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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 GANZ SYSTEM AND THE LONDON ELECTRIC RAILWAYS.

There is food for thought in the fact that the directors of the Metropolitan and District Underground Railways have decided to use the Ganz high-voltage, tri-phase system in the electric equipment which is to be carried out on these two important roads. The selection was made from a large number of competing bidders, among whom were included the representatives of the leading electrical firms in this country. It is stated that the choice of the directors was based upon the fact that the Ganz bid was $1,000,000 cheaper than the lowest American tender, and that the operating expenses were represented to be 30 per cent lower than those of the low-voltage, direct-current, system as used in this country. American practice is to generate high-tension alternating current for transmission, and transform it at sub-stations to low-tension direct current for use at the motors, the usual potential being about 500 volts. In the Ganz system, as used in the new Italian road, three-phase current of 20,000 volts potential is supplied to the line, and is transformed at sub-stations to 3,000 volts, at which high pressure it is used directly at the motors. The Hungarian engineers have succeeded in overcoming the difficulties of insulation which are attendant upon the use of such high pressure, and have apparently gained all the resulting economies of construction and operation.

It can justly be claimed that America is the birthplace and the home of successful electric traction. We have hitherto led the world both in the improvement and development of this system of transportation, and to many people it will come as something of a shock that a European firm should apparently have moved ahead of us in the improvement of the art. If the contract should be secured by the Budapest firm it will be but another illustration of the fact that, however supreme a nation may be in any particular industry, it can never afford to rest upon its laurels. It must be prepared to meet an ever-extending competition, as other nations begin to center their intelligence and skill upon the improvement of existing systems and plants.

CUP-YACHT DESIGNING.

Since the year 1893, when four yachts were built for the defense of the "America" Cup, the responsibility of designing a defender has rested upon the shoulders of one man, whose name is identified throughout the yachting world with the fastest craft that have ever hoisted canvas in an international cup race. Although the cup has proved on three memorable occasions to be perfectly safe when its defense was intrusted to Mr. Herreshoff, it is believed that its future security would be better assured if more than one designer were engaged at each contest in the production of an "America" Cup defender. The task of constructing the fragile hull of a 90-footer, and giving it the necessary strength to carry its enormous load of lead below, and above, its towering spread of canvas, requires both skill and experience. Experience and an accumulation of well proved data are especially valuable, for it is a well-known fact that yacht designing is not an exact science, not, at least, in the sense in which bridge construction may be said to be so. Originally the yacht-builder was a man of rule of-thumb methods altogether, and there are even to day many points, both in the modeling of the boat and in her sail plan, which are determined, not by scientific formula, but by the particular fads or prejudice of the individual designer. One man prefers bluffer bows and leaner quarters; another thinks that better results come from a straight, sharp entrance and rather full, broad quarters, as in the "Shamrock" of two years ago. In one sail plan we see the cloths running parallel with the leech, in another they are cross-cut; while the controversy as to whether sails should be as flat as the proverbial board, or whether they should have left in them something of that bagginess to which the English yachtsmen who succumbed half a century ago to the "America" largely attributed their defeat, is still a matter for conjecture. One yachting sharp believes in setting up his rigging perfectly taut; another will tell you, as the father of a noted yacht designer interested in the last cup contest did, that "Shamrock" lost the races because the rigging was not slacked up to the degree which insures getting the best results out of the sails!

All of which goes to prove that there may be more things in yachting philosophy than have yet been dreamed of, and the steady increase in speed which has taken place of late years gives reason to believe that we have by no means reached, in form of hull or in sail plan, the theoretically perfect racing craft. The more designers of cup defenders, then, the more ideas, the more proved and reliable data, the more development, and, most important of all, the less possibility that the successful defense of the cup will cease with the incapacitation or death of one individual.

For this reason we are glad to note that this year there are two yacht designers engaged in the task of defending the "America" Cup, and the more so as the yacht which is being built from Mr. Crowninshield's designs is of a type which will differ very widely in some respects from what might be called the typical Herreshoff model. Although no particulars have yet been given out, it is practically certain that the new Herreshoff boat will be an improved "Columbia," and will embody in herself the accumulated experience which has resulted from the construction and sailing of the "Vigilant" and "Defender" and "Columbia." It is also probable, in spite of certain sensational rumors to the contrary, that the new Watson boat which is building at the Denny's yard will be in all respects a standard Watson craft, the lineal descendant of the "Britannia," "Valkyrie," "Meteor" and last year's "Sybarita." There will be far more likeness between the Watson and Herreshoff boats than there will be between the Herreshoff and the Crowninshield craft; and, strange as it may seem, it is possible that from a yacht constructor's purely technical point of view, there will be greater interest evinced in a contest between the two American craft than there would be between the Herreshoff boat and the English challenger.

The "Independence," whose plans are fully described elsewhere, is an attempt to apply to the 90 foot yacht a form of hull which has been developed of late years in the keen competition between small craft of 15 and 20-foot waterline. In no branch of yachting has greater ingenuity or freer inventiveness been shown than by the designers of these little "raters." A wide variety of models, many of them positively grotesque, have been built and tested: boats of great beam and enormous overhang, flat-ended boats, boats with wing ballast, others with keel ballast, and others with none at all; while out of the competition there has been evolved what is known as the scow-form of yacht, which is, for its size, by far the fastest sail-driven craft with a single hull in the world. The "scow" has enormous overhangs, a flat floor and a hard bilge. Her beam is ridiculously wide; when she is heeled her model is such that her sailing-length is almost doubled, while the weather half of the boat, lifted often entirely out of the water, is depended upon to give the boat stability. The "Independence" is practically of a modified scow form, with the deep fin-keel and lead ballast of the typical 90-footer hung beneath it. When she heels to a breeze her sailing length will be increased far beyond that of any previous cup contestant, and unless there is any serious difficulty with the steering and control of the boat when there is any weight in the wind, the great spread of sail which she will be able to carry, coupled with her relatively small displacement, should render her an extremely fast yacht.

YELLOW FEVER.

Now that we have before us the full and authentic report of the proceedings of the Pan-American Medical Congress held in Havana 4th to 7th of February, the most important subject of which was the presentation and discussion of the report of the special yellow fever commission, we are able to form an unbiased opinion and to estimate to some degree the far-reaching influence which the findings of this commission will have upon the theories of the causation of disease and of contagion and infection, as well as upon vaccination and preventive inoculation.

Summarized, this report is as follows: Yellow fever cannot be communicated by contact with the patient or with the clothes or other articles worn by a patient before and during the course of the disease, although they may be impregnated with the excretion of the body. The disease is, therefore, not contagious. It can, however, be communicated by inoculation if a small quantity of blood from a yellow fever patient, taken during the first two days of the disease, is injected into a healthy person. If, however, the blood is taken later in the disease, or before the attack has set in, no result is obtained.

Yellow fever is communicated, however, by the bite of a particular kind of mosquito (the Culex fascinatus) that has previously bitten a yellow fever patient during the first two days of the attack. It takes twelve days for the specific poison to develop in the mosquito. Healthy persons bitten by such inoculated mosquitoes before the twelfth day after the contamination of the insect showed no symptoms of the disease, while those bitten after the twelfth day, without exception, were stricken with yellow fever after a lapse (period of incubation) of from forty-six hours to six days. Disinfection of houses and belongings of yellow fever patients, fumigation of letters from yellow fever districts, and quarantining of passengers from infected localities would therefore be unnecessary, provided the mosquito were destroyed.

The report concludes: "While the mode of propagation of yellow fever has now been definitely determined, the specific cause of this disease remains to be discovered." In the numerous reports of yellow fever epidemics in this country and abroad, and in the lengthy and erudite dissertations in medical literature, we find that the theory of contagion was by no means universally accepted by medical authorities, and was disputed as early as 1812 by Dr. B. Colomar in his report on the yellow fever epidemic in 1811 in Spain. We can therefore readily accept the demonstration of the commission of the non-contagiousness of yellow fever. There are, however, many peculiarities in the transmission of the disease recorded in medical literature, which cannot, as yet, be fully explained by accepting the statement that the mosquito is the only carrier of the disease virus. It is true we can explain why General Butler succeeded in stamping out yellow fever in New Orleans by establishing proper sewerage and rendering the city habitable and healthful, but unhealthful for the Culex fascinatus, and why the epidemics invariably cease when the average temperature of the air falls below 70 deg. F. For we know that the insect cannot live in clean places or a cool atmosphere.

Other malarial diseases have been stamped out in certain localities by planting eucalyptus trees, which by their rapid growth and greed for moisture drain swampy places, or by the artificial draining of swamps, thereby making it impossible for certain species of mosquitoes which are the carriers of the fever to exist in these localities. We cannot, however, as yet explain in what manner the virus is transported over great distances of land or sea, distances too great for the culex to traverse. We must look for an explanation in the results of experiments which will determine what is the specific virus and what is its origin. For it is very plain, almost self-evident, that it is not a bacillus or coccus. It must be ascertained whether or no the eggs and larvæ of the infected mosquito (for it is the female insect only which sucks the blood of animals) carry within them the specific poison in a latent form to become potent in the fully developed insect, and if so what are the most favorable conditions of climate, temperature and surroundings for the development and life of the insects. Finally we must learn what is the most practical and effective method of destroying the insects and their eggs and larvæ.

When these questions have been answered we will be able to stamp out yellow fever and a number of other epidemic and endemic diseases and make the so-called "foci" of such diseases as yellow fever in Havana and the West Indies, and cholera in India, salubrious instead of disseminating depots of scourges for the whole world.

NEW METHOD OF AERIAL TELEGRAPHY.

The ingenious system devised by M. Paul Jegon for use in aerial telegraphy has for its object the localizing of messages sent by a given transmitter, so that of a given number of receivers within its radius of action, each post will receive the message intended for it and no other; it is not intended to assure the secrecy of the message. Each of the receiving stations has two masts of unequal length, and each of the masts is provided with a separate coherer and battery. The two circuits have in each of them a coil wound upon an iron core side by side, but in opposite directions, so that when a current flows in one of them an induction effect is produced in a third coil wound upon the core, but when both circuits act the effect is neutralized and the third coil is not acted upon. The third coil is connected with a galvanometer to indicate the presence of the signals. The case of two receiving stations of this kind, 1 and 2, placed at different distances from a transmitting station A, may be considered, and it will be found that communication may be made with one or the other at will. The transmitting station has two masts of unequal length, and the longest of these gives waves which are