

Science & Mechanics.

A cannon which can be fired thirty times in a minute was tried this week at Asnières. The results were, it is said, highly satisfactory, and a commission is about to sit on the cannon, headed by General de Cisse. The inventor is an Italian engineer named Bellotti.

The project of a railway in the colony of Natal, which has been so long discussed, has been brought to a determinate issue. The length of the line is to be 345 miles. The Colonial Government is to give a subsidy of £40,000 per annum for twenty years, and make a grant of 2½ million acres of land.

The most remarkable engineering feat now in progress is to be the crossing of the Andes by the Lima and Oroya Railroad. The mountain chain will be crossed at an altitude of 15,000 feet by a tunnel 3,000 feet in length. The grades are the steepest known on any ordinary railway. The workmen employed are Cholos Indians, the only operatives who can endure for a prolonged period the rarefied atmosphere at this great elevation.

The new bridge now in course of construction over the Frith of Tay, Scotland, will be the longest bridge in the world—longer even than the Victoria bridge, Montreal. The Victoria bridge is 9,194 feet long, while the Tay bridge will be 10,321, making a difference in favour of Tay bridge of 1,126 feet. If the Tay bridge were eighty yards longer, it would be two miles exactly, and for all intents and purposes it may therefore be called a two-mile bridge, and will have ninety piers and eighty-nine spans.

Science is making great progress in Japan, Chemistry being an especially favourite study with the young students. There are in the country at the present time four laboratories where this branch of science is taught. Three of these are presided over by Germans and the fourth by an American. The chief one is at Osaka, where there are nearly 100 students. The rest are at Kago, Shidzoka and Fukuwi. A fifth will soon be opened at Yeddo. The students are said to be fairly intelligent, but their minds are at present encumbered with astrology and other kinds of spurious philosophy.

The following is worthy of the attention of the opponents of vaccination:—According to a statement made at the Statistical Congress, held this year in St. Petersburg, the total number of deaths from small pox in the German Army during the recent Franco-German war was 263. This small mortality is attributed to the system of compulsory revaccination, which every man who enters the army must undergo. On the other hand, in the French Army, where revaccination is not compulsory, the number of deaths, as stated by a French authority, was 23,469. This terrible difference, says the *Wiener Medizin Wochenschrift*, must puzzle the greatest opponents of vaccination.

Paper-hangings, with their odious concomitants, paste, vermin, and evil, unhealthy smells, are doomed. Their place is to be taken by hangings made of metal. An account of this new invention, which comes from Paris, was recently read before the Society of Arts. The metal employed is tinfoil, in sheets about sixteen feet long, and from thirty to forty inches wide. The sheets are painted, and dried at a high temperature, and are then decorated with many different patterns, such as foliage, flowers, geometrical figures, imitations of wood or landscapes. When decorated, the sheets are varnished, and again dried, and are then ready for sale. Tinfoil is in itself naturally tough, and the coats laid upon it in preparing it for the market increase the toughness. The hanging of these metallic sheets is similar to paper-hanging, except that the wall is varnished with a weak kind of varnish, and the sheet applied thereto. Thus in this way a room or a house may be newly painted, without any smell of paint to annoy or harm the inmates. Moreover the tinfoil keeps out damp; and as the varnish is a damp-resister, the protection to the room is twofold. Experience has shown also that cornices, mouldings, and irregular surfaces may be covered with the tinfoil as readily as a flat surface; hence, there is no part of a dwelling-house or public building which may not be decorated with these new sheets; and, as regards style and finish, all who saw the specimens exhibited at the reading of the paper, were made aware that the highest artistic effects could be achieved at pleasure.

An interesting case of writer's cramp—an affection of the muscles of the arm and hand peculiar to writers, accountants, and others who use the pen to any great extent—with an account of the system of treatment pursued with great success, is described by Dr. G. V. Poore in the *London Practitioner* for September. The case he describes—that of a very active accountant—was, when it came under his treatment, of nine years' standing. The right and then the left hand had been disabled for all writing, and a few weeks before Dr. Poore was applied to, the patient's right arm "had become liable to sudden

spasms even when not called upon to perform any act.... It was always jerking about, and at times would bounce out of the side pocket of his coat as he was walking in the streets." As these spasms grew doubly severe when the patient was conscious that they attracted attention, Dr. Poore found in this circumstance an analogy with stammering, and regulated his treatment accordingly. "Every stammerer," he remarks, "that I have ever met can sing. They are all capable of a rhythmical use of the voice, and every stammerer has, I believe, his cure within his own grasp, if he persevere in the orderly and rhythmical exercise of his vocal powers. I determined to apply the above principles to the treatment of the stammering right arm." This he did in connection with the galvanic current with the most gratifying success, as is shown in the fac-similes of the patient's handwriting which accompany the paper in the *Practitioner*. Dr. Poore does not hint at any other cause of the disorder than what is implied in the word "cramp." The disease has, we believe, been traced in some cases to the use of the steel pen, which would appear to have some peculiar electrical effect on the muscles. At all events a resort to quills has often been known to afford relief to persons afflicted in this manner.

The subject of the best means of ventilating railway carriages is one that owing to our variable climate must always command attention in this country. During the summer months travel by rail is excessively unpleasant, owing to the intense heat inside the cars; while during the winter, when the cars are tightly boxed up so as to retain the heat from the two stoves and to exclude any breath of the sharp atmosphere outside, the temperature within, always unpleasant, becomes positively unhealthy. Any invention which may do away with this difficulty deserves notice from railway men, so we invite their attention to the following account of a new description of ventilator affixed to the Queen's saloon carriage on the London and North Western Railway:—Outside the carriage nothing strange is noticeable beyond three little projectors on the roof right over where the lamps are generally let in. These protuberances are what are called the caps of the ventilator. The movement of the train causes them to work and keep up a thorough ventilation inside each carriage to which it is affixed. The arrangement in the interior of the roof of the carriage is nothing more than an ornamental grating. Between the grating and the cap outside there is a cavity for the lamp. The cap is so constructed that ingress to wind and rain is wholly prevented. The cap rotates without noise, and by an ingenious mechanical arrangement creates an upward current which carries away all impure gases that may be generated. This obviates the necessity of opening the windows of railway carriages in damp and cold weather—the only resource one now has to escape the offensive and deleterious atmosphere which too often pervades railway carriages. This cleverly-arranged little appliance can be fixed upon any railway carriage without disturbing present arrangements. It improves some of them, for, being placed over the lamps, the ventilator supplies them with air, so that their illuminating power is maintained whatever may be the state of the weather. This ventilator can be as easily fitted into omnibuses, holds of vessels, &c., as railway carriages.

It was deemed a great feat in England when railway carriages were lighted with gas; but now, it seems, the ocean steamers are to have the same boon. Tried in one of the great steamers which ply between Liverpool and New York, it has answered admirably, although the vessel encountered severe weather. The saloon is said to be lighted as brilliantly as any ball-room. Here is certainly good news to those who must cross the Atlantic in the winter months, when the evenings are long, and when darkness as well as cold drives the passengers below. Hitherto they have exchanged the gloom of the deck for the semi-gloom of the cabin; and what could they do by the aid of the lamps, which sent out a fitful light? To read has been impracticable, unless the book has been pushed against the scanty flame, and the experiment is seldom tried. The passengers must either eat, drink, play at whist, or go to bed, and they usually do all four things in rapid succession. Some, however, eat, and others drink all the evening, because they cannot see to read or write. But the dark ages have now passed away from the saloon, and the hours will be spent amid the full blaze of civilization. Nor need there be any more danger of fire than there is at present, for gaspipes can be made as safe as lamps, and the management of the great passenger steamers which sail from Liverpool is a model of caution. In those which ply upon the Mississippi it is deemed safe to leave uncovered lights about, despite the copious arrangements for "liquoring up," and, of course the huge structures are occasionally burned to the water's edge. But the Cunarders permit no such tampering with fire. They are governed by a beneficent despotism, which acts upon the principle that the passengers cannot safely be trusted with facilities for lighting their own pipes after certain hours.

Courier des Dames.

THE SERVANT GIRL NUISANCE—AN ENGLISH REMEDY.

An English lady, Mrs. Chilton, who resides in Surrey, has determined to start a training school for servants, and in a letter to the *Queen* gives some account of the method she intends pursuing in her hazardous venture. The subject is one possessing great interest for Canadian housekeepers, who may possibly take a valuable hint from Mrs. Chilton's communications. We see no reason why some similar institution to that proposed, with, of course, certain necessary modifications, should not be founded in this country. The following is the substance of the letter: "I have been advised by several friends to ask you to bring to the notice of your readers the enclosed prospectus of a small training school for servants, which is to be opened next month at Compton, in Surrey. It is an attempt to improve the present race of servants, and I hope it may prove useful to mistresses, and to the young girls I am anxious to train. I am obliged to ask for co-operation from those who may sympathise in the scheme, which has been found to answer well in other places; and I wish especially to beg the attention of those ladies who are interested in any promising young girls, particularly any motherless or orphan girls. The terms asked are so low that, even in a labourer's cottage, a child can scarcely be kept at the rate named. I therefore hope for annual subscriptions to enable me to make up deficiencies. I cannot for some time expect the school earnings to assist much in the yearly cost of maintenance, at the present high prices, although the utmost economy, consistent with health and comfort, will be practised." Mrs. Chilton says she has obtained the lease of a farmhouse, with a garden and an orchard, and hopes soon to start with a matron and eight or nine girls. They propose to let a portion of the building, to take in washing and needlework, to teach dairy work, baking, and plain cooking. The proposed rules are as follows: "1. That annual subscribers of £1 1s. shall have power to nominate girls who fulfil certain requirements: and that £1 1s. shall be paid for each girl on admission as entrance fee, and 2s. per week, paid quarterly in advance. 2. Girls must be over fourteen years of age, with excellent characters, and good health, and without any bodily or mental drawback to their becoming first-class servants. 3. It is intended that admission to the school should be a reward for good conduct to the best girls from national schools. 4. The right of declining any unsuitable girls, or returning them for decided misconduct, is reserved. 5. They must come well provided with suitable clothes, of which lists will be sent to each candidate. 6. The girls will be kept in the school for two years, unless in exceptional cases, or if good situations should offer before that time, in which case the quarter's payment must remain in the school funds. 7. A holiday of one fortnight will be permitted once a year if required." There is no doubt whatever about the good features of the plan, but it will occur to some, and this is one of our motives for making it public, that a scheme which appeals to the public for contributions, &c., should be under the direction of a committee, and have all proper officers as guarantees of good faith. We believe that many admirable projects collapse in consequence of want of business tact and suitable arrangements. Lastly, we must record our great anxiety lest establishments for training domestic servants should sometimes be incapable of teaching some of the departments of domestic service.

A DEFENCE OF THE SIDE-SADDLE.

Our readers are probably aware that a movement has recently been got up among certain New York young ladies of good family and position, having for its object the abolition of the side-saddle and the adoption of the manly fashion of bestriding a horse. A writer in *Turf, Field and Farm* is justly indignant at the proposed innovation as indelicate and utterly uncalled for. "What," he exclaims—or is it a lady writer?—"what are the American women coming to? From long experience in fox-hunting, I can vouch for the safety and ease of a woman's seat on a well-built English side-saddle; but the saddle must be an English hunting saddle, properly fitted to the back of a well-broken, highly-bred saddle horse—if possible, an animal that has been ridden to foxhounds, and the rider must not be encumbered with a long, loose habit skirt. She must be attired for hard work in a close-fitting, comfortably-fitting cloth habit, the skirt of which should not do more than touch the ground when the wearer stands; also, the stirrup should be a plain steel one, neither lined nor padded, and fully two sizes too large for the rider's foot. If these proper precautions are taken, there is no more danger in riding on a side-saddle than there is in sitting on an ordinary chair. Where the danger now arises is that the riders have no more seats than meal-sacks, and no more hands than if nature had only supplied them with

ans. In reference to a letter signed 'Delaware,' he says his daughter's long skirt caused a horse to shy, and in shying he threw out of their carriage a gentleman and his wife and child. Why did his daughter allow her skirt to fly loose and frighten the horse? Yet to me this is far better than to kill him outright, as I imagine so susceptible a brute would be by the unlovely and novel sight of a female riding *en cavalier*. In Central Europe I have frequently seen peasant women riding astride on mules and donkeys, perched up between their market-baskets; but I never saw, and I never want to see, a woman of education and refinement riding astride, on the road, in the Park, or in the hunting field. In the British Isles, where women ride as forward as the men, there are, proportionally, far less serious accidents amongst female riders than amongst male, and this is to be accounted for mainly by the fact that, being compelled from the nature of their seat to ride chiefly by balance, they become more scientific in the handling of the reins, and less likely to bully a horse or rough handle his mouth. Fighting a horse and rushing him at his fences is just the correct way to bring him and his rider to grief."

A correspondent of the *Liege Gazette* sends to that paper from Brussels a description of the condition and manner of life of the Empress Charlotte in the chateau of Tervueran. Her physical state is represented as being as good as it ever was, and much better than it was two years ago; but there is no change for the better in her intellectual condition. She has degenerated to a sort of conscious child-likeness, but without the least tendency to violence. Of course she lives in a very retired style—it may be almost said she is alone in two rooms of the chateau, where she herself attends to all the cares of her small ménage. Her doctor is the only person to whom she seems attached, and who exercises a decisive influence over her. She receives him every morning for half-an-hour, and appears quieted after these interviews. The 29 other individuals of all ranks who compose her household are far from enjoying such favour; the Empress accepts their attentions with repugnance, and very frequently repels them altogether. She dines always alone; she lights her own fire, and does many other things usually left to attendants. She spends the greater portion of her day inditing telegraphic despatches to Napoleon III., whom she still supposes at the Tuileries, and in conversing with spirits which haunt (she says) the upper stories of the castle, and of which she alone, as she generally boasts, understands the language. She is fond also of spreading out rich toilettes on the chairs, and practises before them the ceremonial of court receptions. In her eyes these robes and chapeaux represent the ladies of France and Mexico. She hatters one, and speaks harshly to another, and thus spends portions of her time. Strange to tell, she seems to have lost all affection for her kinsfolk, even for her brother, and will not receive the Queen, much less the King or the Comte de Flandre. The fear of being poisoned has gone, for the Empress eats with excellent appetite all that is brought to a neighbouring room, where she goes to help herself. All hope of her cure has disappeared, which is still more sad as her excellent physical health promises a long life.

An excellent institution, says the *Woman's Journal*, exists in London, called the "Refuge for Deserted Mothers and their Infants." A thousand young women have passed through the home and been restored to society. Relapses never occur. The mortality among the infants put out to nurse is almost nil. The gratitude of the young women to their benefactresses is one of the most touching incidents of the system.

The following sharp hit at "strikers" appears in the form of an advertisement in an English paper: "My husband is out on a strike. He professes that to work. He ain't any use to me. I must work to keep the children and self. His ten shillings goes in beer. I'll swap my husband, while he's on strike, for a sewing machine."

Useless industry is well illustrated in the case of Miss Frank, of Wyandotte, Kansas, who has been engaged some time in embroidering a life-sized picture of St. Patrick. She has taken 1,500,000 stitches already, and it will take several weeks more to complete the picture.

Mr. George Augustus Sala, at a public dinner in England, lately, was called on to propose "the ladies," which he said he had already done in nineteen different countries, and in sixteen different languages. What a valuable man is Mr. Sala!

The *London Globe* says that the attitude in which croquet is played is utterly destructive of all healthy development. A long walk taken with open eyes is worth all the croquet with eyes glued to a lawn.

The *London Court Journal* says: "We are in a position to affirm that Mrs. Meriman, the widow to whom Father Hyacinthe is united, possesses a fortune of seventy-five thousand dollars."