

against the ramparts, and spare, as much as possible, the dwellings of the defenceless inhabitants. Until one in the morning the fire was kept up, without doing much damage, it is true; to property, but costing several lives. During that night the first victims of the siege—two women and several children—were killed in their beds by the explosion of Prussian bombs. From Tuesday, the 16th of August, until Monday, the 22nd, nothing of importance occurred. It was understood that negotiations were pending between the commandant, Gen. Ulrich, and the commander of the besieging army. But little was known in the city as to the condition of outside affairs, though it was reported that Bazaine had won important victories at Longeville and Viouville, and that an army, under General Dumont, was marching to the relief of the besieged. On the evening of the 23rd it was rumoured that the negotiations had been broken off. Von Werder had made an ultimatum which Gen. Ulrich had refused; the Prussians were making active preparations for a vigorous bombardment, and siege guns were being brought in all haste from the fortress of Bastadt. The next morning the Mayor issued a proclamation calling upon the inhabitants to endure with courage the dangers of war. At eight o'clock that evening the bombardment commenced. The shops were closed, the inhabitants not employed in the defence or engaged as patrols shut themselves up in their houses, and the women and children withdrew to the only places of safety that remained—the cellars. During the whole of that night the bombardment was kept up without a moment's intermission and with terrible effect. The Quartier de Broglie, in the centre of the city, the abode of all the wealthiest inhabitants, was set on fire, and many of the magnificent buildings utterly destroyed. Later on, the Protestant college was struck by a shell, and in a few moments the whole building was in a blaze. The Temple-Neuf was also set on fire, and now it became evident to all that the library-building, situated between the two last, must also go. Every effort was made to save the treasures of the library, but in vain; shells were falling fast upon the building, and all the attempts of the firemen to extinguish the conflagration were rendered useless. Towards midnight the Temple-Neuf, the library, and the college, which, since the beginning of the siege, had been converted into a hospital, were reduced to ashes. Before morning the Museum of Paintings, the Arsenal, the Rue du Dome and one half of the quartier de la Krutenen were entirely destroyed. On Thursday the bombardment was renewed with increased vigour. What was left of the quartier de Broglie was speedily reduced to ashes. A little later the cathedral was struck by a stray shell, and the wood and zinc roofing of the nave was speedily wrapped in flames. It is at all events gratifying to learn from a recent despatch that the injury done to this noble edifice is but slight and can easily be repaired; and also that the books in the library had been removed before the commencement of the bombardment. Our illustration gives some idea of the scenes which were to have been witnessed day after day within the walls of the city during the five weeks' bombardment it has undergone.

Another correspondent, writing from without the walls, gives the following description of the scene on the first night of the bombardment:—"Since the 21st the real bombardment has commenced, and it was the report of its severe effect resulting in a conflagration of terrible proportions which induced me to undertake the expedition. As evening came on the besiegers, who till this time but occasionally opened from all their batteries an incessant fire of shell and heavy cannon upon the defences of the city which was answered for the first part of the night. But what made the scene one never to pass from memory was the terrible conflagration which burst out in Strasburg about nine o'clock and raged on throughout the night. At the commencement the fire was apparently within the citadel alone, but soon we could see that it raged on various points, and we counted distinctly from eight to ten different fires burning luridly in the black night, and Strasburg stood out before us a city of devastation and raging misery. But even this scene of glowing destruction of a sudden became intensified. It was just close on a quarter to three as I stood watching with breathless interest the rapid succession of shells flying into the doomed city, when, like the flash of a Bengal illumination in a theatre, there shot up a bright glowing flame, wonderfully clear and perplexingly smokeless, that shed a white light through the murky night, and of a sudden lit up the minster with a vividness that instinctively brought a hushed exclamation to the group amid which I was standing: "Good God! the cathedral is on fire." But the next moment convinced us that the glorious old minster on which waves the white flag was untouched. The conflagration, so startling and so tremendous, was elsewhere. Where it might be was indeed matter for speculation, though now we know that it was the arsenal which was destroyed. For hours and hours it burned on, the same glow of clear lambent fire shedding over minster and over the dark outline of the city, against a horizon dotted with lines of lurid fire, an indescribably pallid and ghastly illumination. I left my station as the day dawned, and still the fire was raging; and as I quitted Appenweiser on my way back here there still came forth on the horizon volumes of smoke-clouds to tell the tale of continued devastation."

A despatch dated Strasburg, Sept. 29, says:—"On Tuesday at 4 p. m., a joyful sight of white flags was beheld flying from the cathedral. This was speedily followed by some welcome token of surrender, and from the citadel firing instantly ceased. The universal cheer which rose from one portion of the besieging lines was soon caught up and echoed throughout the entire army. Officers embraced each other, clasping hands. The men followed this example, and some actually cried with joy. Upon entering the city, the sight, which was impressive and sad at the same time, was relieved by the evident joy of the citizens. The commanders of the two forces met for the first time yesterday after the terms of capitulation had been arranged.

A meeting took place just inside the gate on the east side. Gen. Ulrich advanced to Gen. Werder, and with a voice much agitated, said: "I have yielded to an irresistible force when a further resistance was only needless and a sacrifice of lives of brave men. I have consolation in knowing that I have yielded to an honourable enemy." General Werder appeared much affected and placed both hands on General Ulrich's shoulders and said, "You fought bravely. You will have as much honour from the enemy as you can have from your own countrymen." A hasty examination of the city shows it has not suffered as much as was supposed. The exterior of the cathedral appears much injured, but not sufficiently to prevent its restoration in its original shape.

OPENING OF THE WELLINGTON, GREY, AND BRUCE RAILWAY.

We present our readers this week with a view of the important gathering at the flourishing little village of Fergus, Ontario, on the occasion of the opening of the first section of the Wellington, Grey, and Bruce Railway. This railway, when completed, will open up one of the finest agricultural districts in the Dominion of Canada; and divides the largest area of settled or partially settled territory in Ontario, hitherto unsupplied with railway facilities. It embraces the district between the Buffalo and Lake Huron Railway on the one side, and the Northern Railway on the other, having the Grand Trunk Railway at its southern boundary, and Lake Huron and the Georgian Bay to the west and north, and it includes the important counties of Wellington, North Huron, North Perth, Bruce and Grey. Taking the growing town of Mount Forest as a centre, a circle of forty-five miles radius might be described, before the commencement of this railway, without touching any of the existing railways or water communications of the country. The Wellington, Grey, and Bruce Railway, starting from Guelph, touching the villages of Elora and Fergus on the Grand River, running up through the northern townships of Wellington, skirting the south-west corner of the County of Grey, thence through the County of Bruce to Southampton on Lake Huron, will almost evenly divide this extensive territory; and with the narrow gauge railway now being constructed from Toronto to Arthur, with some prospect of being continued to Owen Sound, will fully supply the splendid district with railway facilities, and will enormously promote its prosperity.

The Wellington, Grey, and Bruce Railway is a striking illustration of what may be accomplished by steady perseverance and pluck. The first charter for the road was obtained by some gentlemen in Toronto in 1856; but beyond procuring a preliminary survey and report from Mr. Sanford Fleming, nothing was done. The charter was revived in 1864 by Mr. Frank Shanly; but again there seemed little prospect of anything being accomplished; when, in 1865, a few gentlemen in Fergus summoned a meeting of the leading men of the district to be served by the railway, and invited several gentlemen from Hamilton to meet them. Mr. Adam Brown and Mr. Thos. White obeyed this summons; but beyond an expression of opinion as to the importance of the work, nothing practical resulted from the assembly. Other meetings were held, and in July, 1867, the first serious work of the campaign commenced. Meetings were arranged in the Townships, which were attended on behalf of the Company by Messrs. Adam Brown, Wm. McGivern and Thomas White, and at each of these resolutions offering assistance by way of bonds were passed. By-laws were subsequently voted, and up to this time about half a million of dollars have been granted as bonuses by the Municipalities to the Railway. To secure this result involved no little labour, as may be inferred from the fact that no less than twenty-four deputations have visited the Townships during the last five years.

Having secured this municipal basis, the Company opened negotiations with the Great Western Railway of Canada, which resulted in an exceedingly favourable arrangement being made. The Great Western Company agree to lease the line as constructed, to supply it with rolling stock, and to keep it in good running order, making all necessary outlay for maintenance and repairs, and giving to the Wellington, Grey, and Bruce Railway Company thirty per cent. of the gross traffic receipts, towards paying interest on capital, and, in addition, twenty per cent. of the gross traffic interchange between the two systems at Guelph, towards the redemption of the bonds by allotment annually. This arrangement gave an immediate cash value to the securities of the Company, because under it the only contingency upon which depended the payment of the full interest on bonds and a dividend on stock, was the amount of traffic, and that with such a country from which to draw business, made the securities good value for the face of them.

The opening represented in our pages to-day was of the first section. The Railway has been running to Elora since June last, and has had a traffic far beyond the anticipations of its promoters. The opening at Fergus was attended by many thousand people, a special train having gone up from Hamilton, and the people of the surrounding district having poured in to the village in teams to celebrate the realization of what has been with them a long deferred hope. The view represents the scene at Fergus, the Reeve presenting the address of congratulation to the President of the Company, Mr. Adam Brown. A splendid luncheon, followed by a Ball in the evening, were included in the arrangement by which the enterprising people of Fergus celebrated the most important event of their history.

The road is being pushed onward vigorously by the contractor, Mr. Hendrie. In less than a month it will be opened to Alma, six miles from Fergus, and in a couple of months the locomotive, it is expected, will be in Drayton, six miles further. The surveyors are engaged in locating the line through Bruce, and the contract for that county will be given out immediately; so that within the next twelve months travellers will in all likelihood be able to reach Walkerton, the county town, by rail. All will congratulate the Company upon their success thus far, and will wish them a continuance of it in the future. This enterprise is one of the most important that has ever been undertaken in the Western Province since the completion of the Great Western and Grand Trunk railways; and though the rivalry between the aspiring and prosperous cities of Hamilton and Toronto in their respective railway schemes may have caused the circulation of reports detrimental to both of them, we who know the ground on which they are working, the wealth of the country through which their projected lines are intended to pass, and the indomitable energy of the people, need only wish them both God-speed, in the full confidence that they will be amply rewarded by the increased prosperity which the success of their enterprises will undoubtedly create.

THE PULLMAN PALACE CAR "MONTREAL," G. T. R.

On Monday, the 22nd of August, the first of the Pullman Palace cars was placed on the Grand Trunk Railway at this city, and ran through with the night train to Toronto. On the return trip it was placed at the disposal of the Illinois Press excursionists, most of whom were already familiar with the merits of the Pullman cars, having already travelled in them over the western roads, and they welcomed the car "Montreal" all the more heartily that they had had some

little experience of travelling without the comforts which only the Pullman cars afford. In our issue of the 27th of August last we gave a brief description of the new car which, in company with other members of the city press, we had visited, on the invitation of Mr. Thos. Clark, the Superintendent. The second car, the "Toronto," has just been completed, and both these cars now run regularly on the Grand Trunk between this city and Toronto. It is intended to have two additional cars finished before the winter and eight more next spring, so that the Grand Trunk will then be fully equipped with these comfortable and commodious travelling palaces. The Pullman Car Company owes not a little of its success to the stringent relations it enforces among its employees as to civility and attention to passengers, and cleanliness and comfort on board its cars. By this, and by the unequalled facilities for enjoying every home convenience while being whirled along by the iron horse which the Pullman cars afford, the Company has established its fame among the travelling community of America, and achieved a degree of prosperity almost marvellous. Some five years ago the Pullman Car enterprise was turned into a Joint Stock Company with a capital of \$100,000; and this capital, by successive augmentations, as the business grew, has now swelled to the enormous amount of eight millions of dollars. The Company has now about five hundred cars running, one hundred and fifty in course of construction; and, between the hands engaged in both branches, it has a staff of over three thousand employees. These facts speak eloquently for the service this Company renders to the public, showing as they do the appreciation of the travelling community; and we believe that on almost every line on which the Pullman cars are run there is a pressing demand for more. We must congratulate the Grand Trunk Railway Company, as well as the Canadian travelling community, on the introduction of these splendid cars into the country; and while we are sure that they will do much to mitigate the inconveniences of travel, we also hope that both the G. T. R. Co. and the Pullman Car Co. will find their adventure here a profitable one. We mentioned before that these cars for Canadian service were being built at the Grand Trunk Railway works at Point St. Charles, in this city, under the personal direction of Mr. Rattenbury. Mr. Clark, the Company's superintendent, has the charge of their running, and under his direction the public may rely upon their every requirement being promptly attended to so far as the facilities, hitherto unequalled, of the Pullman cars will permit. In fine, under the management of this Company, railway travelling, hitherto regarded as a bore, threatens to become a luxury.

THE PERCÉ ROCK.

The rock bearing this name is a curious freak of nature, in the shape of a treble archway of solid rock. It is situated in Malbay, in the county of Gaspé. Bouchette thus describes the Percé Rock in his Topographical Dictionary of Lower Canada:—"This singular fragment is pierced (whence is derived the name of Percé) by two arches, which resemble at a distance the portals of fortifications in ruins, and appears like the remains of some enormous wall which have survived the disaster that destroyed the adjacent works. The spectator may approach it at low water from Mount Joli without wetting his feet. The distance between the mount and the rock is about 50 ft. When the rock is approached for the first time, the spectator trembles lest it should fall upon him; its height is at least 300 ft. and it is about 30 yards in its widest part, but its breadth above the arches is not more than 20 ft. Besides the two great arches, there is a lateral arch on the s. e. side scarcely perceptible from the water. However high this rock may be, it is low in comparison with the adjacent capes s. w. of the village of Percé, which rise one above the other as if mountains piled on mountains had been cut through the middle and one part had fallen into the sea, while the other part remained a naked and frightful chain of precipices of unequal height. The Island of Bonaventure, rather more than a mile from the main land, terminates this picturesque scene, not to be exceeded by any other on the American continent. The great number of mountains and precipices in this place renders it very subject to sudden storms and violent gusts of wind, which has induced some to call it *Terre des Tempêtes*, the land of Tempests. In fact it is an astonishing place, and the fertile fancy of romance would choose it above all others for the scene of marvellous histories and supernatural adventures, visions, spirits and enchantments. Until within a few years this steep rock was considered inaccessible and its only inhabitants were the sea-gull and the cormorant; here they laid their eggs and reared their young in perfect security. A young man of Percé, full of mirth during a holiday, undertook to ascend this rock by means of the lateral arch; his first attempt was unsuccessful—his heart failed him and he descended; but after a minute or two he made a second attempt and to the great astonishment of all the spectators he succeeded, apparently with much ease. He placed a little flag on both extremities of the summit and, by means of ropes and ladders, many others were induced to ascend, partly out of curiosity and partly for the eggs and hay which were there found. The sea-birds being disturbed in their retreat abandoned it, and their departure was considered a public loss, for the fishermen returning from sea in dark and stormy weather were always, if out of their course, guided safely home by the cries of the birds heard from their rocky dwelling; the bold feat of this young man deprived the fishermen of this advantage and the poor of the food which these birds afforded. A police regulation, therefore, with the consent of all the inhabitants, has prohibited any one from ascending this rock during a certain part of the year; this has had the beneficial effect of inducing the birds to return to their ancient habitation, where they now live and multiply under the protection of the law.—Two miles s. it is said that two men-of-war belonging to the squadron that attempted to take Quebec in 1721 were wrecked.—The settlement of Percé derives its name from the rock which the French Canadians call *Roc Percé*."

ON THE BREADTH OF SPECTRAL BANDS.—Lippich has given, in Poggendorff's *Annalen*, an explanation of the broadening and other variations of the spectral lines of luminous gases, which he ascribes to changes in temperature. The law he claims to have discovered is that the ratio of the difference of the wave-lengths which correspond to the borders of any spectral band to the mean wave-lengths of such band is constant in the same gas, but in different gases the ratio is directly as the square roots of absolute temperature, and inversely as the square roots of their densities.