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## OCEAN TELEGRAPH LINES.

An international conference has lately been held in Paris, which was attended by representatives from several Governments, for the purpose of examining into the project of a new telegraphic line between Europe and America, by Arturo De Marcoartu, chief engineer of the Spanish corps, who has forwarded to us a short treatise on the subject. In this production its author discusses the merits of the several projected lines for establishing Atlantic ocean telegraphy. The new line is set forth as a universal telegraphic enterprise, not to be under the control of any particular Government, but to be cosmopolitan in its character, open to the people of all nations. It is proposed to commence the line at Cape St. Vincent in Spain and to reach America at Cape San Roque, Brazil, touching at several islands in the Atlantic, which are to form stations, and the whole oceanic line to consist of seven submarine cables of different lengths. It will start from Cadiz, run to the island of Madeira, 616 miles, next to the Canaries, by a section of cable 318 miles; thence to Cape Blanco, 533 miles; then to Cape Verde islands, 652 miles; next to Penedo de San Pedro, 1,009 miles, thence to Fernando Norona, 392 miles; and from that point to Cape San Roque, Brazil, 226 miles. The total length of line by this route will be 3,746 miles divided into seven sections of submarine cable. From Brazil it is proposed to extend the line to New York, by way of the West India islands and Cuba, with a line of six cables having a total length of 4,594 miles, thus making the entire line to New York from Europe 8,340 miles long.

It is undoubtedly much easier to work short than long submarine lines, and some of the intermediate stations on the proposed line are important positions, but compared with the line between Ireland and Newfoundland thence to New York, the expense of constructing it must be prodigious. The longest section of a cable required on this old route is 2,200 miles, while there are three sections of cable required by the new route, each of which exceeds 1,000 miles in length. If a cable can be laid and worked successfully between Ireland and Newfoundland, this will form the cheapest and most advantageous route. It is now known that the old Atlantic cable was defectively constructed, and it is asserted that, by recent improvements in the construction of cables and in apparatus for working them, no difficulty will be experienced in laying and operating the long line of 2,200 miles; therefore we hope it may soon be commenced and carried out with vigor and success. No person, however, can object to the objects endeavored to be secured by the newly-proposed line of M. De Marcoartu, namely, a universal enterprise of a cosmopolitan interest. We would like to see several ocean-telegraph lines established, if there were sufficient business to render them necessary and remunerative. Every commercial tie of this character which binds nations together exerts a beneficial influence.

There are forty-five submarine telegraph cables in operation. The first was laid between England and France, a distance of 25 miles, in 1851, and has thus been twelve years in operation. The longest, between Malta and Alexandria, is 1,535 miles long and has been in operation about one and a half years. The success of this line affords a guarantee for the

proposed line between Ireland and America, which will require a cable of only 665 miles greater length, but the distance between the two shores is not quite seventeen hundred miles.

## ARE SCRAPED SURFACES INDISPENSABLE?

In stating this question as broadly as we have done, we disclaim at the outset any intention of dispensing utterly with scraped surfaces, or of erasing from the vocabulary of mechanical technicalities this detail of the workshop. The doubt has arisen in our mind whether much of the time and elaboration expended on scraping iron surfaces might not, without injury to the work itself, be omitted. The value of a positively correct face on a valve seat or on the V-shaped ribs of a slide lathe or planer, is undoubtedly great when it is well done, but when poorly executed the utility of it is, to say the least, questionable. We make the unqualified assertion that not one man in twenty is competent to finish a truly scraped surface. Scraping iron down to a perfect face is an art by itself, and comparatively little attention, so to speak, has been given to the subject in this country. The common method in use is to take an old file of any kind (except round or square), flatten its end out like a chisel, grind it up square on the stone, and then "grub" away on the iron wherever the workman sees fit. The chances are that previous experience has not fitted the operative for this branch of his business, and he mistakes a shade on the iron for a bearing and makes a depression still deeper by misapprehending the "situation." Of course the fallacy of attempting to make a true face in this way is manifest to every one familiar with the subject. It would have been far better to have saved the time wasted in such attempts and trust to good planing and attendance in future to rectify inaccuracies.

The better way to make a scraper is to form it like a Venetian stiletto, or, more familiarly, after the model of the section of a beech nut; that is, to have the blade triangular in section, and approaching concavity. With such an instrument, properly tempered, ground, and sharpened, the finest work can be produced. A flat-faced scraper is an abomination, and only fit to dig holes or to rough out the work for the triangular scraper; it is apt to make "chatters" in the surface, and when these occur we may bid a long farewell to any fine work without filing them out—a very pretty task to undertake after something like accuracy has been attained. Most scraped surfaces are nothing but a combination of scratches, shining blotches, and untruth; and while they are a waste of time to execute, they add nothing to the mechanical value of the work. We may fairly question whether valve-seats up to 180 square inches of area, say 15 inches by 12 inches, are benefited by scraping. In some locomotive-shops in this country it is the practice to plane the valve-seat so that the tool-marks on it run in one direction, and place the valve so that similar marks in it cross the seat at right angles, and to set the valves running in this way without further adjustment. The results observed are that in a few days the valve has made a seat for itself that is far more durable than if it had been badly scraped. We do not go so far as some persons and assert that a scraped valve-seat is a positive injury, inasmuch that the pores of the iron are filled with an impalpable dust that works out to the detriment of the engine in future; this theory is very finely drawn, although it may be partly sustained by facts. A finely-finished mirror-like surface on a valve-seat or lathe shears is indubitably of great value, and we must, in common justice, give credit to English workmen for great skill in this particular; in general they far excel our own workmen.

There is no reason whatever to interfere with the execution of a finely-elaborated scraped surface in our own shops; but our observation convinces us that time spent in doing such work as we have seen, might be better employed in some other way.

## RIFLE CLUBS.

If the present war has demonstrated anything it is the want of independent military organizations—independent, yet so far subordinate to the State Government that they can be mustered into service when the public weal demands it. The particular kind of

organization that we have in view in making this suggestion is a "rifle club." If we required precedent, as a nation, for taking such a step, or at least making the proposal, the example of the English, Swiss, and German nations may be cited in evidence of the popularity with which such a system is regarded abroad. Similar bodies of militia, so to speak, are also recruited in France, but they are by no means popular convocations, and are under the surveillance of the authorities. With a profound sense of the necessity which exists among ourselves for the recruiting and forming of such companies, we unite an earnest desire to see our suggestion acted upon without delay. Any person at all conversant with the history of the hour can readily perceive the inestimable value of such bodies of men and the practical use to which they could be put. Riflemen in particular are the most efficient infantry in the world when properly handled, and all generals take special care to guard against exposing their troops to their galling fire. Mechanics make the best riflemen in the world, as they do also the most versatile soldiers. The record of the war is full of instances wherein tradesmen have thrown down the musket, turned sappers and miners, completed their labors in this line, and then resumed their guns and fallen into the ranks again. They have been ready to attack the enemy either with spade or musket, and have skilfully and cheerfully performed labors, against time, that were not within the legitimate range of the particular corps to which they belonged. If these glorious achievements can be cited of those artisans now in the ranks, why can we not, in perfect confidence that our voice will be heeded, call upon other workmen still at home to organize bodies of riflemen, to form themselves into clubs of home-guards, and be willing to defend that home, either on its doorstep or 5,000 miles from it? Steady of hand, keen of vision, and stout of heart, no better materials than our mechanics can be found for the formation of a band of defenders, that shall be such in reality. In some instances military organizations have contented themselves with parades, holiday affairs, suppers, camping out in the woods of some watering-place in close proximity to a fine hotel, in short, doing everything except face the foe. We are confident that no such short-comings as these could be recorded against regiments of hard-fisted, stout-hearted workmen, and we urge them, in whatever State of the Union they may be, to take steps to form companies without delay, for at the present writing there is no prophecy when they may not be needed.

## A CAVALRY HELMET WANTED.

Any person who reads the reports of cavalry skirmishes and pitched battles, and knows the havoc created on both sides by the skillful use of the sabre, cannot but wonder that some light and efficient protection for the dragoon's head has not been proposed to the Government. We have had bullet-proof vests, which, in more than one instance, have saved the lives of the wearers. The principles involved in their construction should be carried out still further, and the head, as much the seat of vitality and energy as the heart, protected from assault, covert or open. Of course, we do not allude to any such ponderous affairs as Sir Brian Du Bois Guilbert wore in his tilts and tournaments, which weighed twenty pounds, more or less; but the sort of protective headgear we have in mind is a light steel plate set on an elastic skull-cap. Let the plate be conical in shape, hard enough to resist indentation, and then, armed and equipped with this, the enemy who should be rash enough to smite the wearer would be doubly foiled; his own arm would be lamed by the glancing and wasted force of his blow, and the helmeted trooper would also be unharmed. Such a helmet would be attacked instantly by the enemy until they found aggression useless; for the temptation to knock off a man's hat is always irresistible, especially if he has on one of a singular appearance. It would also add to the *tout ensemble* of a squadron if it was made bright and neat in appearance, and in many ways would be highly desirable. The helmet need not weigh as much as a fireman's hat and would be a most efficient protection. It would not only save the head, but in most cases would protect the shoulders from injury, as it would be difficult to deliver an undercut in a general *mélee* that would disable a