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Contents:

(Illustrations are indicated by an asterisk.)

INVIDIOUS COMPARISONS.

A great many good and loyal journals, who have the welfare of the country at heart, seem to think they can best serve it by wholesale abuse of the Navy Department. From the monitors down to the wooden gunboats there is scarcely a craft that has not come in for some disparagement. We deprecate such a state of things in any event, but especially when unthinking journalists throw reason aside and make invidious comparisons for the sake of gratifying a pique.

The Boston *Commercial Bulletin*, in an article on blockade runners, says:—"The British have now afloat a superior class of swift steamers to run the blockade, while we have only the same old-fashioned vessels, many of them worn out, which we had at the commencement of the war. The vessels produced by the Navy Department have proved entirely worthless to overhaul the swift steamers sent from England. To show how blind was the Department at the beginning of the war, it is only necessary to refer to the light-draught gunboats which it built, not one of which is capable of being propelled more than eight knots, while the general run of the blockade-breakers go rarely less than twelve, and some of them as swift as sixteen knots. But for the steamers purchased from the merchant service, our blockade would have been a mere farce. It is little better at present, so far as Wilmington, N. C., is concerned. The swift British steamers pass in and out at the rate of two a day the year round, although we have nearly twenty sail of our best vessels to blockade it."

This statement is incorrect in many respects. The British vessels are for the most part built exclusively for river service, and are unfit for blockade duty, and in every case their speed has been grossly exaggerated. The fastest of them are daily caught by our ocean steamers; vessels that can lay off and on and run to sea when storms arise. The light-draught swift English boats are incapable of such endurance, and though they carry immense cargoes last no time at all, nor are they expected to. They make such profits that the owners can afford to use up a ship a month if they please. Some vessels do escape and run the blockade in the darkness; but many more are daily caught, and numbers of the blockade fleet now off Wilmington were once blockade-breakers. Surely if the English vessels are swifter than our own they ought to catch their comrades! The light-draught gunboats, built at the beginning of the war, go faster than eight knots by the pitch of their screws at a moderate number of revolutions, and we have sailed eleven knots per hour in one of them, if the patent logs tell the truth.

The double-enders are as fast as any merchant ships of their class, and have done good service, as Mobile Bay, Albemarle Sound, and engagements at other points amply show. There is nothing to be gained by indulging in phillipics against the Administration at a time when the country requires all the good words from loyal men that it can get. The Navy is a most powerful arm of it, and needs encouragement far more than the reverse. We have no disposition to apologize for any short-comings or failures of the Department, but in the matter of the blockade we believe it is doing all in its power.

A BATTERY OF 15-INCH GUNS.

On a recent visit to Fort Hamilton we found that the New Water Battery is nearly completed, and 6 of the guns are already mounted. They are all of cast-iron, of 15 inches caliber, and are mounted on wrought iron carriages. Beds are being constructed for 24 or 25 more, so that the whole battery will have 30 or 31 15-inch guns. We presume that each one of these cannon would be more efficient in preventing the passage of an iron-clad fleet through the Narrows than all of the guns of the old fort. In other words, the New Water Battery is probably a greater addition to the defenses of this harbor than would be the construction of thirty new forts like Fort Hamilton, provided they were to be armed with the old style of ordnance.

Now we should like to see two 20-inch guns placed at Fort Lafayette, as near the level of the water as possible, each mounted in a revolving turret, the walls of the turrets 2 feet in thickness and built up of as thick plates as can be conveniently made, say 4, 5, and 6 inches. Then with rafts of timber, to keep hostile fleets attempting to pass for awhile under the fire of these heavy guns, we think the southern approach to our harbor would be pretty secure.

THE MOISTURE ON A LAMP CHIMNEY.

Probably most of our readers who use petroleum lamps have observed that when the lamp is first lighted the luster of the chimney is dimmed, and the flame is obscurely seen with the outlines not sharply defined. In a minute or two the dimness disappears, and the glass presents its usual clear and transparent appearance.

This phenomenon is doubtless produced by the deposit of water upon the inner surface of the chimney. Petroleum is composed of hydrogen and carbon, and both of the elements in burning combine with the oxygen of the atmosphere—the carbon combining with oxygen to form carbonic acid, and the hydrogen combining with oxygen to form water. Both on their first production are in the gaseous form, and the carbonic acid being incondensable except under very great pressure, passes off as an invisible gas; but the water, though at first in the form of steam, requires to be cooled only down to 212° to be condensed into the liquid form. As it comes in contact with the cold walls of the chimney, it is cooled to this point, when it deposits itself as a fine dew over the inner surface of the glass.

This water, being very pure, transmits light more freely than the glass, but being deposited in hemispherical drops, the curved surfaces so refract the rays of light from their straight tracks as to prevent the formation of a clearly-defined image in the eye. The thin film of dew, though translucent, is not transparent.

So soon as the heat of the flame raises the temperature of the chimney to 212°, the water is re-evaporated, and passes off as invisible steam, leaving the glass transparent as before.

A NEW LIGHT FOR MANUFACTORIES.

Professor Seely, of this city, has obtained a patent for an electric light on a principle which very strangely does not seem to have been thought of before as the best and by far the most economical mode of producing light by electricity. He employs the current generated by an ordinary frictional electrical machine, and obtains the light by interrupting the current. It has long been known that a very brilliant and steady light might be procured in this way, but the objection to its use is the uncertainty in the action of the frictional machine. Dry air is a very poor conductor of electricity, and when a machine is excited in such an atmosphere the electricity will remain in tension for a considerable time. But moisture in the air conducts the electricity away, and when the moisture reaches a certain point the fluid is removed so rapidly that the machine will not work. Professor Seely's invention consists in devices for making the action continuous in all weathers. This is effected by surrounding the machine with a glass case, and keeping the air within the case dry by means of chloride of calcium or other hygroscopic substance.

It has been observed that when the conductor of an electric current is interrupted in a way to draw a spark across the break, the brilliancy of the spark varies with the material by which the conductor is terminated at the break. Professor Seely is now engaged in experiments to ascertain what material will produce the most intense light.

If the apparatus works according to anticipation a cotton mill may be lighted without any current expense, except the small power required to turn the electrical machines. As in mills driven by water there is always a surplus of power during the winter months, the only time when lights are required, there would be no expense for this light except the first cost of the apparatus, which would be quite moderate.

COOPER UNION—FREE NIGHT SCHOOL OF SCIENCE AND ART.

If the mechanics of this city are not an educated class the fault is their own, for no matter what advantages have been denied them, the privilege is now afforded of becoming proficient in the highest branches of art and science. The halls of the Cooper Union are to open shortly, and there instruction can be obtained by those whose time is employed during the day. Perhaps, however, a better idea of the scope of this institute can be formed by the world at large by publishing its printed circular:—

"The term commences on the first of October and ends on the first of April. The hours of recitation are from 7½ P. M. to 9 P. M., and no pupil is, under any circumstances, to be admitted after the former hour, except by special permission of the clerk. Each applicant for admission is required to be 16 years of age, and to present a letter of recommendation from his employer. No expenses whatever are incurred by the pupils, except those for the purchase of Text Books and drawing materials. All applications for admission must be presented during the month of September. Each applicant is permitted to pursue the study of any subject or subjects taught in the school, provided he is sufficiently well advanced in the preparatory studies. The following is the course of study:—Algebra, Geometry, Logarithms and Plane and Spherical Trigonometry, Analytical and Descriptive Geometry, Differential and Integral Calculus, Mechanics, Natural Philosophy, Elementary Chemistry and Chemistry applied to the Arts, Analytical and Organic Chemistry, Architectural Drawing, Mechanical Drawing, Drawing from Copy, Drawing from Cast, Drawing from Life, Perspective. The full course of study, embracing all of the above-named subjects, requires five terms for its completion, and to those who have successfully passed through it the Medal of the Cooper Union is awarded. Pupils who have successfully completed the study of any particular subject will receive Diplomas certifying to the fact. For a Mathematical course five terms are required, but only three evenings of each week are occupied. For a course in Chemistry and Natural Philosophy three terms are necessary, and but two evenings per week. For a course in Architectural or Mechanical Drawing three terms are required, and but two evenings per week; and for a course in Perspective and Drawing from Copy, Cast, and Life, three or four terms are required, according to the pupil's ability, and but three evenings in each week. At the end of each term an examination of each class is held, and to those pupils who have been regular in attendance and pass through it creditably, a certificate is awarded, either of the first, second, or third grade, according to their knowledge and ability."

All trades and professions even are equally welcome, and persons desirous of attaining higher proficiency in any course are admitted. Lectures will be given by able professors during the course, at