

CALENDAR FOR THE WEEK ENDING SATURDAY,
MARCH 1st, 1873.

SUNDAY,	Feb. 23.—	Quinquagesima. Pepys born, 1632. Joanna Bailie died, 1851.
MONDAY,	" 24.—	St. Matthias, Ap. & M. Handel born, 1684. Quin born, 1693. Lord Clive born, 1726. Charles Lamb born, 1775. Keats died, 1821.
TUESDAY,	" 25.—	Shrove Tuesday. Wallenstein assassinated, 1634. Saint Foix born, 1703. Sir Christopher Wren died, 1723.
WEDNESDAY,	" 26.—	Ash Wednesday. Arago born, 1756. Victor Hugo born, 1802. Kombe died, 1823. Tom Moore died, 1852.
THURSDAY,	" 27.—	Evelyn died, 1706. Planché born, 1796. Longfellow born, 1807.
FRIDAY,	" 28.—	Montaigne born, 1533. George Buchanan died, 1882.
SATURDAY,	March 1.—	St. David. Rabelais died, 1553. The Germans entered Paris, 1871.

OUR CHROMO.

Owing to the large number of copies of the Chromo now being printed the delivery to subscribers has been unavoidably delayed. We are printing in three tints more than we originally intended, and are thus necessarily somewhat behind. The work is being proceeded with with the utmost diligence, and our subscribers may expect the delivery at an early date.

NOTICE TO CORRESPONDENTS.

Letters on business matters should be addressed to the Business Manager.

Communications intended for the Editor should be addressed to The Editor of the *Canadian Illustrated News*, and marked "Communication."

Rejected contributions are not returned unless stamps for return postage have been forwarded.

THE CANADIAN PATENT OFFICE RECORD AND
MECHANICS MAGAZINE.

PROSPECTUS.

The undersigned has the honour to announce that he has been entrusted by the Honourable Commissioner of Patents for the Dominion of Canada, with the publication of the OFFICIAL RECORD OF THE PATENT OFFICE, to be illustrated by diagrams of all the patents susceptible of illustration. This Official Record will be published Monthly, and will be combined with letter-press and illustrations selected from the best English and foreign scientific papers, thus not only placing before the public of the Dominion the products of native genius and industry, but also keeping them posted on the progress of Science and Mechanics in other countries. Inventors will thus know in what direction to apply their ideas. Mechanics will note the advance in labour-saving appliances, and the improvement in tools. Manufacturers will be prevented from employing obsolete methods, while new machinery and modes of operation are in use elsewhere. Builders and contractors will know where to apply for all the latest productions in their line combining economy, beauty, and utility. Chemists and Druggists will be saved useless search for compounds already invented by others, and be told where to get the most recently discovered curative remedies and toilet requisites. Farmers will see every new agricultural implement illustrated and described. In a word there is not a scientific, industrial, mechanical, or commercial pursuit that will not be benefited by this publication. It is therefore expected that a very large circulation will take place among all classes, and the price is fixed correspondingly low.

THE CANADIAN PATENT OFFICE RECORD AND MECHANICS MAGAZINE will be published once a month. The official portion will cover from 16 to 32 pages, comprising from 100 to 240 patent claims, specifications and diagrams. As the publication will commence with the patents issued under the new Act, which came into operation September 1st, 1872, the first four issues will contain 240 patents each, and each successive number will contain the patents issued during the preceding month.

The unofficial portion, or MECHANICS MAGAZINE, will give in each number 32 pages of carefully selected articles and items, gleaned from the very best foreign technical papers. Every branch of Engineering, Mechanics, and Manufactures will be treated, especially such as have a practical application in Canada. For instance, Railways, Shipbuilding, Lumbering, Mining, Architecture, Machinery, Cabinet-making, and the manufacture of Cloth, Linen, Cotton, Paper, Tobacco, and other articles of Home Industry. Practical Chemistry, Mineralogy, and Natural Philosophy, will also receive attention. Original articles will be contributed by distinguished Canadian scientists, engineers and manufacturers, and the whole will be profusely illustrated.

The subscription price of the CANADIAN PATENT OFFICE RECORD AND MECHANICS MAGAZINE is fixed at ONE DOLLAR and FIFTY CENTS per annum, invariably in advance. Single numbers will be sold at 15 cents. Appropriate advertisements will be inserted at 10 cents per line for each insertion.

The first issue will be dated 1st March, 1873, and will be distributed about the 25th instant.

ADDRESS: GEORGE E. DESBARATS,
PUBLISHER, MONTREAL.

CANADIAN ILLUSTRATED NEWS.

MONTREAL, SATURDAY, FEBRUARY 22, 1873.

European nations no longer fight with standing armies, but the whole available population are in turn passed rapidly through the military mill, to be called forth on emergency. Such is the principle of Prussia. The comparatively small standing army of that country is a military school, in which, however, the teachers are permanent, almost for generations a military caste. England alone has not followed in the wake of the Continental nations for obvious reasons. Among others, India necessitates a long-service standing force being kept up at home for relief abroad. But ballot for the militia is the old law of England, and must be resorted to in her next great struggle. On this continent large standing armies

are neither necessary, desirable, nor possible. Our neighbours have a comparatively small standing army, and the rate of wages in new countries place such institutions simply out of the question. The United States have, however, at West Point a school for professional officers. How are those officers utilized in peace? Those of the scientific corps are employed on public works, railroads, canals, bridges, harbours, &c.

The United States infantry and mounted rifles (they have no gorgeous huzzars and tin-potted heavy dragoons), are for the most part employed in the Indian country, or in keeping down the seething South. Fortunately for us, we have no desperate Southern malcontents; as yet no hostile Indians. But we have a huge undertaking in the Pacific Railway. Can we expect to build it without depots for supplies, &c., which must be guarded? Let us, then, take a leaf from the book of our astute neighbours. We want no military loafers around our great towns. But now the British troops are withdrawn, we do want a nucleus, a pattern, a school of instruction for our militia. Our old military school system has done good work, but its day is past. In the schools only infantry drill was taught, not the science of war, as it is now understood, not even discipline. The mere barrack-square infantry drill has been wiped out by the changes in modern tactics evolved from the last great war. The Adjutant-General of Militia has done wisely in commencing with gunnery schools, but they require expansion and developments. Canada cannot afford separate educational establishments for all arms, like Woolwich and Shoeburyness for artillery, Chatham for engineers, a staff college at Sandhurst, a naval college and a gunnery ship. The training of the scientific corps, artillery and engineers, runs side by side, and at Woolwich they follow the same curriculum of study, which covers all the subjects taught at the staff college, including strategy tactics, military surveying and fortification. At West Point the officers for all arms are taught together, the best are allowed to select the engineers and artillery, and they have, wisely, a greater number of trained officers than are required for their small establishment of regular troops, but these are not allowed to rust, or serve as idle "cavaliers des dames." The most scientific are employed on public works. We have huge public works on hand, the engineering of which, to some extent, is confided to foreigners, who may or may not use the knowledge they thus acquire of our country to the advantage of our possible, if not probable, enemies. The Royal Engineers are at present surveying our North-West boundary. A few of our best officers, non-commissioned officers and men from our gunnery schools might be attached to the boundary survey, a few to the Pacific railway staff, to form, when the Royal Engineers leave our shores, the nucleus of the future Canadian Staff Corps, thus acquiring a perfect knowledge of our country and that practical scientific engineering skill in peace, which their previous military training would render invaluable in war.

Our artillery schools, by having attached to them a small regular force of all arms, would serve the double purpose of practical training as well as being a nucleus for the militia in emergency—not solely a garrison of infantry soldiers with too much time on their hands. We know who is the proverbial employer of idle hands. The Canadian team at Wimbledon have proved how the militia system of this country produces good shooting. Add to this intelligent skirmishing and discipline under officers trained to the science of war, and you have infantry, the great back-bone of an army! Cavalry requires a little longer training, not altogether of the riding-school sort. The excitement of national danger would bring forth a numerous volunteer infantry, but no amount of excitement will produce scientific officers at short notice, and wars in these days are affairs of weeks. We might thus improve on West Point, which is, after all, a mere theoretical school, by giving our schools the practical character of the Prussian army. But we have no conscription to fill our schools, and the ballot is unpopular with the believers of the Washington Treaty millennium. Therefore we must offer inducements of employment in public works, land grants in Manitoba and the Saskatchewan to the better class of officers, non-commissioned officers and men, at the expiration of a limited service. Military posts in those territories would be a prevention of irregularities better than the violent cure we may be driven to. We have an artillery school at Kingston and another at Quebec; why not one at Montreal, the great commercial centre of the Dominion, where there is a large force of volunteers to avail themselves of systematic military training? It is rumoured we are to have no camps of exercise next year, and the money so saved in the Province of Quebec might well be devoted to the formation of an artillery school at Montreal of such a character as to afford the higher military instruction common to all arms.

(Written for the *Canadian Illustrated News*.)

GOSSIPS ON POPULAR SCIENTIFIC SUBJECTS.

NO. IV.—WATERPOUTS, WHIRLWINDS AND HURRICANES.

"Deep calleth unto deep at the noise
Of Thy waterspouts."

PSALM 42, VER. 7.

"— forth pushed with whirlwind sound
The chariot of Paternal Deity,
Flashing thick flames."

PARADISE LOST—VI. 749.

"— I have bedimm'd
The noon-tide sun, call'd forth the mutinous winds,

And twixt the green sea and the azur'd vault
Set roaring war."

Of the different atmospheric phenomena, none is more curious than the waterspouts. That they cause small whirlwinds there seems no reason to doubt.

That able seaman and hydrographer, Horsburgh, gives the following description of what he says are called whirlwinds on shore and waterspouts at sea:

"When a whirlwind, or waterspout, is observed forming at a small distance, a cone may be perceived to descend from a dense cloud in the form of a trumpet with the small end downwards: at the same time the surface of the sea under it ascends a little way in the form of steam, or white vapour, from the centre of which a small cone, proceeding upwards, unites with that projected from the cloud; and then the waterspout is completely formed. Frequently, however, the acting cause is not adequate for this purpose; and in that case, after the waterspout is partly formed, it soon proceeds to disperse."

When a whirlwind happens on land, all the light substances are carried up in a spiral motion by it—sometimes it strips the trees of their leaves, and the light coverings, or roofs, of out-houses and sheds it carries up a considerable way into the atmosphere.

Bruce, the African traveller, narrates how he was surprised and terrified at Waadi-el-Haloub by one of the most magnificent sights in the world, a large number of pillars of sand at different distances, at times moving with great celerity, at others stalking on with majestic slowness; again they would retreat, so as to be almost out of sight, their tops reaching to the very clouds.

Captain Grant, of the Bombay Engineers, has written a very curious paper on the subject which will be found in the second volume of *Engineer Professional Papers*; he states in this paper that "the small whirlwinds of India frequently assume the appearance of a large and lofty pillar of sand moving at a steady pace across the plains; sucking everything of small weight into the vortex, and thus sweep along for miles, being evidently acted upon by two distinct forces, a spiral motion round their own axis, and a progressive or linear impulse."

We find the following in a memorandum, written by Mr. Ainsworth, who kept the meteorological journal on board the steamboat "Tigris," which was sunk in a sudden storm on the River Euphrates, on the 21st of May, 1836, in some respects bears a resemblance to the waterspout and the moving columns of sands referred to.

"It was a fine afternoon, only a few clouds cumuli and cirrostrati in the horizon; a light breeze from the east-north-east; the sun about two hours past the meridian, when a dense black cloud was first observed moving across the wilderness from the west-south-west, and in the teeth of the wind. As it approached, it was found to consist, in its base, of red-coloured masses of dust, which succeeded one another rapidly; breasting the wind in their onward progress, and rising till they were received into the bosom of an overhanging cloud, from which these columns of dust were again precipitated with great force and rapidity, accompanied with violent rain."

Smaller whirlwinds are not of uninfrequent occurrence in North America, and we believe that marks have been traced on freshly fallen snow, which it is difficult to attribute to any other cause than to similar gyrations with those which sometimes mark the smooth surface of the sea.

In the "Philosophical Transactions" Captain Tillard has described lightning as darting from the crater, on Sabrina Island, during the eruption, whilst a great number of waterspouts were forming between the sea and the impending cloud. Many of the descriptions of these whirlwinds speak of a visible flame attending them, and occasionally a remarkable noise, which have induced some philosophers to think their origin is electrical.

From an article on "Æolian Researches" in the *Nautical Magazine* for 1841, we quote the following:

"Sometimes towards that side of the horizon from which the storm comes, is first seen something like a cloud blazing in the most astonishing manner; and some of these hurricanes and whirlwinds have appeared so terrific as to convey the idea that the entire atmosphere and sea was in one tremendous blaze."

Another writer describing a storm says:—"The sea was agitated throughout, and the most astonishing and terrifying circumstance was that the sky became surprisingly red, although the sun was at its zenith. Signs of a tempest were recognized in these appearances, and the storm came as it had been foreseen,—towards night the violence of the wind increased until it attained the proportions of an awful hurricane. The whole atmosphere, the sky and the sea in their wrath seemed but one mass of fire."

In Æschylus the fire and sea are said to "swear together," and to give each other their "pledge of confederacy" against the Grecian army. The dramatists and poets, as we shall see in the following quotations, exhibit the narrow limit of painting, as compared with the boundless power of poetry: painting cannot go beyond a certain point; poetry rejects all control, all confinement. The one a sublime feeling of the unimaginable for a mere image.

In Milton's "Paradise Lost," Book 1, 76, we find

"o'erwhelm'd
With floods and whirlwinds of tempestuous fire!"

And again in Book 2, 180.

"Caught in a Fiery Tempest shall be hurl'd
Knech on his rock transfixed, the sport and prey
Of wracking whirlwinds, or for ever sunk
Under yon boiling ocean."

In Shakespeare's King John, we have

"— the elements
Of Fire and Water, when their thundering shock
At meeting tears the cloudy cheeks of heaven."

What would not our great dramatist have made out of such scenes had he obtained the knowledge of waterspouts and walking sand-pillars to add to his

"Antros vast, and deserts idle,
Rough quarries, rocks and hills whose heads touch heaven;
The anthropophagi, and men whose heads
Do grow beneath their shoulders!"

In order to give some idea of the force and destructive power of a hurricane, we have taken from the Annual Register for 1870, p. 297, the following account of a hurricane which occurred at St. Eustatia, West Indies, on the 10th of October: "In the night every house to the northward and southward was blown down or washed away with the inhabitants into the