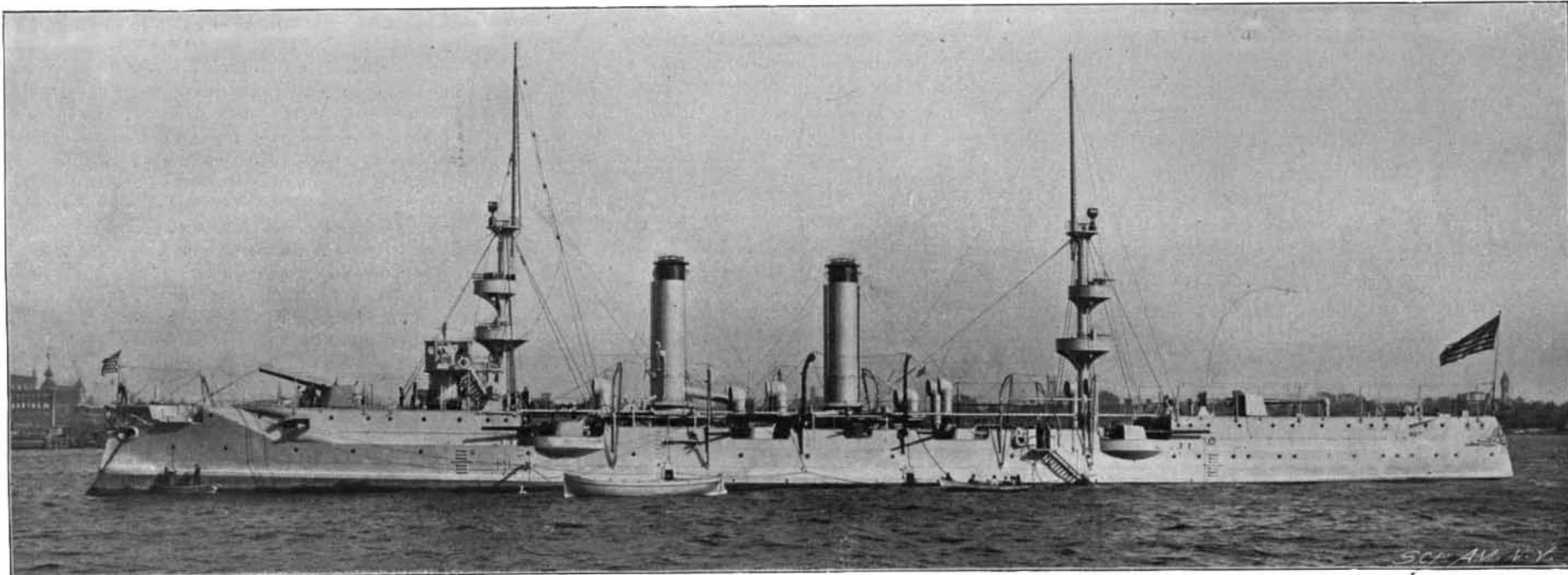


PRESENT AND PROPOSED CRUISERS OF THE UNITED STATES NAVY COMPARED.

The recent war has imposed upon the United States responsibilities that are entirely novel and of far reaching consequence. The battle of Manila sounded the death knell of our policy of isolation, and the treaty of Paris so greatly extended the borders of our possessions that they may now be said to be conterminous with

ed that if these ships are built as designed they will be greatly inferior to ships of a similar size and type that are built or building for other navies of the world. Among the vessels selected for comparison was a United States ship, the "New Orleans." We are now enabled to present for comparison illustrations of both the new cruiser and the "New Orleans," and with a view to bringing out clearly the points of advantage

against none, and has 3 inches of armor along the side slopes of the deck as against 2 inches for a third of the length; she carries 407 men as against 290; she has at present two torpedo tubes as against none, and her battery is heavier and more numerous. And yet the "New Orleans," though an ideal fighting machine, is not by any means a phenomenal boat; she merely represents modern ideas among the naval constructors of



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THE 3,500-TON PROTECTED CRUISER "NEW ORLEANS."

Trial Speed, 21.2 knots. **Coal Supply,** 800 tons. **Waterline Length,** 346 feet. **Beam,** 43 feet 9 inches. **Full-load Draught,** 20 feet. **Armor,** complete 1 1/4-inch protective deck from stem to stern increased to 3 inches on the slopes. **Armament,** six 6-inch rapid-fire guns, four 4.7-inch rapid-fire guns, ten 6-pounders, four 1-pounders, four machine guns, two field pieces. **Torpedo Tubes,** 2. **Complement,** 407. **Date of Design,** 1896.

those of every nation that has a fighting ship afloat upon the high seas. Hence our navy has taken on a new meaning in the minds of the American people—it is no longer a mere adjunct of our coastline fortifications; it is our foremost line both for offense and defense. The countless islands of the Philippines scattered over a hundred leagues of sea call for ships that can steam both far and fast, ships which, when they have outstripped the enemy, can present a fighting line that is better able to give and take the hard knocks of a sea fight, and reasonably sure to fulfill to the letter the significant orders, "Sink or destroy."

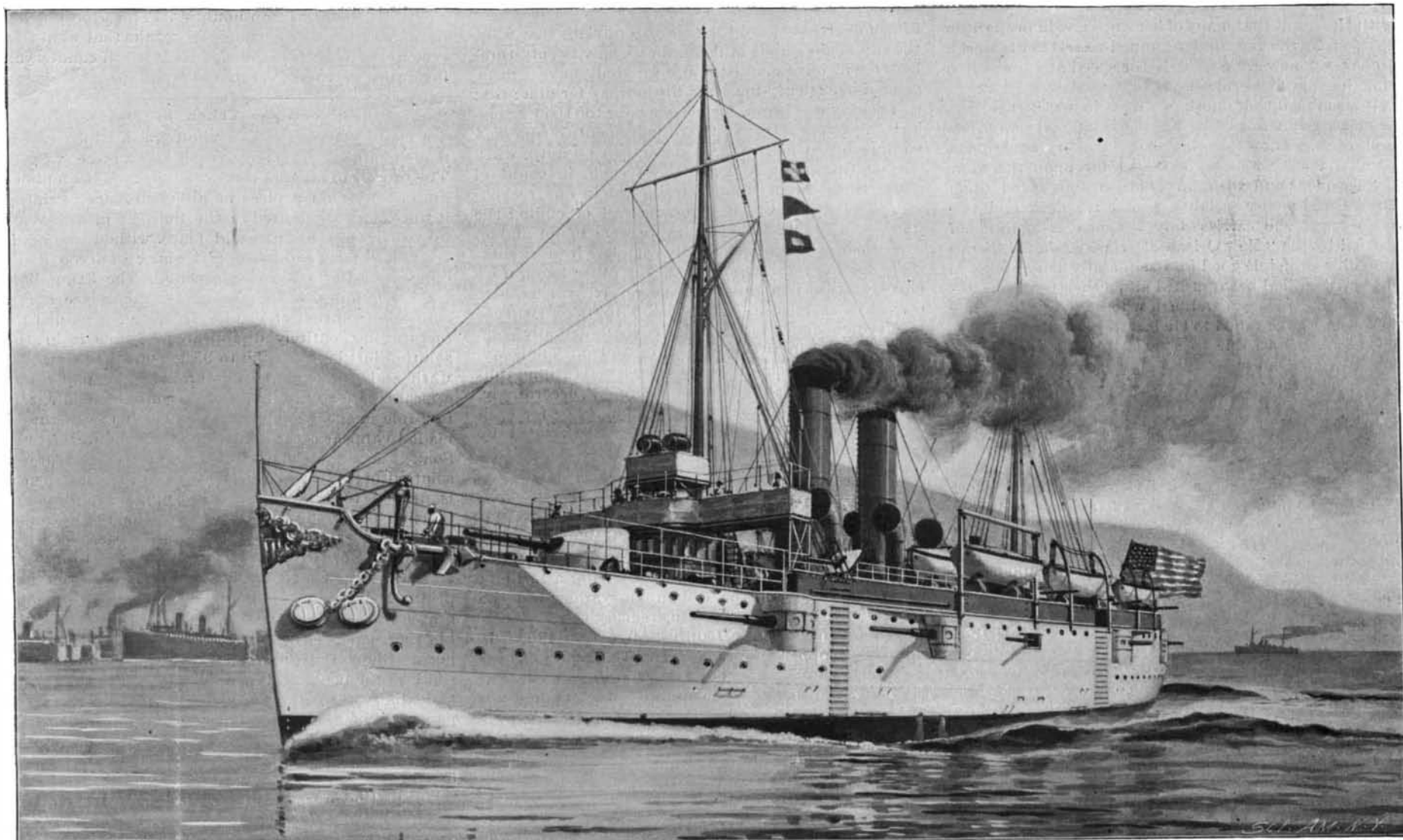
In our issue of August 19, we gave some details regarding the plans of the proposed six new cruisers which were authorized by the last Congress, and show-

possessed by one over the other we have compared the ships point by point in tabular form. We find that the full load displacement of the "New Orleans" is slightly over 3,500 tons, or practically the same as that of the new cruisers. This vessel is, therefore, an admirable foil to set off the good or bad points of the new design, for not only has she been tested in actual warfare, but, like the "Denver" class, she is sheathed and coppered and therefore suitable for a long stay in tropical waters without docking.

We find, then, that on every point but one the "New Orleans" shows a superiority, and on some points an overwhelming superiority, over the proposed cruisers; for she has 4 1/2 knots more trial speed, she carries 100 tons more coal, has a 1 1/4-inch protective deck as

the world as to what elements should be combined in an up-to-date 3,500-ton sheathed and coppered cruiser.

It will naturally be asked, What has been done with the 3,500 tons of displacement in the new designs? It is reasonable to suppose that with a speed less by from 3 1/2 to 4 1/2 knots (for the ships according to the contract may be accepted at a reduced price if the speed is less than 16 1/2 but does not fall below 15 1/2 knots), with 100 tons less coal, no protective deck, no torpedo tubes, and also with a saving in weight due to carrying 117 fewer men and their supplies—it is reasonable to suppose, we say, that some compensating advantages must appear in the new boats that are not seen in the "New Orleans." There is an undoubted advantage in the fact that the new ships are to have a flush upper deck, and will,



THE PROPOSED 3,500-TON SEMI-PROTECTED CRUISER "DENVER" AND CLASS.

Trial Speed,* 16 1/2 knots. **Coal Supply,** 700 tons. **Waterline Length,** 292 feet. **Beam,** 44 feet. **Full-load Draught,** 17 feet. **Armor,** no protective deck, but a 2-inch strip on the slopes for 105 feet amidships. **Armament,** ten 5-inch rapid-fire guns, eight 6-pounders, two 1-pounders, four machine guns, one field gun. **Torpedo Tubes,** none. **Complement,** 290. **Date of Design,** 1899.

*The ships will be accepted at a reduced figure if the speed is not below 15 1/2 knots.

therefore, be drier boats in heavy weather, and will provide more liberal breathing space for officers and crew. By comparing the illustration of the two boats it will be seen that the "New Orleans" has a fore-castle deck, an open waist amidships, and a poop, whereas in the new ship the space between fore-castle and poop is decked in, thereby affording an unbroken upper deck from stem to stern. This means the addition of considerable weight at a height of 16 or 18 feet above the waterline, and other things being equal, we should expect that this addition was made at the sacrifice of some other features of the ship. But other things are not equal; for even if we allow that the 1 1/4-inch protective deck of the "New Orleans" offsets the weight of a flush upper deck, that vessel still possesses a vast superiority in speed, better protection on the slopes, more coal, and over 30 per cent more men to fight the ship; to say nothing of the superiority of her armament.

While it goes without saying that a ship with a flush upper deck is drier in a seaway than one with fore-castle, open waist, and poop, it has yet to be proved that it is wise to sacrifice speed, coal and armor merely to prevent a ship from throwing a little water aboard in squally weather. Unless we have altogether mis-read the lessons of American naval history, unless we have quite failed to appreciate the fighting spirit of Paul Jones, Decatur and Farragut, we think that the typical American seaman would be quite willing to receive an occasional swish of salt water in his eyes or a roll of green seas across his deck for the sake of an extra gun or two in his battery, or 3 or 4 knots extra speed on tap in the engine room at the critical moment. During the operations of the late war, the "New Orleans" was able to respond at any moment to a call from the Admiral for a 19-knot sea speed, and her varied experience in the twelve months of her service has never seen a time when she could not "cast loose" her guns for action. Seaworthiness is of course a prime factor in a warship, but in this, as in all other matters, it is possible to go to extremes. England has done so,

dent from what we have said that the sacrifices in speed and protection are out of all proportion to the benefits secured. It would have been better to have taken the "New Orleans" as a basis and given her a flush deck and improved freeboard at the cost of an additional two or three hundred tons of displacement rather than to have gained roominess and comfort by building half-protected cruisers, which, by the very terms of the contract, may be thrown upon the country's hands with a speed of only 15 1/2 knots, and this, moreover, in an age of 20-knot battleships!

Losing or Gaining a Day.

"Where a Day is Lost or Gained" is the title of a paper in the Century for September, in which Benjamin E. Smith, editor of the Century Dictionary, tells of the difficulty of reckoning the days of the week in traveling east or westward.

The difficulty that may lie in a matter apparently so simple is well shown in one of Poe's stories. The obdurate father of the maiden—evidently with the Greek calends in mind—promises to give her to the objectionable swain when three Sundays occur in one week. To his consternation, and the joy of the lovers, this seemingly impossible event indubitably happens when two sea-captains appear together upon the scene who have circumnavigated the globe in opposite directions.

As a matter of fact, this bit of fiction represents what is taking place every day in the year, and must continue to occur as long as our present method of reckoning time is retained. And the reason for this is simple and familiar. The civil day begins and ends at midnight, but for convenience of explanation let us assume (as is the practice of astronomers) that the day begins at noon and ends at the following noon. It is clear that the interval of time between two successive noons will be, for us, twenty-four hours (a day as measured by one complete rotation of the earth) only when we remain on the same meridian. For, if at noon on the beginning of Monday we move, say, over a space of

Sugar Industry in Trinidad.

Minister Loomis sends from Caracas, under date of June 14, 1899, a clipping from the Port of Spain Gazette, setting forth the condition and prospects of the sugar industry in the island. Trinidad, says Mr. Loomis, is one of the most successfully governed and prosperous of the British possessions in the West Indies and is a model colony. The largest cane factory in the West Indies is the Usine St. Madeleine, referred to in the article. About nine-tenths of the machinery with which the factory is equipped came from the United States.

The article reads, in part:

"The last crop season has presented some remarkable features, well worthy the attention of others besides planters, because they are indications of material progress. First, there has been the expansion of the cane farming system to a degree which will be best realized from its financial side. Over \$100,000 have been paid to cane farmers during the last four months, and this, with other expenses entailed, accounts for the dearth of notes and gold at the Colonial Bank. . . . The flux and reflux of money in the colony indicates a more prosperous condition of things than was previously the case. In view of the fact that no abnormal change had taken place in the cocoa production, it must be due to the improved prospects of the sugar industry.

"The study of this material change for the better presents some interesting features. We first perceive that this year's sugar crop is a large one, exceeding the average of 56,000 tons. Nearly one-fourth of the crop has been made by the Usine St. Madeleine, whose output to the closing day this week is 13,000 tons—an increase of 1,500 tons over the output of last year. This Usine is the premier central factory in the West Indies since the war in Cuba, where previously the Constancia factory and two others exceeded the output of the local Usine. A characteristic of the crop operations has been not only that farmers' canes have been plentifully bought by the factories, but that one or two estates which were threatened with abandonment have continued to exist by also selling their canes to the factories. . . .

"Another notable feature of the sugar crop this year was the effect of the American countervailing duties in putting new life into the local and Demerara sugar industry. The same result has been reported in the case of Mauritius in consequence of the imposition of the Indian countervailing duties. The planters of that island are now shipping sugar at remunerative prices to India. And yet there has been no great rise in the price of sugar to startle the American or Indian consumer; but a fair market has had its inevitable result for an industry enabled in the nature of things to hold its own, and only prevented from doing so for some years past because of markets artificially rigged by the European bounties. This affords a clear demonstration of the beneficial results that would accrue to the West Indian sugar industry if countervailing duties were imposed by England."

Photographs Taken by Magic.

A magic photograph is a photograph which can be made to appear on an apparently blank piece of paper. The process of making it is as follows: Make a photographic print on a piece of albumen paper, printing it the exact tone desired in the finished print. Wash for two or three minutes and place, without toning, in the fixing bath, composed of 1 ounce of hypo and 8 ounces of water. Leave the print in the fixing bath for five minutes, wash thoroughly, then place it in a saturated solution of bichloride of mercury until the picture has entirely disappeared. Leave it in this solution just long enough to bleach out the print, then wash and dry as for other prints. The paper now appears perfectly white, but it contains a latent or invisible image. The magic by which the picture is made to appear is the action of hyposulphite of soda. Soak a piece of clean blotting paper in a saturated solution of hyposulphite of soda, and dry. When it is desired to make the picture appear, moisten the blotting paper slightly, and place the picture on it face down, rubbing it to insure perfect contact. In a minute or two the picture will begin to appear, and will soon be as bright and clear as when first printed. When one wishes to show this magic photograph, it is more surprising to the uninitiated if the blotting paper has been moistened and placed in a book. Show the apparently blank piece of paper, slip it in the book, and in a minute or two take it out, and what was to all appearance a piece of plain white paper will be found to have a picture printed on it. The picture will disappear after being exposed to the light for some time, but it can be made to reappear indefinitely. It will be found that much interest is taken in the process, and the production will afford much astonishment.—Hobbies.

THE Tripler Air Power Company is to be reorganized, and it is said that Mr. Tripler has discovered a process by which liquid air can be safely and economically furnished for refrigerating purposes.

	Full Load Displacement, Tons.	Speed, Knots.	Coal Supply, Tons.	Protective Deck.	Armor on Slopes of Deck.	Crew, Officers and Men.	Torpedo Tubes.	Main Battery.	Secondary Battery.	Waterline Length.	Beam.	Draught, Full Load.
New Orleans.....	3500	*20	800	1 1/4-in.	3-in.	407	+3	six 6-in. r. f. four 4 7/8-in. r. f.	ten 6-pdrs. four 1-pdrs. four mch. guns. two field guns.	346 ft.	43 ft. 9 in.	20 ft.
Denver Class.....	3500	†16 1/4	700	none.	2-in. for 105 ft.	290	none.	ten 5-in. r. f.	eight 6-pdrs. two 1-pdrs. four mch. guns. one field gun.	292 ft.	44 ft.	17 ft.

* The speed of the New Orleans on trial was 21.2 knots. † One of these has been removed.
‡ If the speed on trial is as low as 15 1/4 knots, the ships will be accepted at a reduced price.

with the result that many of her ships are, in proportion to their size, the most under-gunned vessels in the world. In our six new cruisers, it is the speed and protection that has been sacrificed.

It is claimed that another feature in which the new vessels are superior is the accommodations for officers and crew. These are stated to be very superior, a point that may well be conceded, for upon the same displacement and with hundreds of tons saved upon engine and boiler weights, protective deck and torpedo outfit, she carries only 290 men as against 407 carried by the "New Orleans." Here again it looks as though a principle good in itself, and when applied in moderation, had been pushed altogether too far. Inquiry of both officers and men who have served on the "New Orleans" failed to elicit any serious complaints of inconvenience due to overcrowding. Give to the typical American sailor a reasonable amount of living space, and then offer him his choice between more guns, more speed and better protection, or a few cubic feet additional space in his living quarters, and he will take the ship with the better fighting qualities in every case.

It is evident from the shallow draught and short length of the proposed ships that their slow speed must be due in part to their fuller lines. Although the "New Orleans" is 54 feet longer, of 3 feet more draught and the same beam, her displacement is about the same. Hence it is certain that her lines must be very much finer and undoubtedly the 4 1/2 knots extra speed is partly due to this. Again, her large horse power (7,500 as against 4,500 for the new boats) is obtained without a proportionate increase in weights, by using a high speed of revolution in the engines; a principle that has been adopted with success in other ships by the same designer. Other economies in weight are due to the fact that from stem to stern there is nothing in the ship of the purely ornamental or fanciful; the broad principle of utility has been followed to its ultimate limit, and in this respect the "New Orleans" is more like an American production than the product of a European yard.

The effort of the department to secure ships of exceptional seaworthiness and liberal berthing accommodation is highly commendable; but we think it is evi-

fifteen degrees toward the east, it is obvious that when the sun again stands at noon, for us, only twenty-three hours will have elapsed, since we shall have accomplished one twenty-fourth of his journey for him; that is, Tuesday will begin, for us, one hour too soon. Similarly, if we repeat this eastward movement, Wednesday will begin two hours too soon; and so on until, when our starting point is reached, we shall, in count of days, be just twenty-four hours ahead in our reckoning. The result will be that, instead of ending the journey in twenty-four days (as we seem to do) and on a Wednesday, we shall actually complete it in twenty-three days and on Tuesday. On the other hand, if we move westward in this way, the reverse will happen. Our days, as measured from noon to noon, will be twenty-five hours long, and we shall actually complete the trip in twenty-five days and on Thursday. For the stay-at-home, and for travelers returning thus from the east and from the west, there will, accordingly, if no correction is made in the reckoning, be for each day three distinct dates, each perfectly corrected by diary or log; and each day of the week—not Sunday simply—will be repeated thrice.

A New Remedy for the Phylloxera.

The Italian Minister of Agriculture and several scientists of that country are engaged in testing a medium which is to protect the Italian vineyards from the ravages of the phylloxera. This remedy was first employed by the vintager Lauro d'Angelo on Elba. It consists of copper sulphate and its application is exceedingly simple and cheap. According to the Naturwissenschaftliche Wochenschrift, the plants are sprinkled with dissolved copper sulphate and some is thrown on the ground in a powdered state. By the rains in fall, winter and spring, the powder is dissolved and enters the soil. The method employed by d'Angelo consists in giving the vines first two liquid treatments, followed by five with the powder. In the former case there are used 1 per cent of lime and 1.8 per cent of copper sulphate per 100 kilos of sulphur; in the second case the vine plants receive two treatments with 2 per cent of copper sulphate and three with 5 per cent to every 100 kilos of sulphur.