Correspondence.

Early Iron Ships.

To the Editor of the SCIENTIFIC AMERICAN:

In looking over some old numbers of your paper, I came upon the letter of Mr. William Owen in the issue of December 1, 1900. No doubt his dates are correct as to the iron ships he mentions. I wish, however, to add to his list a statement of an earlier date of an iron ship which went from the Atlantic to the Pacific Ocean.

In 1850 I went from New York to San Francisco in the iron bark "Polk," then in the service of the United States government, sailing in the revenue cutter service, under the Treasury Department.

Her hull was wholly of iron, with wooden spars. My recollection is she was built at Richmond, to try some new-fangled wheels which were not successful. It was then proposed to convert the hull into a light vessel for the Sow and Pigs Shoal.

But Lieut. John McGowan, father of Capt. McGowan, now in the navy, said he could take her to California, and after a good deal of opposition he was allowed to try the experiment. We sailed from New York early in March, 1850, and arrived at San Francisco in August, after a passage of one hundred and fifty-eight days, all hands in good health.

I think this date may be given as the earliest of any passage of an iron vessel from the Atlantic Ocean, around Cape Horn, to the Pacific Ocean.

So far as I know, I am the only survivor of those who sailed in the wardroom, of whom I now remember the names of about a dozen.

CHARLES H. ROCKWELL.

Tarrytown, N. Y., April 15, 1901.

The Locomotive of the Future.

To the Editor of the SCIENTIFIC AMERICAN:

I have just read with great pleasure your article on "The Locomotive of the Future," in the SCIENTIFIC AMERICAN of April 27. My business leads me to have more or less to do with locomotive engineering, and as I read your article one or two statements struck my fancy, and I wish you would explain them more fully to me.

First.—How will you get 110,000 pounds on each set of coupled drivers? This weight, added to the weight carried by two four-wheeled trucks, would bring the weight of the tender to about 130,000 pounds, reckoning low. Since the weight of a tender now seldom exceeds 40,000 pounds, the engines, by your calculations, would weigh about 90,000 pounds.

Second.—You noted Sturrock's engine of 1855. His engine, as you may know, carried engines on both the locomotive proper and the tender. By this means the tender propelled itself. In the engine of your description the tender propels itself, but the dead weight of the boiler, firebox and frames must be brought into account.

I think that your plan is excellent to a certain extent, but I think that you would be able to produce too much power for the tractive power of your engines.

I believe that the most feasible way to increase the heating surface will be to lengthen the boiler. This can be done to quite an extent, and will certainly increase the economy of coal consumption, as more heat will be absorbed from the gases during their longer flow through the tubes. W. EMORY WARDNELL.

Worcester, Mass., May 2, 1901.

[Our correspondent evidently considers that the adhesive weight would be too small for the power of the engines; but the transfer of the engines, drivers and heavy framing to the tender, together with the great increase in the bulk of the tender itself, to say nothing of its fuel and water, would be found to provide the necessary adhesive weight.—Ed.]

Work on the Cairo-Cape Telegraph.

The work of constructing the Cairo-Cape telegraph line is being actively carried on, and keeps pace with the construction of the railroad from Mombassa to Victoria Nyanza. At the end of last year the length of this part of the line reached 480 miles. The wire used in the construction weighs 650 pounds per mile. Between Mombassa and Nairobi, a distance of about 310 miles, the communication is made by three wires, and after the latter point two wires are used. About 45 intermediate stations have been opened for communication. Between Railhead and Port Florence, the terminal station of the Victoria Nyanza section, a temporary line has been constructed, but from Port Florence to Eutebbe, the capital of the Uganda protectorate, the line is in a completed state, or nearly so. Instead of cut poles, living trees, the branches of which are cut off, are planted along the line. Experience has shown that the living trees are not attacked by white ants like the poles. These trees take root easily, and only need to have the branches cut off from time to time. The wires are fixed simply by well-tarred hemp cords, which take the place of insulators. The trees will be replaced later on by iron poles, as has already been done over a part of the system.

Electrical Notes.

A full length marble statue of Dr. William Gilbert, the father of electrical science and author of "De Magnete," is to be erected at the instance of the members of the medical profession at Colchester, his old home.

The dielectric strength of ice increases with a falling temperature, and is more particularly effective against intermittent currents or those alternating at high rates. Tesla suggests inserting a transformer in a freezing jar, and has patented a system of underground conductors where the two mains are the flow and return pipes which carry a cooling material, the pipes themselves being buried in wet cement or water, in a trough.

Consul-General Guenther, of Frankfort, on February 23, 1901, writes: An automatic system of signals for the purpose of warning vessels in stormy weather against the proximity of reefs and rocks has been exhibited to German marine experts. The automatic part of the apparatus is said to consist of a wheel with a number of cogs arranged at suitable intervals, which slide over a Morse apparatus. The latter is connected with a ladder placed vertically on rising ground on shore or on a light-house. The electric waves emanating are taken up by receiving apparatus on vessels having such within a radius of seven miles. A bell sounds and the receiver notes the spot against which vessels should be warned.

Electricity played a curious part in a recent lawsuit. A certain telegraph company was not allowed to have its wire run into a race course. Telegraphic operators were stationed in a cupola of a hotel opposite the grounds, and signals were transmitted to them from the race track by means of electric lights concealed in the hats of the party seated in a carriage, including the coachman on the carriage. The results of the races and the betting were thus communicated to the operators, who were enabled to send out the information to poolrooms. The gentlemen who were electrically equipped were arrested, and after some years a verdict of $5,000 was obtained against the detectives who made the arrest.

It has been proposed to erect at Dundee, Scotland, a granite monument over the grave of James Bowman Lindsay. He was born in 1799 and taught electricity, magnetism and other subjects in Dundee, where he died some forty years ago. In 1834 he foresaw that "houses and towns will in a short time be lighted by electricity instead of gas, and machinery will be worked by it instead of steam." This prediction was the result of his observations of the effects produced by the electric current, and not merely by dreaming. In 1854 he transmitted telegraphic signals through the water electrically, and when the British Association visited Aberdeen in 1859 he demonstrated the success of his method by sending signals across the harbor. He also read a paper entitled "Telegraphing Without Wires."

James D. Reid, an associate of Prof. Morse, died lately in New York city. He was born in Edinburgh, Scotland, and came to Canada in his sixteenth year. Later he went to Rochester, and while there became acquainted with Prof. Morse, the inventor of the telegraph. Mr. Reid was for a while associated with Prof. Morse in perfecting his invention, and then went to Pittsburg and opened the first telegraph office in that city. He was for a long time the superintendent of the old Ohio and Pacific Telegraph Company, which was afterward absorbed by the Western Union. While he was in charge of the telegraph office at Pittsburg, Andrew Carnegie, who was then a boy, applied to him for a position, and Mr. Reid set him at work as a messenger. Mr. Carnegie has often said that this was the starting of his successful career, and the friendship between the two men ceased only with Mr. Reid's death.

Considerable consternation has been caused in London by the announcement that dwellings along the route followed by the new electric railway are suffering severely from vibration caused by the running of the trains. In some instances it is stated that the houses are in a perpetual tremor, while the windows incessantly rattle. The chief center of complaint is near the West End terminus of the line, which is probably due to the fact that there is less vehicular traffic in the streets at this part of the city, thus causing the peculiarity to be more readily observed, and also that the line is brought somewhat nearer the street surface than elsewhere, though in this instance it is over 60 feet below the thoroughfare. An inquiry is to be made into the complaint, to ascertain the cause of such excessive vibration and whether it is possible to remedy it. When the bill for the construction of the railroad was brought before Parliament, it was contended that at that deep level no vibration would be felt at the surface. So far there appears to be no apparent reason for this extraordinary development, but until it has been thoroughly investigated, all other projects for similar railways will remain in abeyance.

Engineering Notes.

Five submarine boats of the Holland type are called for by the English naval estimates. Lord Selborne, First Lord of the Admiralty, states that their future value in naval warfare can only be a matter of conjecture. The first is to be delivered in the autumn.

The mysterious obstruction of Cape Thoms, Brazil, in 35 fathoms of water, which is placed on the British and American admiralty charts as a rock, turns out to be a large vessel, bottom up, held in position by her anchors and at times submerged.

Dr. Ludwig Mond has discovered a method for producing illuminating gas and coal gas at an expense of four cents per thousand feet. It is thought that this will effect a revolution by cheapening electric power, and it will also have an important bearing on the production of open-hearth steel.

There is a vast coal supply in Australia which is almost unworked as yet; the total product is so far about a million tons, and the larger part of this output has been from the Province of New South Wales. The resources of Victoria appear to be vastly greater. The Latrobe Valley produces lignite of good quality, and the supply is estimated at thirty billion tons. Shafts which have been sunk revealed beds 200 feet in thickness. It has been found that the Australian lignite was superior to the German in quality, and it also leaves less ash.

In the last maneuvers of the German army experiments were made with the acetylene light in optical telegraphy. Up to the present night messages and signals have been transmitted by means of the lime light. Acetylene, mingled with a certain amount of oxygen, was found to give a candle power three times greater than that of the lime light. By its means signals could be flashed by day to a distance of five miles and by night to a distance of ten miles. The simplicity of the apparatus employed in generating the gas is likewise noteworthy. Hitherto the signal corps has been compelled to transport the necessary oxygen in heavy cylinders. For the acetylene light oxygen is generated in fifteen minutes by means of a small retort and stored in a gas-bag.

A contract has been made for six new turbines by the Niagara Falls Power Company with the I. P. Morris Company, of Philadelphia. These new turbines will each have a capacity of 5,000 horse power, and will be built after plans prepared by Escher, Wyss & Co., of Zurich, Switzerland. Dr. Coleman Sellers, chief engineer of the Niagara Falls Power Company, and William A. Brackenridge, resident engineer of the same company, went to Geneva, Switzerland, about a year ago, and on their return the Niagara Falls Power Company invited competitive plans from Escher, Wyss & Co., the result of which is that their plans have been accepted, and the new turbines will be built after their design. The turbines installed in the present wheel-pit were designed by Piccard, Pictet & Co., of Geneva, Switzerland. The new turbines will differ considerably from the wheels now in use, principally in having the guides and buckets inclosed in the wheel case and having draft tubes which will allow the utilization of the full head of water available. The new turbines will be delivered about next August, and will be used to drive the six generators ordered in November last from the General Electric Company.

The construction of the Tehuantepec Railway and the harbor improvements at Coatzacoalcos and Salina Cruz, respectively, are proceeding apace. Mr. W. D. Pearson, the principal of the well-known British firm of contractors who are carrying out the work, has recently published an account of the work and the scope of the enterprise when completed. There is no doubt but that this new and practical pathway between the Atlantic and Pacific Oceans offers a serious menace to the Nicaraguan Canal. This firm of contractors have obtained a lease of the railway for 50 years. It is about 190 miles in length and crosses Mexico at its narrowest point. It was constructed some years ago by the Mexican government, but fell into partial disuse owing to its inferior construction and to the absence of terminal facilities for the shipping. Harbors, however, are now in course of erection with adequate wharves and quays equipped with the latest labor-saving machinery for the rapid loading and unloading of the vessels. Merchandise landed at one port will be unloaded, transported across the isthmus and reloaded at the other port at an inclusive cost not exceeding $2.50 to $3 per ton. The present carrying capacity of the Panama route is about 300,000 tons per annum, but it is anticipated that the lower rates, improved facilities, and better accommodation of this new route will divert the traffic thereto. The distance from New York to San Francisco by this new route will be about 700 miles shorter than by the Nicaragua Canal, and 1,100 miles less than by the present Panama road, while the advantage from New Orleans to San Francisco will be 1,600 miles over Panama. By this means the west coast will be brought within a much closer distance of the east coast.