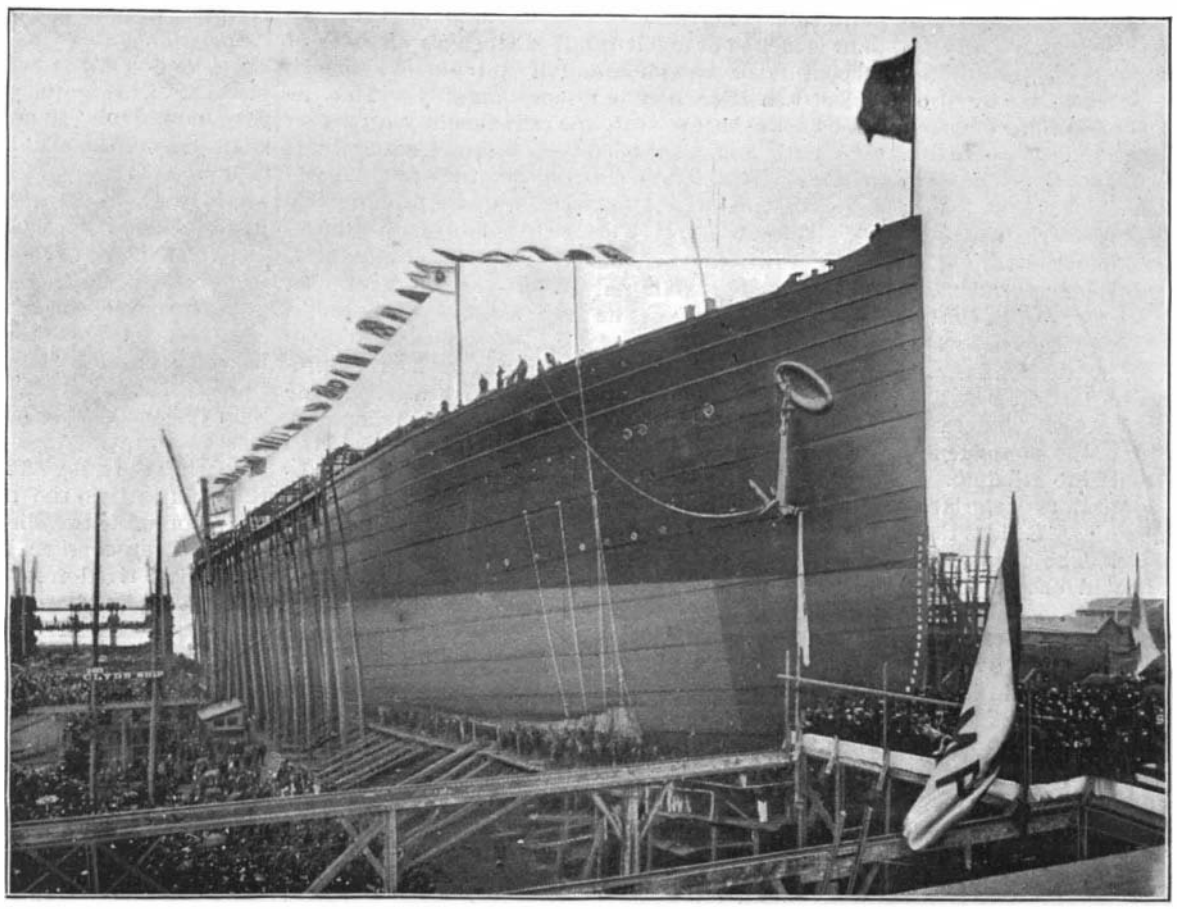
THE NEW AMERICAN STEAMER ST. PAUL.

No more successful launching of a large vessel was ever effected than was that of the new American liner St. Paul, from the Cramps' shipyard, at Philadelphia, April 10. This was especially gratifying because of the failure to effect the launch some two weeks ago, as was first intended, causing great disappointment to a great crowd which had then assembled to do honor to the occasion. The first failure was attributed to the poor tallow, but there was no fault of this kind the second time, and the tallow was mixed with lard oil and steamed just before the launch. It has been asserted that the vessel was heavier the first time than she should have been, but this was effectually answered by the fact that the builders continued to put in weight instead of taking it out.

Up near the bow one side of the cradle had sunk two inches, two weeks ago, under the pressure of the jack screws, and the ways were shaped to allow for this settling. It was intended the launch should take place at 2:30 p. m., but a freshet in the Delaware brought high water earlier, and at 12:15 p. m. was heard the "rally" of the four hundred men who had been told off as wedgers, as they lifted the vessel from the keel blocks by pushing up the launching ways against her. In five minutes more the men were heard cutting away the keel blocks, and soon the vessel commenced to glide down the ways, keeping the same pace nearly all the way. As she started the usual christening bottle was broken on her bow by Miss Frances C. Griscom, a sixteen year old daughter of President Griscom, of the International Navigation Company. The vessel was towed back to the yard within twenty minutes.

The St. Paul is a sister ship of the St. Louis, launched in November last, and both are, in the words of Mr. Charles H. Cramp, "American from truck to keelson. No foreign materials enter into their construction. They are of American model and design, American material, and built by American skill and muscle."



THE ST. PAUL READY FOR LAUNCHING.

They are the largest vessels ever constructed in America, their principal dimensions being: Length over all, 554 feet; length on load water line, 536 feet; extreme breadth, 63 feet; moulded depth, 42 feet; tonnage, gross register, 11,000 tons. The hull has a double bottom constructed on the cellular principle, subdivided by athwartship bulkheads and a longitudinal division arranged for heeling purposes, the whole available for water ballast. It is so subdivided by transverse bulkheads that even in the event of a collision and injury to a bulkhead, whereby two compartments might fill with water, the ship would still float in perfect safety. It has a straight stem and elliptical stern, topgallant forecastle and poop, with close bulwarks fore and aft, and promenade, saloon, upper, main and orlop decks, the three first named to be plated from end to end. The main deck will be plated for the length of the machinery spaces, and will have stringers and tie plates beyond. Wood planking will be laid on all decks. The promenade deck will remain unbroken the whole length of the vessel. The vessel will carry about 320 first-class and 200 second-class passengers and 900 emigrants.

The engines are quadruple expansion, designed to develop 10,000 I.H.P. each. The cylinders are 36, 50, 71, and 100 inches respectively in diameter, with a piston stroke of 60 inches, two sets of engines turning twin screws, which will be sectional, with three blades. Steam for the working of the main engines will be furnished at about 200 pounds pressure by six steel double-ended boilers, each 20 feet long and 15 feet 7½ inches diameter. To comply with the terms of the contract, the builders will have to show, by an extended sea trial, that when working under ordinary sea-going conditions the vessel is easily capable of maintaining a speed of 20 knots per hour at sea.

The St. Paul, as well as the St. Louis (described in the SCIENTIFIC AMERICAN, August 11 and November 24, 1894), has been especially arranged to be readily and quickly convertible into an armed cruiser of the United States government, in which capacity she will carry a number of six-inch rapid fire guns.

LAUNCH OF THE NEW AMERICAN LINER ST. PAUL, AT PHILADELPHIA, APRIL 10. PHOTO BY W. H. RAU.

The Wisconsin Dairy School.

The Wisconsin Dairy School is one of the most successful institutions of its kind in America. The novelty of its purpose and its unusual methods and equipment make it very curious and interesting. The institution offers courses of study in the theory of dairying, besides being equipped to give practical instruction in all kinds of dairy work. The school is sustained at great expense, but it is believed that the outlay is justified by the advantages resulting to the dairy interests of the State.

The school is planned to accommodate one hundred students, besides those taking courses in farm dairying. The course of study covers a term of twelve weeks, and during this time the student is required to pass some ten written examinations and several oral ones. The main school building is a structure three stories in height, with a frontage of ninety-five feet and a depth of fifty-four feet. It is provided with an office, a room with lockers where each student's work clothes are kept, bath rooms, a large creamery room, a cheese-making room and a large room for instruction in farm dairying, a lecture room and a large laboratory. The building cost with its equipments $40,000. The creamery room will give a good example of the completeness with which the various departments are fitted up. It contains, for example, six large separators of the latest pattern used for study and for practice. Besides these are the churns, butter workers, etc. The cheese room is provided with eight steam-heated cheese vats of three hundred pounds capacity, each of which has its own complete set of cheese-making apparatus.

The school day begins at eight o'clock. The students first attend a lecture of fifty minutes in length, and afterward report in snow white working suits and white caps for practical work. One section is instructed in milk testing in the laboratory and another in the mysteries of the creamery. In all there are eight lecturers and nine teachers. Some idea of the work accomplished may be suggested by the fact that two tons and a quarter of milk are required daily for the use of the school.

The student who has passed all the examinations of the dairy school can become a candidate for a dairy certificate. But to secure this he must work in a creamery or cheese factory for not less than two full sessions of seven months each, and during one of these he must have entire charge and be responsible for the cleanliness and success of the factory. He must, besides, report the operation of the factory monthly, and his factory is regularly visited by an authorized inspector. After all these requirements have been fulfilled the certificate is granted.

The school contains still another department which is devoted to instruction in farm dairying. The object of this department is to turn out practical dairymen as required for the farm. These students study the problems of the feeding and breeding of dairy stock, and general farm management.

Science Notes.

Temperature at High Altitudes.—Prof. Assmann recently sent up from Charlottenburg, near Berlin, a small balloon provided with improved automatic registering apparatus designed to reproduce automatically the figures indicated by the barometer and thermometer at various heights. The balloon first started off in a northeast direction, veered suddenly toward the southeast and finally landed in good order in the district of Zvornik, on the Servo-Bosnian frontier, after a voyage of eleven hours. Since the distance between the two points is about 600 miles, the velocity of the balloon was, without counting curves, nearly 60 miles an hour. At the moment of starting, the thermometer marked 17° and the barometer stood at 764 mm. The extreme figures noted by the apparatus during the voyage were: For the temperature, —52°, and for the barometric pressure, 85 mm. This latter reading denotes an altitude of 16,325 meters (10 miles and 546 feet) above the surface of the earth. Such low pressures had not hitherto been suspected at the altitude above stated.

Graphite from Iron.—Having studied the graphites obtained in a variety of ways, and shown that a number of metals can displace carbon in this form from iron, Mr. Moissan has compared the different varieties of graphite liberated from the latter metal under different conditions of temperature and pressure. He finds that, at the ordinary pressure, the graphite formed is purer as the temperature becomes more elevated, besides being more stable in the presence of nitric acid and potassium chlorate. The effect of the pressure on the crystals and masses of graphite is to give the latter the appearance of a fused mass. The small quantity of hydrogen always present in graphite diminishes in proportion as the purity of the graphite increases.

Is Sulphur a Simple Substance?—Mr. Auguste Strindberg, says the Annales Industrielles, asserts, as the result of numerous experiments made by him, that sulphur is a compound of carbon, oxygen and hydrogen, in proportions as yet undetermined. He goes still further than this, and claims that it is not only not a simple body, but not even an original one, being merely a common fossil resin or bitumen. Between it and these substances he finds certain resemblances, such as crystalline or amorphous aspect, brittleness, fusibility, combustibility, insolubility in water, solubility in sulphide of carbon, electrification by friction, etc. Besides, sulphur in a native state is found in the vicinity of bitumen, lignites, anthracite and petroleum. Farther, says Mr. Strindberg, when sulphur is melted at about 120° it disengages an odor of turpentine or camphor, and if a trace of iodine be added, the odor becomes more marked. This, he claims, is because the sulphur resin has lost a part of its oxygen and become converted into camphor. If it be heated anew to between 160° and 230°, it loses more oxygen and drops to the level of a caoutchouc, of which it assumes the color and consistency. Then, if the brown and viscous liquid thus obtained be cooled, it preserves its nature for a certain length of time, and then resumes its state of resin.

Curious Echoes.—One of the most remarkable echoes in the world, says a writer in La Nature, is that produced by the Menai Strait suspension bridge. If one of the abutment piers be struck, say with a hammer, not only will the sound be re-echoed by the pier at the other extremity, which is over six hundred feet distant, but also by all the metallic cross pieces that support the flooring and by the water itself, which repeats the succession of shocks under the bridge. Every blow of the hammer is re-echoed at the rate of five perfectly distinct echoes per second. The effect produced is that of a sort of sonorous and strident metallic trill.

The castle of Simonetta, at about two miles from Milan, produces a curious echo which repeats the detonation of a firearm as many as sixty times, even when the atmosphere is very foggy, and, consequently, unfavorable for experiments.

Not far from the church of Shipley, Sussex, England, an echo is produced of quite a peculiar kind, and which distinctly repeats sentences of eighteen and even twenty syllables.

Finally, we must not forget the echo of the Pantheon, at Paris, where the noise of a cane falling to the floor produces the effect of the firing of a gun.

Preservation of Fruit.—At a recent meeting of the Societe Nationale d'Agriculture, Mr. Tisserand, director of agriculture at the ministry, read a note from Mr. Petit upon the preservation of fruit. Mr. Petit has found that upon keeping fruit, grapes, for example, in a closed place permeated with the vapor of alcohol, it may be preserved for some time. On the 31st of October, 1894, that is to say, very late in the season, some grapes were collected and placed upon wood shavings in a cellar closed as tightly as possible by a wooden door. In the same cellar was placed a vessel containing four ounces of alcohol. Some grapes were also placed in two similar cellars, one of them open and the other closed, but neither containing any alcohol. The temperature of these cellars ranged from 8° to 10° C. On the 20th of November the grapes in the two cellars in which there was no alcoholic vapor were found to be rotten, while in the cellar whose atmosphere had been alcoholized the fruit was perfect and free from mouldiness. On the 7th of December these grapes still presented a very fine appearance, and when tasted by experts were pronounced to be of exquisite flavor. This method of preservation is extremely simple, may be easily applied and necessitates no special installation. Mr. Tisserand thinks that it would suffice to treat with alcohol the wood shavings upon which the fruit is arranged.

Chemical Fern Fronds.—A neat experiment to please the young may be performed in the following way: Saturate some strips of thin cartridge paper with an alcoholic solution of gum benzoin, and, when dry, apply an aqueous solution of bichromate of ammonia. Crimp or fold these slips backward and forward so that when opened out they will stand upright in a zigzag form. Place one of these slips upon a plate and ignite it in two or three places along the upper edge, but without allowing it to blaze. It will burn slowly down with a red glow, diffusing an agreeable perfume, while the ash of the paper will assume the most fantastic arborescent shapes, together with a green color, which, to a lively imagination, may be suggestive of the growth of ferns or lichens.

Cellulose Paint.—A writer in La Nature proposes as a paint for the protection of steel ships and metallic surfaces generally a ten per cent solution of ordinary wood pulp, to which may be added any coloring matter that may be desired. At the moment of using the paint there is to be added to it some sort of siccative, such as an acid salt of lead or of manganese. This paint is said to become finally insoluble and absolutely inalterable.

It is very adhesive, and does not scale off like oil paints, varnishes and lacquers. The paint may be rendered immediately insoluble and resistant by passing over its surface a solution of one of the siccatives above mentioned.

Monkey Skins.—Among the curious products that constitute the wealth of the Gold Coast, the Revue des Sciences Naturelles Appliquées mentions monkey skins. These skins, which are in great demand among tailors, usually fetch from 3 to 9 shillings apiece. The quadruman that furnishes these skins is known to naturalists by the name of Colobus vellerosus. It is of the size of a large dog. Its hair is black, long and silky, and the animal has a white muzzle and a long white tail. The statistics of the colony of the Gold Coast mention the fact that large quantities of these skins are annually exported from Cape Coast, Salpond and Accra. The exportation in 1891 amounted to 187,000 skins, valued at the coast at more than 30,000 pounds sterling. During the last eight years it has reached the figure of 1,075,000 skins.

The Kola Nut.—The State Department has been calling upon the United States consuls in Africa for specific information in regard to the kola nut, which, by its peculiar action upon the muscular system, enables the African negroes to make long journeys, bearing enormous loads under tropical suns and across difficult country without food. Authentically reported cases prove that an old negro may carry a 176 pound bag of coffee four leagues by chewing a single nut slowly. Mr. Robert P. Porley, United States consul at Sierra Leone, Africa, has sent in the first report upon this subject, treating of the methods of growing and preparing the nuts. According to him, the natives eat the nuts early in the morning as a stay against ordinary food while traveling, and in the evening to induce sleep. They consider that a general benefit to the system is derived from the consumption of the kola, say a single nut morning and evening.

Diseases of Peach Trees.

Some years ago a gentleman residing near Cincinnati created a sensation by what he regarded a new method of keeping peach trees healthy. All that he did was to pile up earth about the trees, the mound reaching up to the branches. It took several cart loads of earth to make these mounds, and the little orchard had the appearance of bushes growing out of the top of the cone of earth. Every one used to look on and laugh at the thought of burying up the trunk of a tree in order to make it healthy; but there were the trees, and undoubtedly models of health. Those who saw, simply stated their belief that it was only a coincidence, and that the trees would probably have been as healthy without the mound of earth as with it. Since it has come to be well recognized that many of the diseases of plants, not merely of the peach tree, but of other trees, are caused by the mycelium of a minute fungus attacking the roots, it is not at all unlikely that this mound of earth operated beneficially by preventing the growth of the fungus which preys on the roots of trees. It is now well understood that all plants of a low order of vegetation, which we know as fungi, will only grow under a peculiar combination of circumstances. Among other things they must be near the surface of the earth, and if buried to the depth they would be under a mound, it is unlikely that fungi would find a satisfactory home.

Some will say right here that they thought burying up the trunks of trees and covering the surface roots with earth was destructive to health; but the burying by itself is not the reason trees die when earth is piled over them to a considerable depth, but from the fact that the young, growing roots do not get air. These young, growing roots are almost all at the extremities, and the mound of earth around the trunk would not in the slightest degree injure these outer roots. Whenever a valued tree is somewhat buried, it is customary to leave a space around the trunk, perhaps building a dry wall, in order to keep the earth from getting near the trunk; but this is not that the earth is injurious, but to give a chance for water to flow freely down into the soil, and the flow of water always leads to a flow of air following the water. These remarks are suggested by an article in an agricultural paper, stating that the apple borer and the peach borer have been kept out of the trunks of trees by making a mound of earth around the trunks.—Meehans' Monthly.

The African Transcontinental Telegraph.

Early in 1893 it was announced that the telegraphic system from Fort Salisbury, in Mashonaland, would be continued through the African continent to connect with the Egyptian system at Cairo. A company was formed with a capital of $2,000,000, and on September 27, 1894, the line was open from Cape Town to Blantyre. Commencing at Salisbury, the line is to cross the Zambesi, in the neighborhood of Tete, and continue to Zomba. From Zomba the line will skirt the shores of Lake Nyassa up to Karonga. From Karonga the line will be continued along the Stevenson road, which runs over the uplands on the Tanganyika plateau, and it will touch the lake at a point on Abercorn Bay. From the north of Lake Tanganyika the line will proceed to Victoria Nyanza, and thence to Uganda. The wire will be strung on light iron poles. When connection is made with the Egyptian lines at Wady Halfa, it is expected that messages will be transmitted from London to Cape Town at one-third the present cable rates.