

## NEW BOOKS AND PUBLICATIONS.

CLASS BOOK OF CHEMISTRY; by Edward L. Youmans, M. D. Published by D. Appleton & Co., Broadway New York.

Dr. Youmans possesses the faculty of teaching chemistry in a clear and attractive manner. His "Class Book of Chemistry" was published ten years ago, but such has been the rapid strides made in chemical science recently, that it has been re-written, re-illustrated, much enlarged, and the new facts and principles bearing upon chemistry embodied in it. The old notion that the forces of nature are separate and peculiar forms of imponderable matter, has given way to the idea that they are closely allied and mutually convertible forms of activity or motion in ordinary matter. Professor Tyndall's volume on "Heat Considered as a Mode of Motion," noticed on page 146, current volume of the SCIENTIFIC AMERICAN, has dispelled the darkness which formerly enshrouded this subject, and the new views are illustrated and described in this volume. Spectrum analysis is also illustrated and described. This is another important discovery made since the "Class Book" was formerly published; and by this mode of investigation several new metals have been discovered, and the chemical composition of the sun himself has been ascertained. Dialysis—the important discovery of Professor Graham, made only a few years since—is also clearly explained; also the remarkable researches of Berthollet in synthetical chemistry, whereby the artificial production of organic substances has been achieved. Various other particulars of recent scientific progress, which have not yet found their way into text books of chemistry, are embodied in this, which is designed as an elementary manual for students, and a school text book; for which it is conveniently adapted, as it informs students how to make experiments themselves, and thus put in practice what they are taught. The following interesting extracts are condensed from it respecting organic synthesis:—

"An unexpected and remarkable advancement of organic synthesis has recently been made by Berthollet, of France. This chemist has devoted himself to the formation of organic substances, synthetically, by combining their elements through the aid of chemical forces only. He says:—'We have taken for a point of departure the simple bodies—carbon, oxygen, hydrogen and nitrogen, and have constructed, by combination of these elements, organic compounds, identical with the principles contained in living bodies. The substances that we first prepare by methods purely chemical on the principal carbides of hydrogen—the fundamental binary compounds of organic chemistry.' With oxide of carbon—a substance purely mineral—formic acid is produced, (the first organic compound) by the aid of pressure and in the presence of an alkali. This acid united to a mineral base produces a formate, which being decomposed by heat, the carbon and the hydrogen of water combine in a nascent state and produce carbides of hydrogen. From this marsh gas, olefiant gas and propylene, are produced, being the first step in synthesis. With marsh gas and oxygen, methylic alcohol is formed; and with olefiant gas and water, common alcohol is formed. Berthollet has converted propylene into glycerine—a proximate principle of fats; and glycerine has been transformed into one variety of sugar. What organic synthesis may yet achieve, it would be vain to speculate upon; but it is not among impossibilities that our sugar may yet be manufactured from coal."

THE ATLANTIC MONTHLY. Published by Ticknor & Fields, Boston, Mass.

The October number of this invaluable periodical is unusually interesting, and that is saying a great deal. The leading article is a continuation of Charles Lamb's uncollected writings, and deals tenderly with the great essayist's memory and genius. "My Palace," a lengthy poem, is rather mystified, and belongs to the "Light and Dark" school of poetry. The "Deacon's Holocaust" a tale is apparently one of a series in which the same characters appear in different scenes; the writer has a genial and sometimes stinging humor which he displays to much advantage, and the pictures of rural domestic life are faithful and pleasing. The "United States Armory" rather surprised us, for we failed to glean anything

new or of interest from it, except that which is already widely known to all well-informed persons. "A Letter to Thomas Carlyle," handles that satirist without gloves, if we may be allowed the phrase; but we do not imagine that he will be affected to tears by it. A man so far lost to courtesy and humanity as to insult a nation struggling for its existence by his "Iliad" will hardly be pierced in his thick moral cuticle by an essay in the shape of a letter, be it ever so well written and conceived. "Life without Principle," is a most excellent article, and one that men would do well to heed; we will thank the author, however, to be more circumspect in future, and consult us before publishing, as he has touched on a favorite hobby of our own. The poetry in this number is of unusual excellence.

## Mechanical and other Items of the War

THE "HOME."—It will be remembered that the Navy Department, with a thoughtfulness that was highly creditable to it, fitted out a small steamer called the *Home*, which was to be such in reality to the tired and over-worked officers on the iron-clads before Charleston. The steamer duly arrived at her destination, but she was found entirely unfit for the service proposed, and the excellent intention of the Navy Department was by no means carried out. She was immediately surveyed, condemned *in toto*, and sent to Port Royal, where she now lies for repairs sufficient to enable her to return to New York. It was a sore disappointment to the worn-out occupants of the damp, dark quarters of the monitors, but they preferred to remain where they were than go on board of her. She had no accommodation for officers, beyond her own complement, and "guests" on board the *Home* would have had to patronize the floor of the ward room, if they were sufficiently attracted by her name to remain on board over night. The same was the case with the men—her own crew needed all the space on her berth decks. But worst of all, she was without any proper outfit wherewith to entertain and comfort the men, who are so cheerfully enduring every discomfort and trial incident to monitors, and constantly exposed to the ocean swell, which keeps our decks wet all the time, and dismantled to "battle trim" week after week.

Somebody is to blame—who is it?

GOVERNMENT ARMS AND ORDNANCE.—In Providence, R. I., there are fifteen hundred and thirty-five persons employed on Government work. One establishment alone employs five hundred workmen on the Springfield rifled musket, and other factories are working with smaller forces on particular parts of the same favorite arm. An iron foundry employing one hundred hands is now casting ordnance comprising 11 and 13-inch Dahlgren guns, with shot and shell for the same. A gun is turned off once in four days, and five tons of shot and shell are cast per day. The wrought-iron Ericsson gun for the monster iron-clad *Dictator*, now building at New York, is to be bored and fitted for completion at this place. After it is bored it is to be brought to New York and completed, under the superintendence of Captain Ericsson, by putting on bands six inches in thickness.

The celebrated *Sumter*, alias *Gibraltar*, ran the blockade of Charleston on the morning of the 22d ult. She had on board two 600-pounders, and four 200-pounders.

[The "celebrated *Sumter*" was unfortunately sunk by Fort Moultrie (it is supposed) before she reached the city. About twenty persons were drowned out of a large number on board at the time.—Eds.]

Captain Ericsson has contracted to construct some 13-inch smooth-bore guns, which are to have a much greater initial velocity than any now in use. He is to receive nothing for these guns unless they burn over 50 pounds of powder—for every pound of powder beyond 50, Mr. Ericsson is to receive \$5,000. He is confident of being able to burn 100 pounds, and is certain of burning 75 pounds. The solid shot will weigh 220 pounds.

The new gunboat *Ozark* had a trial trip on the Mississippi, on Sept. 18. The naval inspectors pronounced the performance satisfactory. She is armed with two 11-inch guns in a revolving turret.

A large 15-inch gun was recently sent out to New Orleans on the steamship *McClellan*. The weight of the gun is very nearly 19 tons.

## MISCELLANEOUS SUMMARY.

EXPLODING GUN COTTON ACCIDENTALLY.—The following is the opinion of Dr. Phipson, given in a recent number of the *Moniteur de la Photographie*, Paris:—"It may perhaps be remembered that Mr. Dornbach, a young artist photographer, of America, met his death by the explosion of some gun-cotton he was packing in a cask, making use of a stick to force it down. It is questioned whether the explosion was caused by electricity or by friction; but the high temperature required to inflame gun-cotton may lead us to doubt whether the friction of the stick against the sides of the cask would evolve sufficient heat, although we cannot undertake to say it would be impossible. Dry gun-cotton is a highly electrical substance, developing a great quantity of resinous electricity by friction, and it is highly probable that in the operation which cost Mr. Dornbach his life an electrical spark inflamed the mass."

ACTING ENGINEERS IN THE NAVY.—A recent order says:—"The attention of the Department has been called to 'the almost universal complaint of defects in machinery and boilers of vessels' returning from cruises, and to the 'negligence on the part of engineers in not repairing the defects as they occur, but waiting until they arrive in port, when everything is to be done by mechanics from the Navy Yards.'"

"Engineers will hereafter understand that the condition of the machinery under their charge, on the arrival of the vessel from a cruise, will be considered as a test of their efficiency and fidelity in the discharge of their duties; and that the result of the examination then made, will determine whether they have discharged their duties in such a manner as to deserve commendation, or have been so grossly negligent or incompetent as to render their expulsion from the service an act of justice to the public."

GIDEON WELLES, Secretary of the Navy.

CHICAGO WOOD PAVEMENTS.—The Board of Works in the city of Chicago have given the preference to wood pavements over those of stone, as being the most durable of any kind yet used there. The following is a description of the method of construction:—Lay down flooring of 1-inch board on a bed of sand; coat the floor with asphaltum; stand on end blocks of wood 6 inches high, by 3 inches thick and 9 inches in length, in rows about 1 inch apart, divided by strips of board. Fill in these open narrow spaces with asphaltum and pebbles, and then cover the whole with asphaltum. There are six miles of these pavements in Chicago, which after six years constant wear, are found to be nearly as perfect as when laid down.

PORT ROYAL MECHANICS.—A writer in "Harper's Magazine" says of the mechanics employed by Government at Port Royal, that they are the slowest and the laziest set he ever saw. He says they come to work at nine in the morning, and go home at three in the afternoon, taking the usual hour for dinner *ad interim*. For this exhausting labor they receive \$3 per day and rations; one of them was detected asleep at 10 o'clock A. M. This, if true, is rather a damaging record, and if the acting engineers depend on these gentry to overhaul their machinery, they will be slightly delayed.

THE REBEL RAMS.—From the tenor of recent dispatches there is but little question that the rams building in England for the rebels will soon leave for this country. They are preparing for a trial trip, and as the builders say that they have received no official intimation from Earl Russell that they are to be detained, it is not at all doubtful what course will be pursued. A large number of sailors from the *Florida*, now lying at a French port, have arrived in Liverpool to man the ram nearly ready for sea.

A REBEL "gunboat" (without any guns) was recently captured by the *Jessup* in the Pamunkey river. This craft was a common row boat 40 feet long, and had a small engine of about one calf power in the stern. She was used for towing vessels loaded with grain, and it is said made very good time.

The *Galena* has been converted from an iron-clad to a gunboat. She has been placed on the dry docks in the Philadelphia Navy Yard to have her hull overhauled and coppered.