Correspondence.

Some Calendarial Facts.

To the Editor of the Scientific American:

The following corrections should be made in my article entitled "Some Calendarial Facts About the Twentieth Century," printed in your issue of September 23, 1899:

In the third paragraph, line three, "twenty-four" should be "twenty-five"; line twelve, 1968 should take the place of 1969; lines seventeen and eighteen, instead of 1906, 1928, 1956, 1984, respectively, read 1902, 1924, 1952, 1980. In the next to the last paragraph, lines fifteen and sixteen, "wholly" and "only partially" should exchange places. Benjamin F. Yanney.

Mount Union College, Alliance, Ohio.

The Yacht "America."

To the Editor of the Scientific American:

The interest taken in everything pertaining to the international yacht races is my excuse for calling attention to certain facts in regard to the old "America," which are not generally known. Many pictures of her have been recently published showing her original rig with a single topmast and one large jib. While this was the rig that she actually used, the appearance of the pictures is not at all like the boat herself. When she made her famous race her masts had an amount of rake very much greater than is ever seen at the present day and more than her masts had afterward. At the time of her race a plumb bob dropped from the masthead would strike her taffrail. A reference to the London Illustrated News of 1851, of a date a week or two later than the races, will confirm this statement.

There was another remarkable feature in the "America" in her original form which has not received notice, and in some of the engravings which have been published showing the longitudinal section, grave mistakes have been made. She had a sternpost of unusual length and great rake. Her draught of water forward was said to be in the neighborhood of one-half what it was at the sternpost, and it was generally understood that she was modeled in what the old designers used to call a drag line. That was that the water lines as laid down were inclined to the true water line and were lower at the stern than at the bow.

The boat was purchased by an Englishman not long after the races in 1851, and in accordance with English ideas the rake was taken out of the masts by giving them new steps and she was ballasted so as to bring her more nearly on even keel. This change of rig and ballast took the speed out of her and she was no longer able to work to windward as before. Indeed she could not lie nearly as close to the wind as with the raking masts. When she fell into the hands of the United States government, her masts were very much nearer a vertical than they were originally and have remained so until the present time. The possibilities are that if they were given the original angle of rake she would be a very much better boat than she is at present, although when going free or "winged out" there would be difficulty with the booms coming home, a fault which all vessels with raking masts encounter.

One of the peculiarities which greatly impressed all English writers when she made her appearance in British waters in 1851, was that her sails were as "flat as boards" and that they were laced to the booms at the foot. This was a great novelty, as the old English idea was to allow the sail to belly so as to contain as much wind as possible, the thought being that the quantity of wind contained in the sail in some way increased the driving power. In a recent interview, Mr. Ratsey makes mention of the fact that he, with his father, visited the "America" in 1851 and studied her rig and the cut of her sails very closely. If the descriptions of the latest Herreshoff sails are true, he has been returning to English practice while Mr. Ratsey has followed as closely as possible the example set by the "America." The photographs of the two boats seem to bear out this idea. Most of them show the "Shamrock" with sails much flatter than those of the "Columbia."

In this connection, one of the most valuable things for the racing public would be to obtain descriptions of the experiments tried years ago by Mr. Stevens in regard to the relative value of different rigs. These have been alluded to several times within the last year, but only in a very general way. Tradition has it that he built boats of large size as nearly identical as possible and then rigged them in different ways and raced them against each other, changing crews from one to the other, and then to make the equality perfect, changing rigs and beginning a new set of races in which crews again exchanged boats. It would, at least, be interesting to know the speed obtained by the boats in his day and how close they could sail to the wind. The older men seem to think that the "America's" speed has been very greatly reduced by the modifications which have taken place in her rig, and that she would be fast at the present day by the side of anything except a racing machine. W. E. Partridge.

Philadelphia, October 13, 1899.

Control of the San Juan River at Greytown.

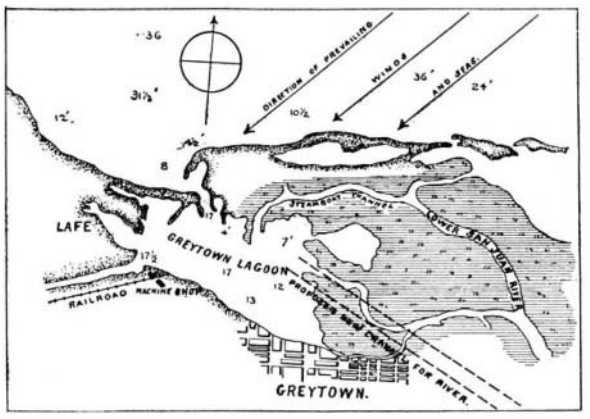
To the Editor of the Scientific American:

It is true that the approaching completion of the Panama Canal raises a question for serious consideration whether it is wise for the United States to begin another, for the same purpose, at this time.

But it can only be a question of time—one railroad across our continent was once thought sufficient, and it will do no harm to discuss, for future need, the physical questions involved.

Your correspondent wishes to offer his mite concerning the obstructions in Greytown harbor, the eastern terminus of the proposed Nicaragua Canal, described and illustrated so handsomely in your issue of February 18.

Reproductions of the plates of the harbor in 1832 and 1895, and that of the delta of the San Juan, together with statistics quoted from this article, show clearly the cause of the trouble. Silt, discharged into the sea through the delta, is swept along the coast by currents produced by the trade winds, and finding repose



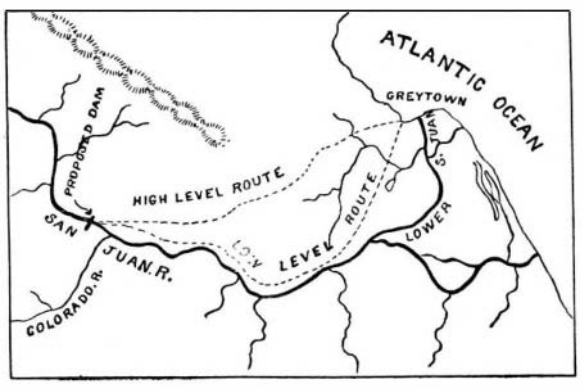
MAP OF GREYTOWN HARBOR, SHOWING PROPOSED NEW CHANNEL FOR THE SAN JUAN RIVER.

in the pocket forming the harbor of Greytown, it has accumulated there for ages.

But, before proceeding to discuss a remedy, we must glance at surrounding conditions. Lake Nicaragua, through which the route passes, has an area of 3,000 square miles, a drainage basin of 12,000,000 square miles, and an annual rainfall of 256 inches, or about 21 feet.

The San Juan River, the outlet of the lake, is 120 miles in length, has a minimum discharge in the dry season of 12,000 cubic feet per second, with a maximum discharge in the rainy season of 60,000 cubic feet per second, according to some authorities, and 150,000 cubic feet per second according to others, the latter figures representing a volume equal to two-thirds of the average flow over Niagara Falls; and the silt brought down to the sea, annually, is estimated at 600,000 cubic yards.

It is obvious that no jetty can be built in the harbor which will not be outflanked by this silt so long as it



THE DELTA OF THE SAN JUAN.

is turned loose to windward. But why allow this? Keep it in the river, and make the river clean out the harbor.

Levee in, for twenty-five or thirty miles, the branch of the delta known as the lower San Juan Coast, with an approach to the harbor ranging with the east, as represented by dotted lines on the plates, the material for the levees of this approach to be taken from a central trench, to guide the flow in its incipiency, and let this be done during one dry season. As soon as possible in the beginning of the next dry season dike up all outlets except the new one, so that the new channel will be partially cut before the floods come, and then let the river do the rest.

During one wet season the concentrated flow of this mighty torrent would open a channel deep enough for any craft afloat, not only to Greytown, but to points many miles above, making it possible to shorten the canal to that extent if the low level route is adopted, or, if the high level route is selected, deep water would be brought to its terminus. And in this long stretch of river well sheltered anchorage would be found for unlimited numbers of ships.

The silt, we must remember, would no longer move along the coast outside, but would now be suspended in the river current, from which it could not be dropped in the form of a bar, until the velocity of this current was assisted by impinging upon still water. But instead of impinging upon still water the river current would form a junction with the outside current at an acute angle, by which the silt would be carried on and distributed along the coast beyond, rendering the formation of a bar impossible.

To appreciate how peculiarly well the San Juan is adapted to the service proposed, we must glance at what occurs in other large rivers. In the Mississippi, for instance, there is a never-ending supply of silt from its head waters to the sea, one flood rolls this load along the bottom a certain distance and then drops it for the next flood to take up. In all parts and in all seasons the bottom is thus encumbered.

But in the San Juan conditions are entirely different. The silt of the upper drainage basin goes into the lake and stays there, leaving only that of the river and its lateral tributaries below the lake to find its way to the sea. Under the enormous rainfall of that locality, Lake Nicaragua becomes a huge standpipe from which great volumes of uncharged water pour, long after the lateral tributaries of the river have ceased bringing down solid matter. This afterflow then sweeps out the silt left in the river's bed, and, as no more is coming in, the bottom is thoroughly cleaned; and the same result would be obtained in the harbor's bed when the river is concentrated upon it.

This action will be enhanced by the structures of the canal, for a dam would be placed on the river about half way down, making slack water back to the lake. This would cut off all silt in the river above the dam, and lessen by one-half the distance to be cleaned out below.

The cost of constructing a harbor at Greytown is estimated at $2,500,000 by one authority and at $9,500,000 by another. One-half of the lesser estimate would be in excess of what would be required by the plan proposed, and keeping up the levees would be the only cost afterward. William W. Blackford.

Lynnhaven, Princess Anne County, Va., September 20, 1899.

Army Transport Service.

To the Editor of the Scientific American:

Will you kindly give answer to the following naval questions in your esteemed journal?

1. The navy department is supposed to be in great need of a certain class of vessels for Philippine service.

The "Columbia" and "Minneapolis" are not in commission at the present time, although it would seem that in these two splendid ships the navy possesses a pair of cruisers extraordinarily well adapted to the particular needs of the Philippine work. They are economical ships under one screw and capable of the highest speed when necessary. They are of fairly light draught and carry a large complement available for duty in cutters and launches about the coast inlets, etc., and it is possible to give them extra large complements of marines for shore duty. It is even possible to use them for moderate troopship service, among the islands where a battalion of infantry must frequently be needed for quick transportation over short distances. They are also probably the "coolest" ships in the navy for tropical service. It would be interesting to know why two such excellent vessels, possessing qualities that are in great demand at the Philippine Islands just now are kept tied up at a navy yard dock, although it is of course understood, that there are reasons of some sort not generally known outside the efficient navy department.

2. The New York papers state that the rebuilt "Chicago" has no electric illuminating plant. This seems queer. Is it not incorrect? Reader.

October 11, 1899.

[1. The "Minneapolis" and "Columbia" would not be suitable for the service proposed by our correspondent. These ships require an enormous complement to run them, and this is one of the chief reasons for their being laid up. At a time like the present, when officers are so badly needed, better results are obtained by having the same number of officers and men serve on several smaller boats of lighter draught, and the policy of the Navy Department is to place in commission few of the larger and more of the smaller boats. When larger ships are used in the Philippines, it is desirable to send out completely armored vessels such as the "Brooklyn" and "Oregon." Moreover, the large complement of officers and men necessary for the "Minneapolis" and "Columbia" leaves but little room on these ships for transport service; indeed they possess few qualities that could not be found on merchant ships of the same size that would have a large capacity as troopships.

2. The statement that the "Chicago" has no electric illuminating plant is absolutely untrue.—Ed.]

The specific inductive capacity of gutta percha is 2·46, of rubber 2·34, of paper nearly unity. The average capacity of a telephone cable should be 0·080.