

naval officer will admit that the old wooden line-of-battle ships of the Trafalgar and Wellington class would have silenced the forts in an hour with little damage to themselves. If the Egyptian shells had been charged with dynamite, all would have been changed."

Thus it would appear that the modern fleet has not fulfilled its promise, while the dynamite principle, as applied to projectiles—a principle, be it said, which so far has seen its highest development in America—is commended by the most distinguished authorities, among them the chief officer of our navy. That being the case, it would seem as though we could not have been idle to more advantage in the one direction or used our energies to better purpose in the other.

For further proof of this, we may turn to the Admiral's paper. He finds reason to believe that two or three small crafts armed with long range dynamite shell guns would be more than a match for the most powerful armorclad ship afloat. There's the Graydon gun, which the Admiral recommends so highly. How would one of these great ships fare if opposed to it? At a recent experiment with a 7 inch Ames wrought iron muzzle-loading rifle weighing 23,000 lb., powder 23 lb., a projectile weighing 122 lb. charged with $2\frac{3}{4}$ lb. dynamite was fired at a 7 inch iron turret; the explosion of contact lifting the turret, weighing 30,900 lb., and carrying it 25 feet by actual measurement, the plates being torn violently apart.

The Zalinski gun is yet, in the opinion of the Admiral, of insufficient range, but he believes it will yet become another important factor in naval war.

From all this it is seen that, however unwise the policy of waiting may be when regarded as an abstract proposition, its adoption, at least in the present case, would seem to have been fortunate. At the breaking out of the civil war in 1861, the effective power of our fleet was small. In four years' time it was the most powerful in the world, even the British steam fleet, only a few years before acknowledged to be the best equipped on the ocean, being compelled to take second place because of the introduction of naval armor of Yankee designing.

PROPOSED INCREASE OF THE BRITISH NAVY.

The intentions of the English government with regard to the navy have recently been formulated by the First Lord of the Admiralty before Parliament. It is proposed to build eight first-class men-of-war, of 14,000 tons each, and two of 9,000 tons, besides nine first-class cruisers and twenty-nine smaller vessels. A total tonnage of 318,000 is represented, and a cost of about one hundred millions of dollars is predicated. Four and a half years are allowed for carrying out the programme. The work, it is proposed, shall be divided between the government ship yards and private firms. The recent accessions to the navy of France and of America are probably among the incentives to this action. Formerly the United States, by their isolated position, felt to a considerable extent exempt from the necessity of entering into competition with other powers in the matter of armament. It is to be hoped that a race for nominal supremacy on the sea shall not be participated in by this country. The construction and maintenance of useless ironclads is only a degree removed from the almost intolerable burden of a standing army. It is really to be hoped that the improvement of ordnance will make these expensive and useless ships as extinct in naval warfare as personal armor is in land fighting. Then passenger ships could be pressed into service if needed. Apart from this, the proposal is a very impressive one. The ships will compare in tonnage with the Great Eastern, and will be the precursors of fleets that will dwarf all existing craft from their number and weight. This is certain to ensue, because the other great nations will follow in the lead of England. Yet the hope is expressed by the government that other powers will not attempt to rival England, as she has not attempted to rival them in her land forces. This reads like an apology for so immense a demand, but it is to be feared that the Continental powers will not see it in that light. If carried out, it probably will mean increased expenditure of national revenues by all nations, so that England's hundred millions will be but a fraction of the useless expense that will be lavished on the world's destructive navies.

A RIVAL FOR JUTE.

One of the characteristic features of the industrial discoveries and inventions of the day is the development of new fibers. Jute, for many years, has held a prominent place, and has acquired such importance that it has come to be looked upon as a necessity. A combination of manufacturers and dealers have, to a great extent, controlled the market, but now it is said that the pine needle has proved sharp enough to prick some very serious holes in the trust. Unquestionably the pine needles contain a fiber, but the problem of economically extracting it without impairing its length or tenacity was hard to solve. A typical patent is one granted to William Latimer, of Wilmington, N. C. He proposes to utilize the fiber principally for the manufacture of bags for inclosing cotton bales. As a

material for the latter purpose, jute has long reigned supreme. The treatment of the "needles" is a simple one. The outer coating of the leaves is silicious in composition, while the inner parts are resinous and pulpy. Hence Mr. Latimer proposes to energetically attack and destroy the outer coating first, and then to apply a more moderate treatment to the easily disposed of chlorophyll and resin of the inner portions of the leaf.

The needles, preferably green, are placed in a tank, and are pressed down by a grating and screw against its bottom, so as to be tightly compacted. A solution of caustic soda of three per cent or four per cent strength is then introduced, until the mass is about covered. Steam is then turned on, and the temperature kept at 212 degrees Fahrenheit for ten or fifteen minutes. A head of foam forms on the solution, which is accepted as the index of the completion of the first step. The screw is now loosened, and the solution, which contains considerable silicate of soda, is allowed to act upon the leaves for about ten hours, the temperature varying from 208 deg. to 70 deg. Fahr. The gummy and resinous matters are saponified, and the fiber is left uninjured as regards length of staple or tenacity. The soda solution is run off, and the fibers are washed repeatedly with clear water at various degrees of heat. After this the fiber is ready for mechanical treatment by regular processes. In the successive washings the temperature is reduced step by step, but never is allowed to fall below 70 degrees Fahrenheit. This is thought to favor the production of a clean fiber.

It is interesting to think that in her pine forests the South has ever growing the fiber for her cotton bales, and we hope the process may attain a wide application.

THE CELESTIAL WORLD.

THE OCCULTATION OF JUPITER.

There will be an occultation of Jupiter by the moon on the morning of the 24th. The occultation will be visible in Washington, though the sunlight will greatly interfere with the observation. The immersion of the planet takes place at 6 h. 42 A. M., and the emersion takes place at 7 h. 43 m. A. M. in standard time at Washington. The occultation continues 1 h. 1 m. The sun rises on the 24th at 5 h. 42 m. A. M., and the occultation commences an hour after sunrise.

The moon at that time has just entered upon her last quarter, and is near the meridian. She may be easily found as a half moon, taking on the cloud-like aspect that marks her appearance in daylight. Jupiter is now bright enough to be seen with the naked eye in full sunlight, but it is a difficult matter to find him, and requires exceptional visual power. Keen-eyed observers may succeed in picking him up as a cloudy point a little further south than the moon, if they begin to look a short time before the occultation. They will see him apparently approach the moon, disappear behind her bright limb, and reappear after an hour's absence, from behind her dark limb, or where it would be, if it were not hidden in the sunshine.

The time and continuance of the occultation are given for Washington. They will differ in other localities where the phenomenon occurs, on account of the parallax of the moon. In Providence, R. I., the immersion of the planet takes place at 6 h. 55 m. A. M., and the emersion takes place at 7 h. 50 m. A. M., standard time, the occultation continuing 55 m. The difference is due to the different direction of the moon when seen from two different points like Washington and Providence.

An occultation of Jupiter is a sight worth seeing, even in the daytime. It is infinitely more interesting if it occurs when the sun is below the horizon, and can be observed in a powerful telescope. If the moon be then passing from the full to new, the Prince of Planets, nearly as large as the moon to the unaided eye, seems to plunge headlong beneath the moon's bright limb, and reappear when the occultation is over beyond the moon's dark limb with the suddenness of a new creation starting from the sky depths. An opera glass will be a valuable aid to observers of the occultation of the 24th, and a telescope will bring out the picture with marvelous effect.

Jupiter is occulted nine times during the year, but only two of the occultations are visible at Washington—one on the 24th and the other on September 3.

Observers should prepare themselves for the occultation by a view of the charming morning star and the moon before the dawn in the southeast, in order to fix in the mind their relative position and place in the heavens.

How Many Minutes Have Passed at the End of the Year 1888, Calculating from the Beginning of the Christian Era?

This question has recently been answered in an interesting article published in a German journal, the *Munich Neueste Nachrichten*, with the surprising result that not a milliard minutes have passed. The calculation is as follows: 1888 multiplied by 365 days equals 689,120 days, to which must be added 460 leap days, making a total of 689,580 days, which contain

16,549,920 hours, or 992,995,200 minutes, that is 7,004,800 minutes less than a milliard.

The milliard minutes will be reached in the year 1902, on the 25th of April, at 10:40 A. M.

Taking in consideration that the indemnity paid by France to Germany after the war of 1870-71 amounted to 5 milliard francs, it follows that if this sum were to be paid at the rate of 5 francs (about \$1.00) for every minute since the beginning of the Christian era up to date, that sum would not have been paid yet at the present time.—T. G. H.

Newspaper Notes.

Mr. Moses Y. Beach, of this city, has lately become the editor and proprietor of the Berkshire County *Eagle*, published at Pittsfield, Mass. Mr. Beach is a grandson of the late Moses Y. Beach, formerly of Springfield, Mass., afterward widely known as the enterprising proprietor of the New York *Sun*.

Mr. Beach, of the *Eagle*, is a native of Connecticut. Although quite a young man, he has had much newspaper experience, having served several years on the *Graphic* and other papers, and for the past six years on the New York *Tribune*. He "can boast of a high ancestral name," being a lineal descendant of Elder William Brewster, who came over in the Mayflower, and of Elihu Yale, founder of Yale University.

The *Eagle* is one of the ablest newspapers in Western Massachusetts, and perhaps the oldest. It was established in 1789, one hundred years ago, the year Washington became President.

The first newspaper in America was the Boston *News Letter*, which was first issued by John Campbell on Monday, April 24, 1704; it was regularly published for nearly seventy-two years. The second was the Boston *Gazette*, begun December 21, 1719. The third was the *American Weekly Mercury*, issued in Philadelphia on December 22, 1719. James Franklin, an elder brother of Benjamin, established the New England *Courant*, August 17, 1721.

The first steam printing press for newspapers was that used on the *London Times*, November 28, 1814.

Sir William Pearce.

The recent death of Sir William Pearce, in his 56th year, arrests in his career one of the most eminent engineers of naval constructions of our epoch. Sir William was born at Brompton, England, on the 8th of January, 1833. After his studies at the government school at Chatham, he was, although still a young man, selected by the Admiralty to superintend the construction of the Achilles, the first iron ship built at the government dockyards.

Later on he assumed the direction of the Napier dockyards, on the Clyde, where he obtained a brilliant renown. A few years afterward (in 1870) he took possession of an important station at Fairfield, where, in concert with the near relatives of Mr. John Elder, he continued and developed the famous house of John Elder & Co., of which he became the head in 1878.

It was at this epoch that he conceived those grand plans for the construction of packets with which his name has remained associated.

Under his direct supervision, there were constructed in his shipyards a number of vessels of more than 200,000 tons burden, and of nearly 300,000 H. P., for a sum exceeding \$35,000,000.

The first of the series of transatlantic vessels was the Arizona, built for the Guion line. This was followed by the Alaska and the Oregon, whose speed was exceeded only by that of the Umbria, which, with a few important modifications, was of the same model.

Nearly at the same epoch he built the North German Lloyd's fleet, consisting of ten magnificent packets. Afterward came the New Zealand Shipping Company's fleet, whose success is well known, and which reduced the distance of the antipodes to 36 days from England, and of Sydney to 38 days from Plymouth.

In the construction of vessels of less size than those cited above, Sir William was no less successful. It is, in fact, due to him that the passage from Dover to Calais can be, for the first time, effected in less than an hour.

His great technical knowledge, activity, and remarkable energy, and his ability to distinguish capable men, permitted him to establish the vastest shipyards in the world.

The extraordinary rapidity with which he built a 5,000 ton steamer—in the incredible space of 98 days—will long be remembered.

It was likewise due to his great energy and to the remarkable organization of his establishments that, at the time of the Soudan war, he built, in 28 days, 11 stern-wheel vessels for the navigation of the Nile, and that he was enabled to deliver them at Alexandria two days before the expiration of the contract. It was for the same destination, too, that he constructed a hospital boat in the space of 21 days—a feat that procured for him the earnest felicitations and thanks of Lord Hartington, then minister of war.

Sir William was elected a member of Parliament in 1885, and was made a baronet in 1887.