is practically a match for the "Reliance" in spite of the 120-foot waterline on which the latter sails when heeled to a scupper breeze.

"SCIENTIFIC HOOLIGANISM" AGAIN.

The claim to perfect secrecy of wireless messages suffered another shock last week during the yacht races, when the Marconi and the De Forest wireless messages were interfered with by some "scientific Hooligan" as Prof. Fleming would call him. The scientific world is still chuckling over the clever work of Mr. Neville Maskelyn in upsetting Prof. Fleming's claim that tuned messages could not be intercepted or interfered with, and the trick was justified on account of Mr. Maskelyn's motive and the fact that he did not maliciously interfere with Prof. Fleming's lecture. Mr. Maskelyn's unknown imitator in this country, however, went to a spiteful extreme in entirely interrupting with floods of profanity and obscenity the news for which the public was eagerly waiting. The perpetrator of such a cowardly deed should be vigorously prosecuted, the act being similar to that of severing telegraph or telephone wires. The difficulty of apprehending such vandals will always be great, and for this reason the question of safeguarding wireless messages should receive renewed attention. The fact that tuning of systems has failed to accomplish all that was required of it is confirmed by the statement of the De Forest Company, that prior to the races an understanding was entered into with the Marconi Company whereby their respective systems should not be worked simultaneously to interfere with each other. The character of the telegraphic signals received on these two systems is very different. In one system the dots and dashes are short and sharp; in the other they are of much longer duration, and we are informed that it is possible for two operators to receive on one receiver messages sent simultaneously from a Marconi and a De Forest transmitter, provided one operator devotes his entire attention to the Marconigram while the other pays strict attention to the De Forest message. Now if, with systems so different in character, it was thought best to make arrangements for non-interference, how much more necessary would it have been to prevent interference in systems using approximately the same length of telegraphic signal.

Wireless telegraphy is essentially similar to heliographic signaling. As the Hertzian waves are invisible, there is used in wireless telegraphy an electric receiver which Lord Kelvin has aptly called the "electric eye." To carry out our comparison, all efforts so far have been made to cause the light flashed out to have such a wave length or color as the "electric eye" is best adapted to receive. The failure of this attempt is due to the fact that the "electric eye" does with varying efficiency receive Hertzian waves of greatly varying lengths, the difference in efficiency being too slight for practical detection. One thing seems to have been forgotten—the "eye" as now arranged is capable of receiving waves from every point of the compass, and similarly, the transmitting station spreads out its waves to all parts of the horizon. Why would not a practical solution of the difficulty be the use of a lens for focusing the rays directly on the "electric eye," and furthermore, of providing "electric spectacles" as some one has called them, for the "electric eyes" themselves? It is well known that Hertzian waves can be readily focused by the use of a lens made of pitch, and such an arrangement would cause the "electric eye" to see most plainly those rays sent from one particular direction, while all outside sources of Hertzian waves would affect it to a comparatively small degree. If necessary, these rays might be screened off by a screen of wire or plate-metal.

THE GREAT SUBWAY POWER PLANT.

New York city contains more power plants of unusual size and capacity than any city in the world, and the remarkable thing is that each successful plant that is built exceeds greatly its predecessors. By far the most imposing of these is the generating station which is now being built to supply power for the Rapid Transit Subway. It is located on the Hudson River at Fifty-eight Street, and the building covers a plot of ground 200 feet in width by 700 feet in length. Its enormous proportions must be seen to be fully appreciated; but a fair idea of its size is gathered when we state that it is nearly twice as large as Madison Square Garden in this city. By the time it is fully equipped, it is estimated that its cost will have reached seven million dollars. When the complete plant has been installed and the station is working up to its fullest capacity, the combined power of the generators will reach the great figure of 130,000 horse power. The great coal bunker which will be constructed immediately beneath the roof and extend the full length of the boiler room, will have a capacity of 25,000 tons, or sufficient, if it were completely filled, to run the plant continuously for nearly a month. The coal will be brought to the docks at the river end of the building, where it will be raised by belt conveyors to an elevation of about 80 feet above the street, carried for the full length of the bunkers, and automatically dumped wherever it is required. From the bunkers it will be drawn off by gravity through chutes which terminate above the furnace doors. Here the coal will be delivered into the hoppers of the mechanical stokers, and after it has done its work in the furnaces, the ashes will be automatically dumped at the rear end of the furnace into hoppers, through which it will flow into ash cars, that run upon tracks to the river, where the ashes will be unloaded into scows. A remarkable feature of the building by which, indeed, it may be easily recognized will be the five great smokestacks, each 265 feet in height, and a novel feature in the construction of these stacks is that, instead of the chimneys extending completely down to ground level, they will be carried by massive steel platforms which will extend 40 feet above the floor of the power house. This is done to save a large amount of valuable space which has hitherto been monopolized by the square base of such chimneys. The building is of the usual steel and masonry type. The architectural features promise to be pleasing and appropriate for the size and character of the structure. The exterior wall consists of cut granite up to a certain level, above which it is built of terra cotta and pressed brick, while the interior is lined with chocolate and cream-colored brick for the first two stories, and above that with an attractive shade of buff brick. In spite of the serious delays which have been caused by strikes, it is expected that this, the largest building in the city, will be completed early in the coming year.

ELECTRICITY ON THE MIAMI AND ERIE CANAL.

Both direct-current motors and polyphase alternating-current motors have been used with more or less success for electric canal haulage, not only in Belgium and other European countries, but also in America. Recently electric haulage has been utilized on the Miami and Erie Canal, and this is said to be the first three-phase traction system in the United States. This canal cost with its reservoirs about $8,000,000, the latter including the grand reservoir of seventeen thousand acres, the Laramie reservoir of nearly two thousand acres, and the Lewiston reservoir of somewhat over seven thousand acres. The canal ranges from 4 to 6 feet in depth, and in width from 40 to 60 feet along the line from Dayton to Toledo and Cincinnati. The electric haulage on this American canal is largely due to Thomas N. Fordyce. The total distance is about 68 miles, and a standard single-track road is provided along the towpath of the canal. From five to seven canalboats are hauled by each electric locomotive, the current being taken from overhead trolley lines, the track acting as the third conductor. The trolley wires range in height from 7 to 22 feet, the former being that used under the various bridges in Cincinnati. The feeders are stranded aluminium wire and the trolley wires are No. 0000 G. E. grooved wires mounted on flexible brackets. The current is supplied from the power plant of the Cincinnati Gas and Electric Company and has a frequency of 60 cycles and a pressure of 4,000 volts.

At the Spring Grove substation the current is reduced in pressure to 400 volts, and in phase is transformed by the Scott method of arranging the transformer connections to two-phase. The voltage of the three-phase on the transmission line along the canal is 33,000 volts, and the frequency 25 cycles per second, and to obtain this pressure motor-generators and step-up transformers are employed at the substation. A 300-kilowatt three-phase generator of 390 volts is driven by a 450-horsepower synchronous motor, which is supplied with the two-phase current entering Spring Grove converter station. The 390-volt three-phase current, which then has a frequency of 25 cycles, is raised in pressure by 250 kilowatt step-up transformers to 33,000 volts.

Step-down substations are located along the canal