

Scientific American.

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The Great Trans-Atlantic Telegraph.

While the pen is inscribing these lines the cable by which it is hoped to connect the wealth of the Old World with the enterprise and vigor of the New, is probably being rapidly reeled off and allowed to sink on the dark bottom of the Atlantic. It is probable that before the slow progress of the mails can deliver these sheets to a majority of our readers, the general result of the effort will be known and circulated on the wings of lightning to the furthest limits now reached by this great agent of intelligence. If the enterprise proves successful, and if signals are made with the force, certainty and speed requisite for the transmission of dispatches, the event should be celebrated by rejoicings, compared with which the *fetes* in memory of the old Roman victories should sink into absolute insignificance. It is a victory over immense natural difficulties, a leaping over space, an annihilation of time, a defiant trespass on the terrific depths of the ocean; a real practical triumph, and one which should, as it undoubtedly will, mark an era in the progress of the world, leading directly and indirectly to consequences which it is at present impossible even dimly to foreshadow.

But our hopes of its present complete success have been weakened by the several latest developments, until they have reached a condition of extreme tenuity. The construction and laying of the cable is an enterprise of immense magnitude, and either in consequence of too much or too little brains, and the presence of too many or too few advisers, the preparations do not seem to have been made in a manner which inspires us with much confidence. There are foremen of foundries in our large mechanical establishments, who, when a mold for a large and intricate casting is approaching completion, examine all the parts and the condition of all the materials over and over again with a carefulness which to the uninitiated seems to border on foolishness; then, when the moment for pouring arrives, with the glowing reservoirs filled with the burning metal, they stand cool, firm, slightly pale, but with every faculty at command, and with tools for every conceivable emergency in their proper places, conscious that so far as ordinary foresight could provide, they are ready for the crisis. There are engineers who appreciate the importance of the mammoth bridges they build, and builders who understand the vessels they construct; but judging by the past, the art of constructing submarine telegraphs has rarely as yet fallen into the hands of one of this class of earnest men, and in the preparations for laying this mammoth telegraph in particular, one of the simplest and most puerile blunders seems to have been committed and allowed to exist undetected until the whole was finished.

We allude to the fact that the two halves of the cable, having been made by two rival manufacturers at distant localities, are twisted in opposite directions, so that at and near the point of juncture, the tendency of the necessarily great strain incident to laying it will be to induce the untwisting of both. In consequence of this or some other considerations not yet distinctly explained, the plan of commencing in mid-ocean and stretching the line in each direction therefrom, has, after some wavering, been finally abandoned, and at last accounts the whole fleet was to sail in company from the coast of Ireland on the 3d or 4th of August, laying the cable as they move along. If it was ever important to avoid the possibility of mischance in consequence of the vessels becoming separated, as also to avoid the possibility of delay in uniting the ends and of compelling the slender thread to hold its weight for a considerable time in mid-ocean, as also to avoid the possibility of shocks and jerks in changing from one vessel to another, all of which the original scheme seemed to provide for, we see no good cause why those reasons do not now exist

with the same force. The economy of time in laying the line from two vessels instead of one is certainly as important now as it ever was, for the season has advanced further than was intended before the laying was commenced. It was reported some weeks ago that there was a possibility that the effort might be postponed till next season on account of the fear of autumn storms, and the adoption of this slower system of laying seems very feebly adapted to diminish the liability that the job may extend into September. The gentlemen at the office of the company in this city estimate that the laying will occupy only eighteen or twenty days, so that the fleet should arrive on the coast of Newfoundland by the 23d.

The reverse twist is a single point which leads us to believe that the whole affair has been and will continue to be bunglingly managed. Means have been provided for loading the junction of the two parts in such manner as to provide against untwisting in its descent but fear is expressed that the machinery for paying out the cable is too stout and not sufficiently sensitive to slight strains, so that the degree of tension on the delicate cord will be but feebly indicated. We hope to record the triumph of this experiment; we hope, in common with the millions around us, to enjoy the luxury of foreign news received the same day, and even apparently some hours *before* the events which it reports take place, but our hope strongly partakes of the character with which we hope for the success of a flying machine. It is possible but not probable. If successful in extending across and conveying signals, we shall not cavil at the question of its durability, but consider it a triumph worthy of immortalizing the names of the parties whose wealth and enterprise have carried it forward.

Serious Injuries Little Felt.

It is not generally known how little pain is sometimes caused by a very serious accident. The unconsciousness of the sufferer with regard to the extent of the damage, is probably due in part to the fact that there are comparatively very few nerves within the system, but a very sensitive net-work extended over the surface; and in part to a benumbing of the injured portion. The latter alone can be made available to explain the fact that men have often felt little or no inconvenience for a considerable period when fatally scalded. We see it reported that during the recent riots in this city, a man received a bullet in his side, and remained in utter ignorance of his wounded condition for nearly three-quarters of an hour. He walked some distance through the streets, turning several corners, and finally took one of the Eighth avenue cars, and it was not until the car stopped and he attempted to rise and take his departure that he discovered that he was shot. He was assisted to his home, and there attended by a physician, but subsequently died from hemorrhage produced by the wound.

The Harrisburg Telegraph details another case, in some respects more singular than this, but which, at last accounts, had not terminated fatally. It appears that a few nights since, a canal boatman named Tomach, while asleep on the deck of his boat, came in collision with a bridge near Highspire, Pa., which struck him on the back part of the head, knocking therefrom a parietal bone which was found shortly after as free from extraneous substances as if it had been extracted by the hands of a demonstrator of anatomy. The wounded man was, of course, instantly aroused by the concussion, and what is most remarkable, rose to his feet, perfectly unconscious of the extent of the injuries he had received by the collision. The slight pain in the back of the head gave no trouble whatever. It was only after he had dressed himself and one of his comrades had found the bone on deck, that he was made aware of the unfortunate mutilation of his caput. After this discovery, the wounded man was taken to Highspire, where a surgeon was summoned, who, after washing the brain, replacing the parts, and arranging the splinters of the adjacent parts of the skull in a proper manner, informed him that was all he could do for him. With this the wounded man departed,

in a perfectly rational state, to his home at Loyalsock.

Copper in the Sea.

Some five years ago, two French chemists demonstrated that the ocean contained a notable portion of silver. Recently these and other philosophers have again been at work upon the same subject; following it up, however, much closer, they now tell us that, calculating the whole ocean, it cannot contain less than two millions of tons of silver in solution. The truth of this statement is verified by experiments tried at various parts of the world—one more famous than the rest by Mr. Field, an English chemist, who lives at Coquimbo, in Chili. The water he analyzed was taken from the Pacific Ocean, and afforded the same result as that which the French chemists obtained from water taken off St. Malo, France, in the English Channel. That the ocean should contain minute portions of every substance of the globe that is soluble in saline water is not surprising; therefore we are, in a measure, prepared for the further discovery that the "old grey beard," ocean, contains also an enormous quantity of copper—a fact recently proved in the laboratory of our London contributor, Mr. Septimus Piesse. The beautiful blue color of portions of the Mediterranean Sea is due, he says, to an ammoniacal salt of copper, while the greenness of other seas is owing to the chloride of copper. The method of extracting silver from the sea is one of simple affinity. Granulated copper being suspended in the "briny waves," any silver salt that is contained therein is decomposed, a portion of the copper is dissolved, and the silver is precipitated thereon, from which it is afterwards parted by the usual means adopted in every laboratory.—By a happy analogy, Mr. Piesse separated copper from the sea by the same process. His experiments were performed between the ports of Marseilles, on the French Mediterranean coast, and Nice, in Sardinia. A bag of nails and scrap iron was suspended at the side of the steamer which plies between these places, and after the first voyage (about twelve hours), copper was indicated to be present on the iron. Four separate voyages, however, were made before the bag of iron was removed to the laboratory; then the quantity of copper was found to be so great that much surprise was shown that the presence of this metal had not been previously discovered, especially when the action of sea water on ships' bottoms has long been known.

Mr. Piesse is continuing his experiments, and we shall not fail to notice what is going on in his laboratory, concerning this singular and wonderful discovery.

Iron in California.

It would really seem that there is no limit to the mineral resources of this highly favored region, which but a very few years ago was an obscure province of Mexico, valuable only for its exports of dried hides.

By the last steamer we received a letter from Jos. P. Paxson, of San Francisco, in which he informs us that within a few days there has been discovered a large bed of iron ore in Placer county, and the specimens which he had examined seemed to be almost solid iron.

"It lies," says the Press, "in vast quantities upon the surface of the earth, and an immense amount of it can be obtained with no further trouble than picking it up and loading it into wagons. It has been tested and found to contain eighty-three per cent of pure iron. Mr. Lovell, (of Auburn,) the owner, has commenced operations upon it. He passed through town on Thursday last with two wagon loads of the ore destined for shipment to San Francisco. We understand that he has contracted for the delivery of a large amount of it to a San Francisco foundry. This is indeed a most important accession to the list of our mineral resources; and should the railroad be extended to this place, so as to reduce the present high rates of transportation, Mr. Lovell's iron mine will be more valuable than any gold mine in the county."

The same paper asserts that Placer county is unequalled by any other in the State, in the extent of her mining districts, the rich-

ness of her mines, or the variety of her minerals. In Green Valley, copper is found in abundance and in great purity all over the hill sides.

If this iron ore can be worked economically, it will be a most important addition to the mineral wealth of the Golden State.

United States Coast Survey.

The great work of surveying and mapping, with all the accuracy afforded by the best modern improvements and processes, the whole coast of the United States, continues to be pushed vigorously forward, the surveying parties being now principally employed on the extreme Eastern coast. The steamer *Corwin* and the surveying schooners *Meredith*, *Hassler*, and *Gallatin* are employed at different points on the coast of Maine; and Prof. Bache, the Superintendent, with the main party, was at last accounts constructing a level, straight road, and measuring a base line at Columbia, in the same State. Few readers may be aware of the great accuracy required and attained in this measurement of a base line. The most of the measures in the survey are taken by triangulation with large and exceedingly accurate instruments, which, mounted on hills, take the bearings of other points, and from comparing the angles, in observations many times repeated, with the instruments reversed and varied to avoid all possible sources of error, the relative distances are ascertained with great accuracy. But, in order to obtain the actual distance between each point in miles, feet and inches, some one of the various lines must be accurately measured, and the process of measuring such base line as it is termed, only six or eight miles in length, frequently employs a gang many weeks or even months. The accuracy is such that a disagreement of three quarters of an inch between two such measurements is esteemed a quite sensible error.

Scientific Association.

The American Association for the Advancement of Science met at Montreal on the 12th inst., but up to the time of our going to press we could find little in the reports, as they appear in the daily papers, which is suitable to condense for our columns. The indirect importance of the facts developed at these annual meetings is probably of considerable moment, but the practical and immediate importance of any portion has generally been extremely small. There have usually been some theories on steam and the like practical subjects which on a hasty reading seem absurd, and speculations on particular varieties of antediluvian oysters, or on microscopic plants found in Spitzbergen, and an adjournment. We shall examine the reports of this meeting with considerable care, and re-publish everything which appears to possess interest.

The New Volume.

We hope our friends everywhere are busy in the formation of Clubs for the New Volume of the SCIENTIFIC AMERICAN. The List of Premiums published on the last page of this number will no doubt attract attention, and we expect a largely increased list of new subscribers. We have never appealed in vain to our friends. Now let us have an increase of at least 10,000 subscribers on the new volume; and we promise our most strenuous exertions to make the SCIENTIFIC AMERICAN of increased interest and value to all. Our circulation has always steadily increased from year to year until it is now without an equal in its particular sphere.

Subscribers who began with the present volume will please to bear in mind that their subscriptions will expire with No. 52. We trust they will not only be prompt in renewing their subscriptions, but also ask their neighbors to club with them. Our terms offer great inducements for clubbing. See Prospectus.

Patent Right Exchange.

Messrs. Phillips & Parsons have established an agency for the sale of patents at Syracuse, N. Y. They are in the heart of the great Empire State, and ought to do well, as there is always a market for good improvements.