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THE ATLANTIC TELEGRAPH—ITS PRESENT AND PROBABLE USES,

The last laid Atlantic cable has been in successful operation about two months. It has, as yet, shown no diminution of its conducting power, and the recovery and employment of the lost cable serves to give additional hope that the permanency of telegraph communication with the old continent can be assured. Now, the question arises, why cannot two cables be laid at the same time, instead of confining the work to the laying of one? Or why not lay a cable containing a number of conductors? In our issue of Aug. 4th, we gave engravings of a cable composed mainly of copper and an insulating material, which, the inventor claimed, was capable of transmitting six messages simultaneously. It may be that this plan in practice would be inefficient, but possibly some plan on a similar principle might be devised, by which the laying of one cable would insure the connection of the two continents by several independent conductors. If this is impracticable, is it not possible to lay two cables lighter than the present one, but possessing sufficient strength for service, so that the *Great Eastern* might take on board the double line and deposit both at the same time? We believe the project is feasible and within the resources of science.

The influence of the present telegraphic communication with Europe may not be, as yet, sufficiently marked to enable us to judge fairly of its future possibilities; but it is certain that it has already given a confidence to our business transactions and imparted a healthy tone to our commercial relations. Certainty has taken the place of conjecture, and diminished the opportunities for and discouraged the attempts at wild speculation, while, at the same time, it has aided the legitimate efforts of business men on both sides of the Atlantic. As the use of the telegraph becomes more general, by a reduction of the tariff rates, and by the facilities of communication afforded by a double line, we may expect increased life and energy will be infused into our trade.

In the diplomatic relations between this country and the nations of Europe the telegraph is destined, we think, to play an important part. By its mistakes can be rectified, misunderstandings corrected, and unpleasant complications avoided.

Occurrences trifling and unimportant in themselves, are often made by journalists the means of

exciting the passions and arousing the prejudices of the people. The European mails bring us accounts of speeches, and of the action of Parliament, the opinions of influential men and the intentions of those in authority, which are sometimes misleading and erroneous, the error being strengthened by editorial remarks in prominent journals. Before the next mail arrival the subject has been debated and discussed in the journals all over the country, passions inflamed, antipathies renewed, and the public mind put into a ferment. The telegraph, in such a case, will prove a ready means of correcting false impressions before they have taken root in the popular mind.

But with this pleasing aspect of the matter comes another of grave import. Both termini of the cable are on English territory. In case of a hostile feeling between the United States and England, she could cut off the communication between this Government and its agents in Europe, while at the same time she would be in almost instantaneous communication with her vast naval and military depots and arsenals on our coast and frontier, as Halifax, Bermuda, and Quebec. Still, in case of war we might easily raise and cut the cable, so that England could derive no benefit from it which she denied to us. There may be, therefore, no reason for anticipating national danger from the cable, but much for believing that the cause of civilization and the advancement of the whole human family will result from its success.

PROGRESS OF THE PACIFIC RAILROAD.

On the first of September the Pacific Railroad was completed from Omaha City to beyond Fort Kearney, in Nebraska, a distance of over two hundred miles. The rate of progression is from forty-five to fifty miles a month, so that it is believed that another year will stretch the road to the Rocky Mountains. The route is from Omaha City, along the banks of the Platte river, the same course traveled by the pony express. The surface of the country is highly favorable to the work, being smooth, hard, dry, and almost level. A better road-bed could not be desired. The graders are at work along the third hundred miles, and will finish the fourth this fall.

At the other end the work is progressing rapidly—a work that will be considered one of the monuments of man's perseverance and industry. We have before alluded to the immense difficulties to be overcome in the construction of the road through and over the Sierras, and the success in surmounting them. To exaggerate the importance of this trans-continental highway is almost impossible. To a certain extent it will change the relative positions of this country, Europe, and Asia. The track of an army is a track of desolation. Its passage impoverishes and scorches the country through which it moves. Not so the track of commerce. That country which stands between the place of production and the mart of sale, which is the highway over which the wealth of nations must travel, enjoys a Danaan shower. This was the secret of the prosperity of Palmyra, the city over which the proud Zenobia reigned—it built Alexandria, sustained Carthage, and made Venice the strongest republic of the world.

With the completion of the Pacific Railroad, instead of receiving our goods from India, China, Japan, and the "Isles of the Sea," by way of London and Liverpool, we shall bring them direct by way of the Sandwich Islands and the railroad, and become the carriers, to a great extent, for Europe. But this is but a portion of the advantages of this work. Our western mountains are almost literally mountains of gold and silver. In them the Arabian fable of Aladdin is realized. To-day it costs almost a competence to reach them, and live among them for a year or two, until the labors of those weary months begin to make a visible return. Food, clothing, machinery, implements, and all other necessities are costly in the mining regions of Colorado, Nevada, and Arizona. This cost is largely that of transportation. Let the road be completed, and the comforts as well as the necessities furnished by Asia, the manufactures of Europe, and the productions of the States, can be brought by the iron horse almost to the miner's door, and in the production and possession of the precious metals, the blood of commerce, we shall be the richest nation on the globe.

But the substantial wealth created by the improvement of the soil and the development of the resources of the country is a still more important element in the results of this vast work. Ease of access, facility of intercommunication, and encouragement to travel, will invite thousands of the crowded inhabitants of Europe and our Eastern cities, and build up towns and cities, and make luxuriant farms where now nature exists in almost undisturbed wildness.

COAL, ITS ORIGIN AND NATURE.

There can be no reasonable doubt that all coals, bituminous and anthracite, are of vegetable origin. By a powerful microscope the vegetable texture of the mass can be distinguished, not only in the softer qualities, but even in the hardest anthracite. We have seen specimens of indubitable jet yield to the power of the microscope and reveal the original grain of the wood or vegetable fiber. Peat is the first combustible form of coal, and if our peat beds, now sought after with so much avidity, and judged to be such mines of wealth, were suffered to remain undisturbed, they would, at some future period, become beds of coal for warming and lighting the winters and nights of future generations.

Coal is not a material belonging exclusively to past geological periods, but is in process of formation now, as may be proved by an examination of the "brown coal," well known in Europe and frequently met with here. Thin slices, which allow the light to pass through them, show to the naked eye the original vegetable structure. It is universally acknowledged that this "brown coal," or lignite, is an undeveloped coal, not yet subjected to the changes of years which would transform it into pure bituminous or anthracite coal. To be sure, time is required to change the disintegrated porous mass of vegetable fibers, roots, and tendrils, leaves and *lignum* to hard, brilliant, laminated, or crystallized coal. But nature works slowly. We find it difficult to understand her processes or to comprehend her infinite patience, which watches through unnumbered years and countless ages for the slow and gradual progression of her agencies. But it is certain that her transforming processes have not suffered an abatement of their original power by the discoveries of man. They still go on, and will as long as this globe and the universe endure.

It is possible that the present *furor* about peat will lead to the discovery of accelerating the action of unaided natural forces, so that this material may be made to give out as much heat-power as the concentrated coal, but we much doubt it. The principal fault with our coal is, that it combines with its elements deleterious to iron, whether in a state of fusion or merely subjected temporarily to its heat. Stoves, for instance, which are constructed to burn wood only, will last a life time or longer; but burn anthracite coal and the parts warp, and crack, and oxidize, until the stove, or that portion exposed to the direct action of the heat, must be renewed yearly, if not oftener. With the bituminous coal it is worse still. The grate, with a hot fire, yields and falls in pellicles, melted from the mass, until, in a short time, the most important portions of the contrivance are useless. To withstand the concentrated heat they must be made of extraordinary thickness.

In reducing ores, also, and especially in fusing iron, these components of coal are the cause of much trouble. They are foreign bodies, which have become incorporated with the original vegetable mass, and hold, chemically or mechanically suspended, sulphur, silicon, and other elements, which are detrimental to the metal.

There is no reason to disbelieve that all varieties of coal have a common origin. They are vegetable masses, which, mixed with inorganic particles, have undergone different degrees of mineralization, the more recent still retaining much of the volatile elements, the bituminous less, and the anthracite still less, until this will burn with but little flame and no smoke.

DURING the last ten years the value of the industrial products of Massachusetts has increased seventy-two per cent; the population during the same time, only three per cent.