

MR. RUGGLES AT NEW HAVEN.

On the 27th of July a semi-centennial address was delivered before the alumni of Yale College, by Samuel B. Ruggles, LL.D., and it has been published by D. Appleton & Co. in a neat pamphlet. We find it filled with interesting statements, some of which we extract:—

THE PTOLEMAIC THEORY ONCE TAUGHT AT YALE.

The fact is strange and curious, that even here in emancipated America, the Ptolemaic or geocentric theory, enforced by Papal assumption on the dark ages, was actually taught for several years, within these very walls. It was not until 1718, that the light of the heliocentric system was first let in, through the efforts of the clear-sighted Doctor Samuel Johnson, then a tutor in the College, and who in due season would have become its President, but for his ill-timed doubts of the validity of Presbyterian ordination. A copy of the "Principia," sent out from Europe, had reached the little college library, upon which the youthful Johnson entered with great avidity, after studying the higher mathematics for the purpose. "Till then," says his biographer, "the Ptolemaic system of the world was as strongly believed as the Holy Scriptures; but Johnson was soon able to overthrow it, and establish on its ruins the doctrine of Copernicus." The heliocentric system at once illuminated the College, and here it will continue to pour forth its magnificent light until the College, and the earth, and the sun, and the stars, shall be no more. Poor old Copernicus, who in his dying hours had sought, by a letter of dedication, to disarm the opposition of the Pope, was lying in his grave on the Baltic, carefully covered by the Papal excommunication, which was not formally annulled by the Vatican until the year 1821, seven years after our class left college. Since that time, the Church of Rome, claiming to be the chosen keeper and interpreter of Holy Writ, together with the residue of the Christian world, have permitted the students of the Pentateuch to read the Genesis by the light of Copernicus and Newton.

THE FIRST NOTIONS OF GEOLOGY.

In 1814 we left these walls under the belief that the world was just 5,818 years of age, and no more. In 1810, when we entered the College, Benjamin Silliman was in the early bloom of that noble manhood which has since borne fruits of such surpassing excellence. He had but recently returned from Europe, where he had gone to study with the ablest masters, the structure and history of the earth. The field was new and nearly untrodden; but in Edinburgh he had come in contact with fellow laborers, whose vigorous genius was grappling in the early morning light, with a gigantic cosmogony, just becoming dimly visible. The investigation required, at the threshold, a calm and careful inquiry, whether the "days" of the Genesis, as recorded by Moses, were necessarily limited to six diurnal revolutions of the earth on its axis, or could be fairly enlarged to embrace six great cosmical intervals of time. A devout Christian inquirer, like Silliman, immovably convinced of the truth of the Holy Scriptures, could not and would not decide such a question without long and conscientious study, and above all, the fullest examination of the facts.

I have already ventured to assert that in every wisely managed college, science and theology will be blended in due proportion, and that in this respect, the authorities of Yale have been singularly successful. The labors of Silliman, so far from weakening, have materially strengthened our faith in the inspiration of the Mosaic record. The flood of light which geology has shed on the cosmical "days" of the Genesis, has immeasurably widened the basis of our belief. By removing in all rational minds every apparent antagonism between Science and the Bible, it has practically established a *Concordat* with all the churches, reverently assigning to theology all the spiritual portion of man's complex nature, and committing to science only the lower and inferior office of discovering and declaring the physical laws and history of the material universe which he temporarily inhabits. So lively, however, is the perception of the comparative progress of the geological eras thus established, that Dana, in his admirable and exhaustive "Manual of Geology," complains, with some-

what of American impatience, that "the earth dragged slowly through its early stages!"

NAPOLEON'S WORKS.

We began to perceive that, after all, the imperious but imperial Ruler had done some little good to France, and perhaps to the world, particularly in his civic administration in simplifying the law, introducing sound finance with a metallic basis, promoting scientific discovery, and eminently in the great public works, by which he strengthened and adorned his Empire. On the other hand, we discovered that some of the restored monarchs, in their exile, "had forgotten nothing and had learned nothing," but to do nothing for the general advancement of civilization and the good of man.

We may take, as a specimen, the immediate suppression in every part of Italy, by the dozens of fugitive princes, emerging from their hiding places, of the splendid "Metric System," which had been introduced by Napoleon, and was in general use throughout the Italian Peninsula; and the sudden resurrection, from all its nooks and corners, of the obsolete, worm-eaten, and widely varying weights and measures of the *ancien regime*,—not to mention the ridiculous restoration of the knee-breeches and wigs, and especially the *queues*, from which attenuated "caudal" appendage the reactionary party in Italy derived their diminutive or *sobriquet* of "codini." The English Tories may have dropped the *queues*, but they even yet retain much of the genuine spirit of the "codini;" for as late as the present year 1864, they resisted, in Parliament, the passage of a bill merely permitting the "Metric System" to be used in the United Kingdom; and expressly on the ground that it was the offspring of the French Revolution. The International Statistical Congress at Berlin, in September, 1863, unanimously passed a resolution in which the delegate from the United States actively concurred, recommending to the "Inspectors of Schools," of the various nations of the civilized world, to introduce the study of the "Metric System" in all schools subject to their authority. The schools of the United States, being subject exclusively to the government of the separate States their separate action is necessary. The Legislature of Connecticut, in June, 1864, passed a resolution, introducing the study into all her schools. Between the years 1842 and 1860, Sardinia, in her career of reform, had gradually retraced her steps; so that the "Metric System" is now legally re-established in every part of Italy, except Rome and Venice.

CONCLUSION.

Let us not forget, that of this bright and rapidly coming future, even we, of the time-worn class of 1814, are still a part; that our race is not fully run, and that much may remain even yet for us to do. While we mourn the cruel and unmerited sufferings of loyal men and of loyal women, both in the North and in the South, let us exert, to the last and to the uttermost, every faculty of our nature, to uphold that glorious Union committed to our keeping by our honored fathers, with the solemn and undying conviction that the tranquility and happiness of a continent, not for a day, but for centuries to come, are staked upon the pending conflict.

Above all, let us ever devoutly trust to the wise and comprehensive Providence of God, and always bear in mind, that in the inevitable logic of events, guided by His superintending hand, every present evil contains, within itself, the germ of great and lasting good. If history be philosophy teaching by example, let us reflect, that two centuries ago, the awful fire of London drove out the plague forever; that even in our day, the dark and dingy lanes of Hamburg, abandoned to the flames, gave birth to a new, and powerful, and brilliant city; and that the continental Republic of the western world, chastened by adversity, and purified by fire from blot or stain, may soon be found calmly but proudly resuming its accustomed march, advancing with firm and unbroken step, onward and upward into the coming ages.

A REDUCTION has been made in the cost of telegrams in Paris. A message can now be sent to any part of Paris for fifty centimes (10 cents) and the administration guarantees that it shall be delivered within half an hour from the time it is dispatched.

Pittsburgh Cast-steel Works.

The Boston *Commercial Bulletin* gives an account of a visit to the cast steel manufactory of Hussey, Wells & Co., at Pittsburg, from which we take the following extracts:—

"From twelve small furnaces in 1859, with about twenty-five men, the Hussey, Wells & Co.'s works have increased to ninety furnaces now in full operation, which, with thirty more that are nearly ready to start, will make one hundred and twenty melting furnaces, while the force of operatives is increased to about three hundred. An idea of the enormous expense of running these great establishments may be obtained from the fact, that this one consumes about one hundred and forty tons of coal a day, and in full operation consumes two hundred and forty crucibles a day, each crucible costing at present prices four dollars each, the total daily expense for these crucibles alone foots up the pleasant little sum of nine hundred and sixty dollars.

"Although Messrs. Hussey, Wells & Co., are not the first who commenced the manufacture of steel in this country, they are, we understand, the first that have succeeded in making the finer qualities of cast steel, such as is used for edge tools, drills, etc., and in this theirs may be denominated the pioneer establishment of this country. They have supplied New England with a large portion of the steel used here for the manufacture of cutlery for nearly three years past, and the Cliff, North Cliff, Northwestern, Pontiac, Bay State, and other Lake Superior copper mines with drills and other mining tools; also the Denver and Colorado mines. The plow and axe manufacturers draw on them for their material, and D. Magdoll & Co.'s Hammer Works, the largest in the country, at Norwich, N. Y., puts the Hussey & Wells steel into his nail drivers; the Ames Manufacturing Company, at Chicopee, and other sabre and sword factories, also make their drafts on this establishment for the material for making those cutting arguments against the enemies of the Union, and aver that in this American steel there is far less breakage, and it does not crack like other kinds. Railroad men commend the locomotive cast steel springs as the best they have ever used, and less likely to break or 'lose their set' than any other.

"This American cast steel is declared by all edge tool manufacturers, machinists, plow-makers, hammer-makers, sword-makers, railroad men, miners, and in fact all who make and use articles requiring the finer qualities of cast steel to be far superior to the best English steel. This has been decided after the most thorough and severe tests, and is now a fact generally acknowledged. So in this instance, at least, we may hurrah for American manufactures which shall beat the world ere long, and if our Congress will but make the tariff high enough we shall soon be able to introduce a competition among our own steel manufacturers so that consumers will obtain their supplies here and not go abroad for them, the only importations to be that of the skilled laborers and artisans who shall come here for the better returns and advantages to be obtained for their labor. These works when fully completed this fall, will turn out twenty tons of cast steel a day, a larger amount, we think, than can be produced by any other establishment in the country."

The Age of the Tides.

After the reading of a paper on the tides, before the British Association at its recent meeting, Professor Rankine said that it was perfectly well known that water moved miles horizontally, while it moved only a few feet vertically. If earth was covered with an ocean of a uniform depth, the tides could be easily calculated in a mathematical way, but the irregularity of the depths of the sea, and the shape of the continents, made it complicated. This was so important that gentlemen who were employed in such investigations would do well to give their minds so as to devise some means of recording horizontally, as well vertically, the motion of the water.

Mr. Markes said that there was one very curious thing in connection with diurnal tides. The tides, as they were aware, were one and a half to two days' old according to the coast. At Bombay they were one and a half days' old; that was the semi-diurnal tide. But the diurnal tide was not more than a few hours old. Tides of a longer period were much more accelerated by friction than tides of a shorter period.

Improved Grain Dryer.

The chances of trade and the processes of nature, cause grain to sweat and ferment when stored in large quantities, unless it is properly dried. To effect this it is necessary to subject the staple to a gentle heat so as to drive off the moisture contained in it.

The engraving published herewith represents an improved grain-drying kiln which is constructed as follows:—The grain is placed upon the trays, A, which consist of separate leaves, swung by separate rods from the main rod, B. These trays are so swung that the weight of the grain will preponderate on the upper edge, C, and thus cause all the trays to close on each other automatically. When the grain is on these trays a current of heated air ascends from the furnace, D, through the flues, E, and the passages, F, to them. The flue, G, runs cross-ways of the kiln, and there is a valve, H, in each passage, by which the heat under any of the trays may be cut-off.

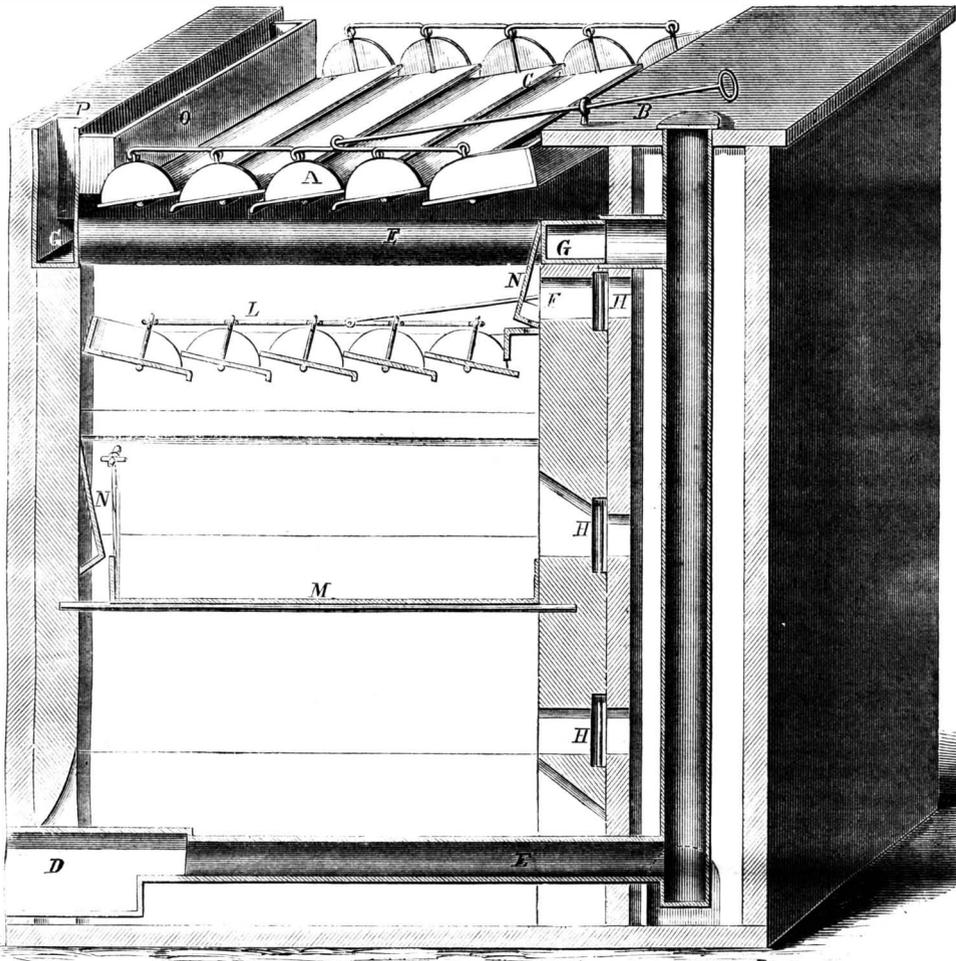
When the grain has been sufficiently dried on trays it is dumped from them, by moving the main rod, B, on the second series, L, and a fresh charge laid on the first ones just emptied. From the second pans the grain is again dumped at the proper time on to the platform, M, which is one continuous floor, where the drying is finally completed; thus three charges are drying at once; suitable deflectors, N, guide the grain in its passage from the trays to the lower platform. There are strips of metal, O, at the ends of the upper trays, which prevent the grain from sliding off there. All the flues communicate with the discharge flue, P. The bottoms of the trays may be perforated if desirable, so as to allow the heated air to pass through, and it is intended in practice to use superheated steam on the upper trays, leaving the floor to be acted on by hot air. The steam pipe will pass up the main flue and through the passage, F. The tops of the trays will then be covered steam-tight, with an escape-pipe and damper fixed in the cover instead of being left open, as shown. The inventor says that wet wheat dried in his machine weighed 50 pounds to the bushel against 45 pounds to the bushel dried in another kiln, both lots being from the same cargo, and having been wet the same length of time. The increase of weight he attributes to the action of the superheated steam, "for as the steam rises from the lower floors it is superheated in its passage, and ascends to the upper trays where it is absorbed, and, as a consequence, the grain retains more substance than where the steam passes directly out."

With this machine one man is capable of drying from 10 to 5,000 bushels per hour, according to the capacity of the dryer. The quantity of fuel is one cord of wood to one thousand bushels of grain, which may be reduced where a steam engine is used, as the heated air from the boiler can be turned to advantage. This is a convenient and well-arranged machine, and will doubtless give good results when properly managed. It was patented on the 13th of September, 1864, through the Scientific American Patent Agency, by John Babillion, of Detroit, Mich., from whom all further information can be had. The entire right is for sale.

The Berkshire Woolen Co., at Great Barrington, are manufacturing some cloth for A. T. Stewart, of New York, at the rate of \$11 a yard.

A NEW PHRENOLOGICAL BUST.

The attitude of the world of Science toward the parvenue, phrenology, still continues one of doubt. "We do not yet know whether the new comer is a rocket, shooting a few yards into the atmosphere, or a star, kindled and set forever in the depths of the firmament." There is, however, a growing disposition to recognise a correspondence between the general form of the head and the general cast of the character. It is admitted that no cases can be found of decidedly superior intellect accompanied by very

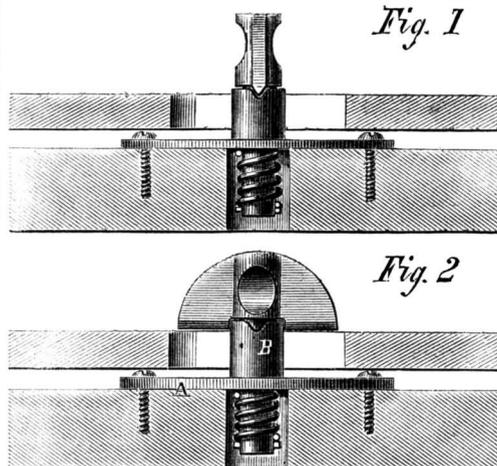
**BABILLION'S GRAIN DRYER.**

small frontal portion of the brain; or the manifestation of gross animal passions with a small development of basilar region of brain.

Messrs. Fowler & Wells, 389 Broadway have just put in market a phrenological bust well adapted to the position which phrenology occupies. One half of the head is marked off with the organs in the usual way, while the other half is marked only with the general divisions, moral sentiments, intellectual faculties, etc.

REED AND PACKARD'S SPRING-CATCH BUTTON

When a shower comes up an open carriage is an unpleasant vehicle to be caught in. There is hurry-



ing to and fro on the part of the occupants to get the top up and the side curtains down, and before this is done one is likely to get wet to the skin. The curtains can't be buttoned over the studs, and time and

temper are alike wasted. With this simple button the task may be accomplished with great ease. In Fig. 2 it is shown broadside to, or in, the position when the curtain slips over it. By simply turning it across, as in Fig. 1, the curtain is secured much better and quicker than with the old-fashioned arrangement. There is a small spring below the plate, A, which is let into the bow, or other part of the vehicle, and a notch in the tube, B; a projection fits into this notch and holds the button in position, open or closed as desired. This button was patented on Aug. 23, 1864, by T. K. Reed and H. F. Packard; for further information address the inventors, Reed & Packard, North Bridgewater, Mass.

Wrought-iron Rifled Guns.

The United States Government has sent several experienced officers of the army to test the Ames wrought-iron gun. The test requires one thousand shots to be fired from the gun. The test is taking place at Bridgeport, Conn., and thus far one hundred shots have been fired; it shows that, with twenty pounds of powder and fifteen degrees elevation the gun throws a shot four miles. It yet remains to try the full charge of 25 pounds, which, with a greater elevation, may be expected to realize the seven miles range attained in the private trial made a few weeks ago. These guns are molded solid throughout. The section around the bore is molded first, and by each subsequent heat the molds are extended outward. Each section is composed of three rings; the first has a diameter of ten inches,

with a hole in the center. This ring is accurately turned to fit inside of a second, which is also turned to fit the third and outside ring, each course being six inches thick. This furnishes not only purity in the metal, but the most perfect solidity throughout the entire mass. The hole at the center permits the impurities of the metal to be worked out from the inner rings, while being heated and hammered, while the scales which may accumulate on the outer rings are permitted to fall outward as the weld extends toward the circumference.

To Remove Silver Stains.

In the *Photographischer Archiver*, M. Obernetter recommends a concentrated solution of perchloride of iron as a detergent for silver stains on the hands or clothes. If gallic or pyrogallic acid has been used it will be necessary to wash the spot afterward with a few drops of a strong solution of oxalic acid. A weak solution of this salt is also useful for diminishing the intensity of negatives to be copied in the solar camera. Weak negatives may be transformed into strong ones by using first a solution of chloride of iron, and secondly with pyrogallic acid and nitrate of silver.

TWENTY-FIVE DOLLARS A BUSHEL.—Among the pears exhibited at the recent fair of the Horticultural Society of the American Institute was one bushel of Duchesse d'Angouleme, which was sold after the fair for \$25. There were 61 pears in the bushel; they, therefore, brought 41 cents apiece.

THERE are now building for the through broad-gauge routes from New York to St. Louis (1,200 miles) one hundred and fifty locomotives, five thousand freight cars, and elegant passenger cars in proportion.