RAILWAYS OF THE WORLD.

There are 31,800 miles of railroads in the United States, of which there are 20,688.51 in the free and but 11,111.43 in the slave States. The total cost of the entire lines has been $1,192,302,015. Last year there were only 631 miles built, against a previous annual average of 2,000 miles. But although the construction of roads decreased, the traffic on all the northern roads was greater than on any previous year. The condition of our railroads is favorable at present.

The length of railways in operation in Great Britain and Ireland is 10,750 miles, 300 miles of which were built last year. Their entire cost of construction amounts to £355,000,000 (about $1,775,000,000). There are 5,801 locomotives, 15,076 passenger carriages and 180,574 freight cars used on these railways. Last year they carried 163,435,678 passengers, 60,000,000 tuns of minerals and 29,500,000 of general merchandise.

France has 6,147 miles of railway, worked by 3,000 locomotives; 3,500 miles of new lines are being constructed. Total cost of completed lines $922,200,000.

Prussia has 3,162 miles in operation; Austria 3,165 miles; the other German States have 3,239 miles; Spain has 1,450 miles; Italy, 1,350; Rome, 50; Russia, 1,289; Denmark, 262: Norway, 63; Sweden, 288; Belgium, 955; Holland, 308; Switzerland, 600; Portugal, 80; Turkey, 80; Egypt, 204.

In the British colonies, there are 1,408 in the East Indies; Canada, 1,826; New Brunswich, 175; Nova Scotia, 99; Victoria, 183; New South Wales, 125; Cape of Good Hope, 28. Making a total of 14,277 miles in operation in the British Empire; the entire cost of which has been $2,086,765,000.

In Mexico there are 20 miles of railway; Cuba, 500; New Grenada, 49½, (Panama Railway); Brazil, 111; Chili, 195; Peru, 50; Paraguay, 8.

The total length of railways in the world is 69,733 miles. Their estimate cost is about $5,877,200,000. Nearly one-half the length of lines belong to the United States; and one fourth to Great Britain and Colonies. The cost of the latter, however, is about twice that of our railroads.

We are indebted to the London *Engineer* for the statistics of foreign railways.

Why Do Men Carry Canes?

One of our exchanges thus discourses about canes:—Can anybody tell us why some men, sound in limbs and strong winded, are tied to canes? We know several persons, who, to all appearances, have no more need of a cane than a jackass has of a tuning fork, that, meet them where you will, their cane is a never absent companion. In some instances this article is several inches too short to be of any service, supposing the owner wanted it for support; in others it is too long; then again it is too weak, being a mere switch. Sometimes the cane is thick and heavy, and if the bearer happens to be a feeble-looking man his cane seems to be a burden to him. Young and middle-aged men, as often as those well advanced in years, use canes. Some go flourishing their sticks along, never once touching them to the ground; some carry them hugged up in their arms; some let them slide half way through their hands at every step, bouncing them on the sidewalk; some carry them as if ready to knock down an adversary; some drop them lightly to the ground, as if fearful of hurting their sticks, or that which came in contact with them; some go with the heads of their canes (especially if they are gold) bobbing about their mouths, particularly when they are still. Nobody, excepting the old or decrepit, knows why he carries a cane. The only use we can see for them is to beat off vicious dogs, if one is attacked; and we reckon people carry canes for the same reason that they snuff, smoke and chew—it is a habit they have acquired.

A PLAN has long been under consideration to open up a steam and water communication between the West and East, by connecting the waters of the Mediterranean and Red Sea. At present, it is said, there are 8,000 laborers employed in digging a canal across the Isthmus of Suez, in Egypt, for this purpose. If it should be completed and put into successful operation it would be of vast influence upon the commercial and political world.

Charcoal in Medicine and as a Disinfectant.

Charcoal powder has been for a long period a favorite remedy in America, the Indies, and in many parts of Europe, for dysentery, and it is extensively used, with success, as a remedy for nervous dyspepsia and other painful disorders of the stomach and bowels.

Dr. Beloc, Surgeon-Major in the French Army, says, in nervous affections of the stomach and bowels; in those complaints which are so prevalent, and attended with so much pain and inconvenience, but which do not confine the sufferers to their bed, such as weight and uneasiness after eating, nervousness from laborious digestion, dyspepsia, pain in the chest, waterbrash, &c.; for each of these disorders, the powder of charcoal is the most effectual in relieving pain, restoring the digestive powers, improving the appetite, and enabling the stomach to bear food. Some vegetable substances contain less than 75 per cent of carbon, the remaining 25 per cent consisting of earthy mineral and deleterious matter. Charcoal possesses the property of absorbing noxious gases. M. Lowitz, a German chemist, about the year 1789, first applied this substance for deodorization and purification. M. Theodore de Saussure, by a series of experiments, proved its power of altering the character of foul gases, by its peculiar properties. Mr. Turnbull, of Glasgow, in experimenting on the qualities of manure, covered 350 dead horses with charcoal, and no unpleasant odor was emitted from them. He also placed the body of a dog in a wooden box, for more than six months, in which he put a layer of charcoal, and covered it over with another layer, of a few inches in depth. The box was left uncovered in his laboratory, from which no offensive smell was ever discovered. The property of charcoal to restore sweetness to tainted meat was shown by Lowitz, when in St. Petersburg, in 1786.

Different Flour and Grain Markets.

In Chicago the flour of spring wheat is selling at from $3 75 to $4 per barrel; winter wheat flour at $4 25 to $4 65. Spring wheat ranges from 66 to 72½ cents per bushel; winter wheat at from 75 to 80 cents. Corn at from 18 to 20 cents. Rye at 33 and 34 cents. Barley at 35 and 40 cents. Oats 22 and 23 cents. In New York flour ranges from $5 50 to $7 25 per barrel. Genessee extra brands, Southern and Missouri brands bring the highest prices. Chicago flour is an inferior article to these high-priced brands. Virginia flour brings $7 25 per barrel. It is preferred by pastry bakers and for shipment to warm climates, as it contains less moisture than Northern flour. Any wheat flour, however, if kiln dried before being packed in barrels will keep as well in warm climates. Chicago spring wheat is selling in New York at from $1 29 to $1 33 per bushel, and winter wheat (red) at from $1 38 to $1 44. Northern rye is selling at from 83 to 85 cents; barley, 80 to 90 cents; oats, 40 to 42 cents; corn, 65 cents, mixed, to 86 cents, Southern white. Flour and grain have advanced in prices during the past week. The rise in flour has been 10 cents per barrel for all grades. The demand for export has greatly improved since the peaceful solution of the Mason and Slidell affair. Corn, rye and barley have gone up about two cents per bushel. From the 1st of January to the 21st, 955,615 bushels of wheat have been exported from New York, against 606,278 for the same period in 1861. Of corn, there has been exported 674,417 bushels, against 393,610 in the same period last year. Of wheat flour, exported, there are 221,390 barrels this year against 106,947 in the same time last year.

VICTORIA BRIDGE.—The Montreal *Advertizer* says heavy gates to close the tube of Victoria Bridge are in course of preparation; and a strong picket guard will be stationed at each entrance. When the gates are hung, they will be opened to allow the passage of trains, and immediately closed; and the doors of all passenger cars will be locked to prevent any person leaving them while passing through the tube. These precautions are taken to prevent the threatened blowing up of the tube.

THERE were 86 steamers built at Glasgow, Scotland, in 1861; their gross tunnage amounted to 62,875 tuns. At present their are 34 steamers being built at the same place, the tunnage of which will amount to 30,350 tuns.

Photographic Discoveries of M. Niepce de Saint Victor.

The Paris correspondent of the *Photographic News*, (London) thus alludes to the above distinguished French discoverer:—

The Tremont prize for 1861, has been unanimously awarded by the commission to M. Niepce de Saint Victor, in preference to the claims of other candidates, for the following reasons:—

The *debut* of M. Niepce de Saint Victor was very remarkable. The object of his first effort was to take copies of engravings or of designs in black on a white ground, by exposing these engravings or designs to the vapor of iodine. The iodine attaches itself to the black lines of the engraving, &c., and when the design so iodized is placed in contact with a sheet of starched paper, the lines of the engraving, &c., to unite in preference with the starch of the white paper.

M. Niepce gave a considerable impulse to photography by his application of iodized albumen to glass plates: when this film becomes dry, he immersed it in a solution of aceto-nitrate of silver, and then exposed it to the action of light in the camera. He thus obtained a negative proof from which any number of positives could be afterward taken on surfaces impregnated with substances sensitive to the influence of light.

M. Niepce demonstrated the remarkable fact that certain bodies receiving the rays of the sun, possess the faculty of afterward acting in the dark upon matters sensitive to light, as if the first bodies were themselves luminous, the sun communicating to them a power of action which they retain for entire months in the dark.

M. Niepce starting from the beautiful researches of M. Edmund Becquerel on the coloration of matters sensitive to light; also recognized a very remarkable action in chloride of lead, under the two-fold relation of the whiteness, and of the duration of the color of the image submitted to the influence of light. This discovery M. Niepce will soon lay before the Academy.

M. Niepce is an example of what a decided vocation can accomplish. Educated at the cavalry college of Saumur, he early made himself a name in science, by researches marked by originality; the academy always received them with sympathy, independently of the interest inspired by the author of them, then a stranger to every scientific body, and whose first researches, commenced at a distance from the capital, were successfully carried on in a barracks, amid the distractions of military duties, always faithfully performed. When M. Niepce generously abandoned his discoveries to the public, he never entertained the idea of deriving the least personal advantage from them, and he executed most of his researches at his own expense. Therefore the commission unanimously award him the Tremont prize of 1861.

Horses Falling in the Streets.

In a letter addressed to the Albany *Evening Journal*, from London, by Mr. Thurlow Weed, he says:—"But what surprises and perplexes me most, in the city, is the fact that while the great omnibus thoroughfares, Oxford street, Piccadilly, the Strand, Fleet street, Ludgate and Corn Hill, paved like Broadway, are generally wet and always slippery, the horses never, or very seldom fall!" The patent horse shoe, illustrated on page 224, Vol. II. (new series) SCIENTIFIC AMERICAN), if generally adopted would prevent horses falling in our streets or on the most slippery roads during winter, when snow and ice are upon the ground.

MAXIMS ON TIME.—Time is like a creditor, who allows an ample space to make up accounts, but is inexorable at last. Time is like a verb that can only be used in the present tense. Time, well employed, gives that health and vigor to the soul which rest and retirement afford to the body. Time never sits heavily on us but when it is badly employed. Time is a grateful friend; use it well, and it never fails to make a suitable requital.

THE ladies are introducing a new and beautiful ornament for the parlor mantel or centertable. They take large pine bars, sprinkle grass seed of any kind in them, and place them in pots of water. When the burs are soaked a few days, they close up in the form of solid cones, then the little spears of green grass begin to emerge from amongst the laminæ, forming an ornament of rare and simple beauty.

Rifled Small Bore Arms--Enfields Condemned.

The following interesting extracts on this important subject are from the *Army and Navy Gazette*, published in England :—

The late Lord Herbert, when Secretary for War, claimed a "ten years' life" for the Enfield rifle ; experience proves, however, that its longevity is even less than this, and practicians know full well that long ere that prescribed decade has run its course, the weapon, owing to an inherent susceptibility to the abrasion of the bullet and the frictional action of the ramrod, especially towards the muzzle, where the grooves are shallowest and barrel weakest, ceases to be a rifle in all save name. Thus it is notorious that even at Hythe School of Musketry, the Enfield rifles of 1853, and even of a more recent date, have had to be put aside as worn out and effete. Under such circumstances, the economy of continuing the manufacture of this description of rifle, and of its retention as a service arm, may well be called in question.

The trajectory of the Enfield is absurdly high. At great distances the bullet plunges, and the "dangerous space" is reduced to a few yards, thus necessitating an elaborate system of judging distances, the practical application of which is attended with doubtful results. But it is when put in the scale, and pitted against rifles which have emanated from the private gun-factories of this country—rifles which are made use of at every volunteer rifle-match, to the almost entire exclusion of their military rival—that we become thoroughly cognizant of the great inferiority of the Enfield rifle ; and the prevailing impression made on the mind is that of utter astonishment that we have so long remained satisfied with it as a military arm. Nor is this feeling diminished by learning that small arms on the Whitworth principle, which combines in so preëminent a degree durability of construction with lowness of trajectory, can be manufactured at Enfield factory at a slightly enhanced cost of some 5s. per rifle over the Enfield.

Last spring at Hythe, in presence of General Hay, Lord Elcho and Mr. H. Vivian, M. P., experiments were actually carried out with rifles thus constructed, the barrels being made of the ordinary welded Enfield gun metal, while the bore had the polygonal rifling of the Whitworth, when, contrary to all expectations, it was found that this pseudo-Whitworth actually fired with a slightly lower angle of elevation than the *bona fide* Whitworth itself, which had heretofore been supposed to possess an unapproachable superiority by virtue of the special character of the metal from which the barrel is made.

The Duke of Wellington, was obstinately wedded to "Brown Bess," with its large bore, and the longer he lived the firmer became his faith in the large bore, and the necessity of making a big hole in the enemy ; and so in our day, dogmatic optimists maintain that the Enfield rifle is "good enough," and gravely argue that the caliber of the Whitworth rifle—.45 of an inch—is too small, and that, in order to kill a man, a projectile must have a diameter of .577 of an inch. "They teach us how to split a hair," forgetful of *Mercutio's* significant exclamation on being congratulated on the smallness of what proved his death wound—"No! 'tis not so deep as a well, nor so wide as a church door ; but 'tis enough—'twill serve."

At Inkerman an Enfield bullet was known to pass through four Russians, and it is stated authentically that during the most critical period of the Indian mutiny, when time and ammunition were precious and rebel prisoners too abundant, it was found that the Enfield bullet was capable of penetrating through eight sepoys at one shot! Taking the former data, however, for the terms of our ratio, it still follows, by the simple application of the rule of three, that a Whitworth projectile would have penetrated the bodies of ten Russians, seriously wounding the eleventh! This will be more readily conceded on our quoting the result of experiments made at Hythe, in 1857, to test the comparative penetration of these missiles. On the occasion referred to "the Whitworth projectile, with the regulation charge of powder, went through 33 planks, and was brought up by a solid oak balk beyond, while the Enfield ball could not get past the 13th plank."

The other argument usually urged against the gradual adoption of a rifle with a smaller bore than that of the Enfield is that it would involve our having two sizes of ammunition in the service, but this objection cannot surely be seriously entertained, inasmuch as the evil, if such it can be called, would be merely of a temporary character ; moreover, the exception loses much of its force from the fact of our artillery having many different sizes of ammunition in use at one time.

We cannot but express regret, before quitting this subject, that the volunteers, who were expected by the regular service to originate so much of a progressive character as to weapons of war, should have contented themselves with the rifle of the private soldier, instead of making a strenuous effort to obtain a small-bore breech loader, with a trajectory so low and flat that the necessity of judging distance would have been destroyed, and the close advance of avalry on infantry rendered impossible.

Great Experiments with Heavy Guns and Iron Plates.

The London *Times* of December 29th contains the following account of a trial with a large target similar in every respect to a section of the side of the iron-plated frigate *Warrior* :—

The target was a perfection of the *Warrior's* broadside, twenty feet long and ten high, made by the Thames Iron Company, of exactly the same materials as the *Warrior* itself. This was erected at 200 yards' distance from a battery of six guns—two solid 63-pounders, three of Armstrong's 100-pounders, and one 120-pounder shunt gun. Every one knew before the experiments commenced that such a target would stand an immense amount of pounding, and the chief curiosity was evinced to see how the teak backing would support the plates, and, above all, how the rivets in the ribs would resist the tremendous concussion. No one, however, was prepared for the astounding success of the result that did ensue, and which showed itself at the close of the experiments, during which the target was subjected to every conceivable ordeal of artillery practice, yet survived comparatively uninjured, and practically as invulnerable as ever. The guns were fired in volleys of threes and fours and sixes simultaneously. Their shot were concentrated upon white spots painted on what were supposed to be the parts most likely to yield. On these the fire of the most tremendous missiles—100-pounders and 120-pounders and even 200-pounder bolts—were directed with a force and weight that seemed irresistible ; but in vain. The shot flew off in ragged splinters, hissing through the air, the iron plates became almost red hot under the tremendous strokes, and the whole target rang like a huge gong, but nothing more. As a rule, the 68-pounders left their marks in massive dents more deeply than the 100-pounder Armstrongs, but the live percussion shell of either did little more than discolor the plates with the smoke of their impotent explosions. Two discharges, each of three 200 lb. cast-iron bolts, were fired in succession at two different spots, but though, of course, the plates had been often struck before in the same places, the additional injury was comparatively trifling. A grand final salvo was given with all the six guns, trained three on each of the already-battered spots. As the guns were loaded each with 16 lbs. of powder, this volley, in fact was equal to 600 lb. shot fired at the target with 100 lbs. of powder. The effect of the tremendous trial was to make a gap on one side of the target about fifteen inches long, and five deep, driving the iron, in fact, almost into the teak. Some bolts of the plates were also loosened, and the plates themselves began to crack under their long ordeal. Yet, strange to say, even under this the strong teak backing was still undisturbed, and not even the paint on the rivets had started. In fact, as representing the side of a ship, she would still have been perfectly water-tight and uninjured. The tonguing and grooving by which the edges of the plates are dovetailed into each other had given way, as we always maintained it would, and some of the plates themselves had started outward as much as an inch and a half. But the target, as a target, was as good as ever. There is only one possible condition in which the *Warrior* could be placed to be exposed to a concentrated fire as severe as that to which her section was subjected at Shoeburyness, and that would be if she stranded within 200 yards of the guns of a powerful fortress. Even then, in such a last extremity, we are very much inclined to believe the *Warrior* would be quite as formidable to the fort as the fort to her.

The practical result of this grand experiment has been to show that nothing is gained by backing up the armor plates with such a tremendous thickness of teak as twenty inches. It is found that practically ten inches will do as well as twenty, and that the saving thus effected in the reduction of weight will allow another inch thickness of iron to be used in the plates themselves. Thus the "improved *Warriors*," now building, instead of four and a half inches of armor and twenty inches of teak, are to have ten inches of teak and five and a half of iron—an addition to the metal covering which is really unnecessary, as they are already invulnerable, in the most perfect and literal sense of the term, to all the efforts of artillery.

Life-Saving Association.

The Life-Saving Benevolent Association have elected the following officers for the ensuing year :—Thomas Tileston, President ; Charles H. Marshall, Vice-President ; John D. Jones, Secretary ; W. H. H. Moore, Treasurer. The Association have also adopted the following resolutions :—

Resolved, That the gold medal of the Association, suitably inscribed, be presented to Lieut. John W. Kittredge, U. S. N., for his humanity, energy and skill in rescuing a little boy from drowning in the bay of New York on the 20th of July last.

Resolved, That the sum of twenty-five dollars be presented to Charles Hungerford, one of the crew of pilot boat No. 16, for jumping into the water in the Narrows near Fort Hamilton, and rescuing a little girl from drowning, whose mother under misfortune exposed her to this fate, on the 16th of August, 1861.

Resolved, That the gold medal of the Association be prepared for Hamilton E. Towle, and incribed as follows :

"Presented to Hamilton E. Towle for his ingenious contrivance of a steering machine, which he fitted in the steamship *Great Eastern*, under circumstances of great peril, and subsequently of complete success in saving the lives of numerous passengers and of that noble ship."

Our readers will remember that the steering apparatus referred to was illustrated on page 264 of our last volume. Mr. Towle has since opened an office for Civil Enginering at No. 160 Fulton street, this city.

PREVENTION OF WOOD ROTTING.—To prevent posts and piles from rotting the following coating has been recommended, which is the more suitable since it is economical, impermeable to water, and nearly as hard as stone :—Take 50 parts of rosin, 40 of finely-powdered chalk, 300 parts (or less) of fine white sharp sand, 4 parts of linseed oil, 1 part of native red oxide of copper, and 1 part of sulphuric acid. First heat the rosin, chalk, sand and oil, in an iron boiler ; then add the oxide, and with care, the acid ; stir the composition carefully, and apply the coat while it is hot. If it be not liquid enough, add a little more oil. This coating, when it is cold and dry, forms a varnish which is hard as stone.

THE PATENT OFFICE AND SEEDS.—Large invoices of seeds have lately been obtained from Europe at the Patent Office, and have been made up in packages for members of Congress, each of whom will be furnished with 417 papers, comprising forty-two varieties of the valuable seeds referred to, making an aggregate of 94,659 papers. To Agricultural Societies throughout our country there will be transmitted 47,329 papers, including all the varieties, and 47,329 papers will then remain for general distribution amongst persons making application from any part of the country.

THE condition of affairs at the Patent Office is at present most satisfactory. The number of applicants for patents is daily increasing, and the examiners act upon cases so quickly now that it encourages some inventors to apply for patents who formerly neglected to do so, owing to the tardiness of the officials in deciding upon applications.

TO STOP BLEEDING.—A correspondent of the *American Agriculturist* writes that bleeding from a wound in man or beast may be stopped by a mixture of wheat flour and common salt in two parts bound on with a cloth. If the bleeding be profuse, use a large quantity, say from one to three pints. It may be left on for hours, or even days, if necessary.

JOSEPH E. CARVER, the well-known cotton gin manufacturer, at Bridgewater, Mass., has left here for Port Royal, having an engagement with the United States government relative to ginning the cotton gathered in that vicinity by Gen. Sherman's "contrabands."