THE NORTH ATLANTIC TELEGRAPH LINE.

Our countryman, Col. T. P. Shaffner, has been astonishing the *douce* people of Glasgow, Scotland, with his enterprise and adventures in the northern seas and Greenland. It is well known that Col. Shaffner has obtained a charter from the King of Denmark to run a telegraph line through Greenland (part of the way) and to occupy Iceland as a station for his proposed telegraph route of several short cables to avoid a long submarine circuit. To determine the practical character of his northern route, he chartered a vessel—the *Wyman*—and, with a competent crew, went on a survey in August last. He has accomplished his object, and has arrived in the Scottish commercial metropolis, where, on the 28th of November, he delivered a lecture on his adventures, before a very large audience in the Merchants' Hall of Glasgow. We will condense the leading features of his lecture which has been reported very fully in the *Herald* of that city.

Col. Shaffner was introduced to the audience by the Dean of Guild, who paid him a very high compliment for his enterprise and daring. The lecturer stated he had no pecuniary object in view; his aim was to communicate personal knowledge of the subject. In 1853, he commenced to devote his energies to the construction of a telegraph line between Europe and America. "In the latter part of 1853," said he, "I commenced to advocate the practicability of laying a cable in the ocean. That was the first point for consideration—Was it possible to lay a cable in the deep sea? The next was—Was it practicable to *work* a cable in the deep sea? The latter I admitted; the first was a point of discussion. I dared not venture my reputation as a telegrapher, at that time, to deal heavily with the question. I had no doubt of the practicability of laying a submarine electric cable on the bottom of the ocean, and I had to fight for that point. Telegraphers assailed me in every direction in regard to it—so much so that the most prominent gentlemen engaged in the telegraphing at that time, made such a remark as this (as will be found in the American prints): 'Would Mr. Shaffner risk a cable, such as we find necessary to span inland waters a mile in length, where they have a soft sandy bottom, as is usually found, to the caprice and unknown powers of the ocean, where the heaviest cable would float, without gravity, to reach the ocean's bed?' Such was the opinion entertained at that time by telegraphers in America. I can find no report of scientific telegraphers advocating that the measure was practicable. About the same time, and after satisfying my friends, that it was possible to lay a cable at the bottom of the sea, arose a philosophical question denominated among telegraphers the 'retardation of the electric current' in sub-aqueous conductors—that is to say, that when a current of electricity is transmitted through a wire in a submarine cable, there is a power in nature which arrests that current which you propose to transmit; hence it requires more or less time for it to get to its termination. On air lines we have nothing of that kind."

When Faraday then discovered that a submarine cable became like a long Leyden jar, Col. Shaffner was perfectly convinced that a telegraph cable between Newfoundland and Ireland was impracticable for commercial purposes; and in 1854 he visited Europe for the express purpose of satisfying himself of the correctness of his views; and the Atlantic cable has since that time more than confirmed them. He early advocated a northern route, but he was ridiculed for advancing such opinions. People said that icebergs and currents would sweep away the best cable that could possibly be laid. To remove such opinions was the object of his late researches in the northern seas; and on the 29th of August, 1859, he left Boston, provided with very perfect apparatuses both for surveying and sounding, and proceeded northward through Belleisle Straits to the coast of Labrador, where he explored various inlets and bays, and came to the conclusion that the best starting point for the cable would be between the 54th and 55th degrees of north latitude. From thence he shaped his course to Greenland, a distance of about 500 miles, and found that the greatest depth was 2,000 fathoms. The bottom gradually sinks as it recedes from the west, until about 100 miles from Labrador, where it is found at 1840 fathoms. After this a basis of nearly the same depth succeeds, until within 80 miles or so of the Greenland coast, when it sinks to 2,000 fathoms, and from thence rises somewhat abruptly. The ascent, however, does not terminate at the coast line, but continues up the *fjords* or bays, o. which there are several along the coast. These *fjords* are, in fact, exceedingly numerous all along the Greenland shores, extending even as far as 50 miles inland, and are never frozen. Having finished his sounding operations, Col. Shaffner next proceeded to examine the coast as far north as 63 degrees, and then struck out for the interior, in order practically to ascertain how far the country was adapted for laying the wires, and came to the conclusion that the thing could be done without the great destructive effect which it was hitherto supposed would ensue from the frost. He penetrated into the interior, and found the climate far milder than he expected. During the sojourn of the exploring party in Greenland, they were most hospitably received at all the places they visited; illuminations even, in some places, having been got up in honor of their arrival. After surveying the southern coasts of the country, they proceeded to the east, which is of a similar character to the west. From thence the bottom makes an abrupt descent at rather over the angle of 45 degrees until a short distance from shore, whence there is much more gradual ascent until Iceland, 200 miles off is reached. The remainder of the voyage showed 800 to 1,000 fathoms' depth from this island past the Faroes to Cape Wrath, in Sutherlandshire; the submersion of the cable being 272 and 200 miles respectively.

Col. Shaffner concluded his lecture by showing a number of Esquimaux curiosities, and a hearty vote of thanks was accorded to him by the meeting.

FRANKLINITE METAL.

Our attention has been directed by two correspondents to an article on the above subject, published on page 398, Vol. I. (new series) of the SCIENTIFIC AMERICAN, which we copied from and credited to the "New American Cyclopedia." We are informed that a number of the statements in that article are incorrect, and proof is furnished us to confirm the veracity of the objections made to their reliability. We will point out the statements and ideas to which the objections refer, and then present the evidence against them.

First: In the article referred to, the credit of first successfully working the Franklinite ore with anthracite is given to Mr. E. Post, of Stanhope, N. J., and Mr. C. E. Detmold, of the New Jersey Zinc Company; and the idea conveyed is, that Mr. Post is the inventor of the method.

Second: It is also stated that the Franklinite ore at Mine Hill, N. J., is so unfit for metallurgical purposes that attempts to smelt it were unsuccessful and the works abandoned.

In answer to the first paragraph, as a correction, we are informed that the experiments undertaken at Stanhope were projected by Mr. Thaddeus Selleck, of Winchester, Conn., who was engaged for this purpose by the Zinc Company at Newark, N. J., and that he is the inventor of the process whereby the Franklinite ore was first smelted successfully to obtain the metal. He was granted a patent for this invention on Jan. 30, 1855, and it was issued after a severe contest in the Patent Office. He produced ample testimony regarding the originality of the invention. We have examined this patent, and the claim is for the process of reducing Franklinite ore to obtain iron and the white oxyd of zinc by working it under a light head in a vertical walled, low cupola furnace.

The furnace described in the "Cyclopedia," which is now employed for smelting the Franklinite, is stated to be 18 feet high. This is a "light head," as the common iron furnaces are about 40 feet high; it therefore embraces the leading idea in Mr. Selleck's patent. The drawing in the patent represents a low cupola furnace with a dome-shaped top, and it has oblique air channels near the upper surface of the charge for injecting air into the top of the fire to produce perfect combustion by uniting with the carbonic oxyd, This arrangement also furnishes oxygen for the zinc; a more intense heat is the result, and the furnace never chokes up at the mouth. We are told that this furnace and process were perfectly successful, excepting in one feature, viz.: the oxyd of zinc produced was a beautiful durable yellow instead of a white paint. The reduction of the ferruginous part of the ore to metal was all that could be expected, and it was the "light head" of the furnace which secured the desired results.

We have only to state, in regard to the second statement referred to, that the smelting of the ore at Mine Hill was as successful as could be expected; and it was not on account of the ores that the works were abandoned, but difficulties in the company owning the mine. The ore is capable of producing a good Franklinite metal with a properly constructed furnace.

The pig metal obtained by the smelting of Franklinite ore is very different from pig iron; it has the qualities of a peculiar alloy. In color it is much whiter than iron, and when cold, it is much harder; in this respect it resembles steel and specula metal. It melts at a much lower temperature than iron, and it flows something like tin. Thus, take a piece of this metal, and put some borax on a piece of iron, and lay the Franklinite on the top of this; put it into a blacksmith's fire and it will melt, flow over it, and adhere to the iron more firmly than any two pieces of metal brazed together. Mr. Selleck obtained a patent on July 5, 1859, for coating the surfaces of iron with Franklinite metal in this manner. Applied to the sharp heel-pieces of horse-shoes it forms a durable thin sharp edge, as it is harder than the iron; and as the latter wears faster, the heel "corks" never grow dull, as in common horse-shoes. The Franklinite metal may also be thus brazed on faggots of iron and rolled out into plates, so as to leave a very hard surface that will protect the iron from rusting so rapidly, and at the same time add to its strength. Iron plates thus made may be superior to the thin steel plates which are now coming into use in England in shipbuilding; but it will require experiments to determine this, and we earnestly suggest that they be made. If successful, it will be of great benefit to this country, because the Franklinite ore is exclusively American—all that has yet been found in other parts of the world is not worth mentioning. It alloys with copper, welds with iron, and is adapted for coating the treads of wheels, the tops of rails and the edges of tools. About 5 lbs. of Franklinite metal smelted in a crucible (in the usual manner) with 100 lbs. of wrought iron will make very good steel. This peculiar metal deserves more public attention than it has yet received.

WATER PURIFIED FROM LEAD.

In answer to the inquiries addressed by the British Trinity House Board to Professor Faraday, relative to the sanatory condition of the water used by lighthouse-keepers, and the best methods of purifying the same, so as to be fit for drinking and cooking purposes, the professor remarks:—"As lighthouses are often of necessity placed in situations where water is obtained with difficulty, those who keep them are frequently dependent, more or less, upon that which is gathered from rain falling upon the leaden roofs, galleries, and gutters of the towers and cottages occupied as dwellings, Now, the salt of the sea spray, which often reaches these roofs, &c., even when they are half a mile or more from the shore, causes the rain water which falls upon them to dissolve a portion of the lead, which is larger or smaller under different circumstances, and at times rises up to a quantity injurious to health and poisonous. The water thus contaminated by lead, or rather chloride of lead, is peculiar in this, that it does not lose the poisoning substances either by boiling or by exposure to air, for the metal remains soluble after one or both of these processes."

He has ascertained that if a little whiting or pulverized chalk (carbonate of lime) were added to such water, and the whole shaken or stirred together, the lead immediately assumed the insoluble state; so that when the water was either filtered or left to settle, the clear fluid was obtained in a perfectly pure and salubrious condition. The process of purification is therefore exceedingly simple, for if some powdered chalk or whiting is put into the cistern in which rain water is collected, and stirred up occasionally after rain, the water may, with the greatest facility, be obtained in a state fit for all culinary and domestic purposes.

OPTICAL INSTRUMENTS.—In reply to everyday inquiries on this subject, we would inform our correspondents that H. Shlarbaum & Co., No. 300 Broadway, this city, are manufacturers and have an assortment of optical instruments, thermometers, barometers, small steam and electric engines, for experimental purposes, &c., which we believe they sell quite as low as any other dealers in their line.