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OPENING OF A NEW DRY DOCK AT NORFOLK, VA.

The great dry dock lately built by the Chesapeake Dry Dock and Construction Company was opened for business on the 24th of April with appropriate festivities. A large company of distinguished personages, engineers, and government officials was present.

The present dock is one of the largest of its kind ever constructed. It is 630 feet long from head to outer sill; 130 feet wide at top and 50 feet at the bottom, and 33 feet deep, with a slope in the bottom of 24 inches to the 560 feet.

The dock is supplied with two centrifugal pumps of a capacity of forty thousand gallons per minute, each of which empties it in one hour and thirty-six minutes.

There is in course of construction a shipbuilding plant alongside of the dry dock which will, when completed, enable the company to do the finest work of construction and repair in the country.

The vessel selected for the first trial of the new dock was the great ironclad war ship Puritan. The dock was lowered and the Puritan was hauled in and placed in position.

Mr. Simpson, the inventor, was present and greatly enjoyed the occasion. He is now quite advanced in years, but is still active.

HEAVY QUICK-FIRING BATTERIES.

A new and interesting feature of British naval armament is the substitution of quick-firing guns for the mammoth pieces heretofore considered indispensable in the battery. These new pieces are not of the pepper-box variety, such as the Maxim, Nordenfolt, Gardner, and old-style Hotchkiss guns, which fire from 350 to 600 small shots a minute.

The investigation of the causes which have led, or rather which are leading, to the abandonment of the mammoth gun principle of armament is an engaging and instructive study. It is not so many years ago when the struggle between gun and armor was in progress.

gun, and this with a ponderous iron vessel, especially if there is much of a sea on, is not an easy task. Slowly the heavy gun is trained into position, and then, presto! the ship under it sways away in the sea and the target is gone!

Then came the torpedo boat—a flying target that to attempt to train a heavy gun upon was but a waste of labor. To guard against this danger, secondary or quick-firing batteries were mounted in the tops and set up on the poop and fo'c's'le.

It is not easy to see, however, how in any fair computation the believer in big ships can cry checkmate to the torpedo boats. As long as such elements as darkness and thick weather remain, as long as big guns belch forth clouds of powder smoke to hang upon the waters, it would seem as if these quick-winged terrors might still remain potent, at least when operating in or from a harbor or roadway.

The Australian Rabbit Pest.

It is stated that M. Pasteur's plan of exterminating the rabbits by inoculation with transmittable virus has proved to be a failure in Australia. The reward of \$100,000 offered by the N. S. W. government for an effective mode of destroying the rodents is as yet unclaimed.

Mr. W. Rodier, of Tambua, Cobar, New South Wales, has forwarded to this society a printed sheet, containing, as it appears to me, by far the best suggestion yet made for the extermination of 'rabbits—a subject to which my attention has been repeatedly called by various correspondents in the Australian colonies, where, as is well known, the damage done by these animals is enormous.

The results of this mode of operation are that the male rabbits, as soon as they begin to predominate in numbers, persecute the females with their attentions, and prevent them from breeding.

This is all strictly in accordance with what we know takes place under similar circumstances in the case of other animals, so that we can readily believe it to be likely to happen.

The ordinary mode of trapping, as Mr. Rodier points out, is more likely to increase the number of rabbits than to diminish them. For reasons which he clearly explains, more buck rabbits are always killed by the trappers than does.

The plan advocated by Mr. Rodier is so simple and easy that I cannot doubt it will be widely followed when known. No disease that might otherwise cause injury is introduced, no other noxious animal is proposed to be imported, but advantage is taken of the well-known natural laws which regulate the increase of life to effect in this instance a salutary decrease.

A Great and Fast Passenger Steamer.

The first trip of the new passenger steamer Puritan, of the Fall River line, from New York to Newport, via Long Island Sound, was made April 24, with much success. She attained a speed of over 20 miles an hour with 65 pounds steam.

**Time Servers.**

How many men there are, holding good paying positions as journeymen, who are really of no value unless kept constantly under the eye of the foreman or their employer! They are simply time servers, who take no interest in the business they represent beyond the actual time necessary to count them a day's work. They work when closely watched because they are obliged to, not from any motive of honor or interest in the business.

What can be expected of such workmen but that they will shirk their work and idle their time at every opportunity?

If you cannot give your employer your full time for which he pays, and take some interest in his business, you had better leave him at once. To this he is entitled, and has a right to expect it of you.

If your mind is not upon your work, you cannot expect to accomplish it with any degree of satisfaction to your employer or credit to yourself.

In going about from one shop to another it is a very easy matter to pick out the time servers. Upon the slightest pretext they drop their work to talk or look about, and are always ready to get out of the door the moment the clock strikes six, and their example is very rapidly followed by the apprentice or younger workmen. They have to be constantly watched, and this fact, being known to the firm, is not long in having its results.

Employers are more generally knowing to the habits and qualities of the men they employ than the men often realize, and they invariably know who are the time servers among them, so that when there comes a convenient opportunity or a lull in business, these are the first to be discharged.

It pays to be faithful and to do your best at all times, and more especially when your employer is not watching. If you must idle away time, do it when he is about, but don't dishonor yourself or betray his confidence by taking advantage of his absence.

This is one of the worst features of our American system. It is an example which is set by the older men, and which is readily adopted by apprentices, and it is the exception rather than the rule that we find a young man who is sufficiently interested in his own welfare and his employer's as well to give his full time and attention to his work. Those who do this are sure of success, and it is from among such that have risen those men whose names are written upon the pages of history as having made their mark in the world, and left behind not only pleasant recollections, but a shining example that is worthy of a careful imitation.—*Harness.*

**The Elementary Substances.**

Professor W. Crookes, F.R.S., in his recent anniversary address before the Chemical Society remarked that the spectroscope gives us a power that enables us to peer into the very heart of nature. In the extent of its grasp, and the varied character of its applicability, it surpasses the telescope, and at least rivals the microscope. The astronomer uses it in studying the chemical composition and physical condition of the sun and the stars as if they were within touch.

The biologist and physiologist find the spectroscope of value in studying the relations of animal and vegetable tissues and fluids. In terrestrial chemistry the spectroscope has already led to the discovery of several hitherto unknown elements. Bunsen and Kirchhoff discovered cesium and rubidium by its use. Professor Crookes found thallium, and Reich and Richter iridium. By studying spark spectra, Lecoq du Boisbaudran discovered gallium in 1875, and Drs. Gladstone and Russell in this country have recently shown that a study of absorption spectra gives very interesting results. In his own investigation of the rare earths he had endeavored to reduce their number as far as possible by a searching examination of their properties, but in this investigation he had found that the task he had set himself was of a very complicated nature.

The rare elements of the didymium group are four in number, viz., didymium, decipium, samarium, and lanthanum, and of these his own work and that of Continental observers prove that didymium has not a simple structure. By using a specially constructed binocular spectroscope, the absorption spectra of different solutions of didymium nitrate could be automatically mapped, and from the results obtained by its use he is assured that didymium is not indivisible. From a recent study of the glow spectra of the pure oxides of the elements, he has found that after successive fractionation of crude alumina, the red glow which is characteristic of this body gives place to traces of a complicated line spectra. By pushing the fractionation still further, he has been able to identify this line spectra with that of decipia, and has reproduced it by adding decipia to the crude alumina. He is of opinion that by the fractionation of the crude alumina he has determined the presence of a rare element, or possibly a meta-element, in the alumina, but must devote much time to the subject before any definite conclusions can be drawn from the work.

In endeavoring to answer the question, What is an

element? it must be borne in mind that, taking didymium as an example, the different methods of fractionation applied to it yield different products, and that it is therefore obvious that even these parts of the original are not elemental in character; in other words, didymium is divisible in different ways. It is evident that chemists have not yet reached the "bed rock." At present we must wait for further light, and open what can be called a "suspense account," of which all these spectroscopically discovered new substances may be provisionally called meta-elements. It becomes more and more probable that between the primitive atom and the molecule there is a gradation of aggregates of varying complexity, and that these aggregates have been mistaken in times past for the elemental atoms.

**Ordnance Work.**

According to the *Engineering News*, twelve six-inch ordnance rifles for the United States government are now being built by contract, six each at the South Boston Iron Works and the West Point Foundry. The forgings and material for the guns are being made by the Midvale Steel Company, of Philadelphia, their contract being directly with the government. The contract for the guns was made last November, with the provision that the first gun should be completed within six months. The construction of the guns is under the supervision of a naval officer, Lieut. Commander Eaton, U. S. N.

The South Boston Iron Works also have the contract for furnishing the gun carriages, gun mechanism, and steering gear apparatus for the double turreted monitor Terror. The price is \$200,000, and it is required that the work shall be completed and erected on the boat one year and six months from May 1.

The gun carriages for the Terror are of the pneumatic type, the recoil and counter recoil is against cushions of air. The gun on this carriage will run on a horizontal plane, instead of on an incline, as in the Sicard carriage on the Boston and Atlanta. The first of these new carriages is already at the Annapolis proving grounds and will be tested immediately. The cost to the government of this carriage is to be \$19,000.

The Terror's guns will be elevated by hydraulic power applied under the after part, the pivoted point being on the gun port. The gun is loaded from a three-cylinder revolver, the gun being lowered after firing until its chamber is in line with that of the cylinder, at which moment a hydraulic rammer pushes the charge into the gun. This arrangement is similar to that used on the Vesuvius.

Besides the work already mentioned, the South Boston Iron Works are furnishing 200 projectiles for the new 12-inch rifle mortar, now at Sandy Hook, and the only one in the United States. The projectiles are of cast iron, pointed, with two copper bands about one-fourth inch wide shrunk on their exterior to permit their taking the rifling. The projectiles cost about \$50 apiece.

**Great Irrigation Works.**

The Russian government decided about a year ago to commence some irrigation works near Merv for the purpose of rendering the crown lands more suitable for the cultivation of cotton, and during the period which has since elapsed the first part of the scheme has been completed. A dam—30 feet high—has been built across the river Murghab, in the Merv oasis, at a distance of fifty miles from the village of Sultanbund, and the vast quantities of water which are collected in this manner are being distributed to the surrounding country by means of a network of sluices and canals. It is confidently expected that the continuous irrigation of the lands will be insured throughout the severest droughts. It appears that the Russians are intending to do their utmost to develop the crown lands in this district, as they are establishing a number of meteorological and other stations for the collection of information as to the temperature, moisture, and rainfall.—*Industries.*

**A New Aliment from Wheat.**

According to *Le Genie Civil*, Dr. Dujardin-Beaumetz recently exhibited at the Paris Academy of Medicine a new alimentary substance—"fromentine"—which is obtained from wheat by the aid of special millstones. Fromentine is the embryo of wheat reduced to flour and deprived of the oil which it contains. The substance contains three times more nitrogenous substance than meat, and a strong proportion of sugar. Thus, the amount of nitrogenous matter in it is 51 per cent, while that of the richest meat, mutton, is but 21 per cent, and the proportion of digestible substance reaches 87 per cent of the total weight. Hence it would appear that it might advantageously replace powdered meat as a concentrated food. It can be used for making soups, and even for making biscuits, the taste of which would not be disagreeable.

The wheat germs employed are a by-product in the Schwietzer process of manufacturing a flour which can be kept for a long time without deteriorating.

**Concerning Moths.**

Regarding moths, says the *Upholstery Trade Review*, many are not aware that the damage is done when the millers commence to fly, as their very presence indicates the absence of the worm. It is to prevent the miller incubating that precautions should be taken. A large proportion of the millers never hatch eggs, but die without causing any harm. The male miller, which does not fly, but runs very rapidly, is quite easily detected by his triangular shaped figure, but, keeping himself out of sight, he is not so easily found. His hiding explains the devious flights of the female in her search. The killing of one male is equal to the extinction of many ordinary millers. The male miller is commonly known by the name of "silver fish."

Carpets are seldom troubled with moth worms except where hatched in a dark, unprotected space, and where it is moderately warm. It is for this reason no doubt that carpet houses are seldom, if ever, troubled by them, the stocks in the larger houses being disposed of between seasons. Nearly all the trouble from moths emanates from the furniture, the burlap inside the outer covering being their best field for work, where they can be free from annoyance and find plenty to eat. Many furniture dealers realize their danger, and cleanse the burlap used with naphtha.

It is when the worms are either tired of their food or it lacks the nourishment that they desire that they seek an outlet and drop upon the carpet.

Cleansing carpets by the naphtha process is regarded as the surest and most satisfactory where there is the slightest suspicion of moth eggs or worms. It is especially adapted to pile carpets. Caution should be exercised as to the purity and clearness of the naphtha used and the thorough extraction of the grease, else the dirt adheres more easily than before. Where carpets are to remain in storage some time, the odor can be left in the carpet. A more thorough cleansing can be assured by having the carpet beaten first. A surface application of naphtha will drive the impurities through the article, to be absorbed by that which is under it.

**A School of Electricity at Princeton.**

The new department of Electrical Engineering at Princeton University is to be opened next autumn, and examinations for admission thereto as well as for the regular classical and scientific departments will be held in the principal cities of the East and West during the latter part of June. Catalogues giving full particulars in regard to this new course are obtainable of the college registrar at Princeton, N. J.

It is of some interest to observe the number of prizes that are given in one of our larger universities during a college year. Ever since the establishment of the fellowship system at Princeton the numbers in attendance have increased and the standard of scholarship has been raised. There are the following fellowships open to competition by graduates of any university: Fellowship in Biology, which brings an income to the incumbent of \$400, Social Science Fellowship \$500, English Fellowship \$400, Archæological Fellowship \$400. The members of the senior class may compete for the following fellowships: Mental Science \$600, Experimental Science \$600, Mathematics \$600, Classics \$300, History \$250, Modern Languages \$250.

There are fifteen prizes offered during the senior year, eight in the junior year, three in the sophomore and one in the freshman year. Those who enter the freshman class next autumn will be eligible to compete in their sophomore year for the Steinecke prize for the best student in the classics. This prize of \$1,500 is the largest prize offered by any college in this country.

**Wilmerding, Pa., a Model Town.**

George Westinghouse, proprietor of the air brake patent, which made him wealthy and famous, proposes to build a town for his employes at Wilmerding, near Allegheny, Pa. He has bought 600 acres of land, and will spend \$3,000,000 in improving it. A new machine shop, costing \$1,000,000, will give employment to 5,000 hands, and turn out five times the work done at the present mills in Allegheny. The place is to be modeled after Pullman, Ill. There are 42 plots in the town site, each containing a number of lots. One of them will accommodate a fine hotel and a handsome club house, to be built together, and to form the most pretentious structure architecturally in the new city. Lots that are not taken by employes or others by a certain date will be built on by the company. About two hundred houses are now under way. The improvement company has bought 625 feet of frontage on the Monongahela River, near Fort Perry, to establish waterworks capable of supplying 20,000,000 gallons a day. Sewers are now being laid in every street, and natural gas will be used exclusively for fuel.—*Springfield Republican.*

It appears the first report of the time made by the new steamer City of Paris, on her first voyage to this city, namely, 7 d. 11 h. 33 m., was incorrect. It should be 6 d. 18 h. 53 m.