

(Written for the Canadian Illustrated News.)

SONNET.

I cried, "this load is far beyond my strength
To bear," and fell upon the ground and wept.
How long I lay I know not, but, at length,
Wearied with pain and sorrow-worn, I slept:
And in my sleep I dreamed that past me swept
A host of joyous faces; every one
Beamed as with pleasure at a victory won.
But none aught trace of pain or sorrow kept.
Wondering, I gazed: when, lo! another scene!
I saw a crowd of weepers from whose hearts
The blood flowed freely, pierced by sorrow's darts
And stinging thoughts of that which might have been.
Then knew I these and those the same; and rose,
Self-shamed and pitiful of others' woes.

JOHN READE.

(Written for the Canadian Illustrated News.)

GOSSIPS ON POPULAR SCIENTIFIC SUBJECTS.

NO. XI.—METEOROLOGICAL INSTRUMENTS.

THE DRY AND WET BULB THERMOMETER OR HYGROMETER.

This instrument, which is also called Mason's hygrometer, consists of two precisely similar thermometers, mounted at a distance of a few inches from each other, the bulb of one being covered with muslin, which is kept moist by means of a cotton wick leading from a small vessel of distilled or filtered rain water. The evaporation which takes place from the moistened bulb produces a depression of temperature, so that this thermometer reads lower than the other by an amount which increases with the dryness of the air. The instrument must be mounted in such a way that the air can circulate very freely round the wet bulb; and the vessel containing the water should be placed a few inches to the side. The level of this vessel must be high enough to furnish a supply of water which keeps the muslin thoroughly moist, but not high enough to cause a drop to form at the bottom of the bulb. Unless these precautions are observed, the depression of temperature will not be sufficiently great, especially in calm weather.

The great facility of observation afforded by this instrument has brought it into general use, to the practical exclusion of other forms of hygrometer. As the theoretical relation between the indications of its two thermometers and the humidity as well as the dew point of the air is rather complex, and can scarcely be said to be known with certainty, it is usual to effect the reduction by means of tables which have been empirically constructed by comparison with the indications of a dew-point instrument. The tables universally used in Canada and the United States were constructed by Arnold Guyot, Professor of Geology and Physical Geography, College of New Jersey.

In connection with the barometer and thermometer, this instrument affords infallible notice of impending weather. In addition to its value to the meteorologist, there are many cases in ordinary life for which this instrument may be used to advantage, and the simple inspection of the two thermometers will often afford a better criterion of the weather and the probability of rain than the barometer itself.

The importance of this instrument in a sick chamber can hardly be over-rated, and it is a great matter of surprise that the medical faculty do not insist in its use, more particularly in hospitals and infirmaries. Mr. Glaisher, of the Greenwich Observatory, says:—

"It would be well for the medical profession to enforce, as far as lay in its power, the use of this simple and effectual instrument, which at all times is valuable with reference to the record of external temperature, as well as hygrometric conditions of the air, and which in case of sickness gives indications so important to the comfort and convalescence of the patient. If the air in the department be too dry, that is to say, if the difference between the readings of the wet and dry thermometers is very considerable, it will be necessary to expose water in some shallow vessel of some extent of surface, so that the evaporation arising from it, mixing with the air, shall create a greater degree of humidity. This process may be considerably accelerated by heating the water, when the evaporation will proceed more rapidly. The reading of the instrument will point out when the proper degree of humidity is attained. If by heated water, the evaporating surface should be either covered over or removed; if by cold water, it may be suffered to remain.

If, on the contrary, the air should be too moist, or should be required to be remarkably dry, all water must either be removed or covered over; and the required degree of dryness will be obtained either by raising the temperature, or by placing in the room sulphuric acid or any other medium which has the property of rapidly absorbing all watery vapour. By these simple means an artificial locality may be produced, and invalids whose circumstances or avocations prevent them from seeking a climate suited to their peculiar constitution, may to a great extent, by the assistance of this instrument, obviate the necessity of so doing.

"In regulating the hygrometrical state of the air in conservatories, &c., it may be made to render the most essential service, the temperature of the air being regulated by the dry bulb, and the degree of humidity by the difference between the two.

"It is well known that in greenhouses the plants often become shrivelled or otherwise injured before there is any suspicion of an alteration in the state of the air; with the view of remedying the evil, a quantity of water, without any guide as to the amount required, is thrown upon the walls; and at other times, with the view of preservation, it is administered in the same indefinite manner, on the supposition of the air being too dry, as determined by the senses. These, with regard to heat and humidity, are very fallacious guides; and everybody must have felt in summer the heat at times to be almost insupportable, without any apparent reason as shown by the reading of the thermometer; this arises from the air being nearly calm and moist."

ANEMOMETERS

The instruments for measuring either the force or velocity of the wind are called anemometers. The anemometer which has yielded the most satisfactory results is that invented by Dr. Robinson of Armagh. It is exclusively used on this continent by the observers connected with the International Meteorological Service. It consists of four hemispherical cups attached to the ends of equal horizontal arms, forming a horizontal cross, which turns freely about a vertical axis.

By means of an endless screw carried by the axis, a train of wheel-work is set in motion; and the indication is given by a hand which moves round a dial; or, in some instruments, by several hands moving round different dials like those of a gas meter. The anemometer can also be made to leave a continuous record on paper, for which purpose various contrivances have been successfully employed. According to experiments conducted by Professor C. Piazzi Smyth at Edinburgh, and by the Astronomer Royal at Greenwich, it has been pronounced the only velocity-anemometer whose indications are exactly proportional to those of the element to be measured. Its price is thirty-five dollars.

The direction of the wind, as indicated by a vane, can also be made to leave a continuous record by various contrivances, one of the most common being a pinion carried by the shaft of the vane and driving a rack which carries a pencil. But perhaps the neatest arrangement for this purpose is a large screw with only one thread composed of a metal which will write on paper. A sheet of paper is moved by clock-work in a direction perpendicular to the axis of the screw, and is pressed against the thread, touching it of course only in one point, which travels parallel to the axis as the screw turns, and comes back to its original place after one revolution. When one end of the thread leaves the paper, the other end at the same instant comes on. The screw turns with the vane, so that a complete revolution of the screw corresponds to a complete revolution of the wind.

THE RAIN GAUGE.

This instrument was described in "Gossips" No. ix. It should be securely fixed in the ground so that the top projects about six inches, and the aperture of the funnel must be kept clear from leaves, &c. It is desirable that the gauge be equally exposed to all points of the compass.

So much for the necessary instruments required for ordinary observations in the pursuit of weather wisdom. A little practice will enable the observer to judge for himself concerning coming weather. To doubt that science of weather is possible, would be to doubt that atmospheric disturbances are governed by fixed laws.

CANADA, AS SEEN BY ENGLISH EYES.

QUEBEC TO MONTREAL.

I left Quebec with a feeling of regret, for I scarcely expected to find anything more interesting than the quaint old city, its people, and its surroundings. Everybody, and everybody's uncles, aunts, and nieces, has heard of the Grand Trunk Railway. Everybody who takes up a daily journal in England has "Grand Trunk" inevitably staring him in the face on some page of the paper. I had seen so much of this that I had an immense respect for the Grand Trunk—the same sort of awe which a child might have for the Great Mogul, the Khan of Tartary, or some other grand puissance he has heard very much about, but has never understood. At half-past seven in the evening I consigned myself to the keeping of this Grand Trunk. A large, ugly-looking, dirty, covered-in raft of a steam ferry boat conveyed me and my impedimenta across the river, and I there first made the acquaintance of another renowned invention of the New World—the Pullman Silver Palace Drawing-room and Sleeping Railway Car. This affair was fitted up, according to the advertisement phrase, "regardless of expense;" it was really magnificent. I took my seat and awaited with a great deal of curiosity the time to go to bed, for I saw nothing of beds, or any arrangement which gave the slightest indications of sleeping accommodation. I also saw no indication of moving, and began to think that this Grand Trunk was possessed of some magic, by means of which it could transport us to Montreal without the necessity of getting up steam, and that Pullman was a minor magician in his own line. But about an hour after the starting time from Quebec proper, on the other side of the river, we began to move out of the station at a rate which by no means impressed me over-favourably with the magic powers of locomotion possessed by this self-same Grand Trunk; and a short time after, Pullman's magic art became to me plain and simple machinery. An ebony-skinned son of America came to four seats placed in pairs *vis-à-vis*, gave a pull upon the cushions on either side of him, and the bottom ones came together in the space between the seats, while the back ones took the places of these, making a very fair sort of arrangement on which to place a bed. From underneath came pillows; a handle above was pulled, and what had appeared to be the ceiling of the car came down to within about three feet of the transformed seats. Out of the hiding place thus brought to light came two mattresses, one of which found its place upon the seats below, and the other remained for those who should sleep in the attic. Sheets, pillowcases, blankets, and all the appliances for two well-appointed beds, came from the same place; a polished walnut partition also was disclosed, which afterwards served to divide these beds from their neighbours; and heavy red curtains fell down in front of the two beds, separating them from the rest of the carriage. Everything was luxurious, and so far it was as complete as one could wish; but I waited in vain for some further magic which should disclose a dressing-room or some necessary means of utilising the goods already provided. Failing this, and all the seats being rapidly appropriated, I was compelled to crawl inside the curtains and lie down in my clothes, and I remained there, about as uncomfortable as possible, till morning. The very provision so bountifully made for comfort, which a lady under such circumstances could not possibly enjoy, made my position still more intolerable. There was too little room between the upper and lower story for sitting upright in bed, and the motion of the carriage was disagreeable—much more so than if I could have resumed the ordinary sitting posture. I had had a rather severe time of it in crossing the ocean, and in a little while I experienced a sickness of the same description as the most violent ailment which had made my sea voyage so unpleasant. It threatened so constantly, that it made me more miserable than even the more imperative commands of Father Neptune. At the earliest possible moment in the morning I was out of my place of confinement and looking from the windows, in hopes of discovering some signs of arriving at Montreal; but the train moved slowly on, and did not arrive until more than three hours after time. Before we came to our destination the train passed through a long narrow iron passage; through occasional holes of about the size of a tea saucer came blinding flashes of light, to be followed by darkness, and then by other like flashes. A mile or more of this progression, and we had

passed through the world-famed Victoria Bridge, said to be the great engineering achievement of the age. In a little time more we were in Montreal, having taken fourteen hours and a half for a journey of 185 miles.

I arrived in Montreal just in time to see something of a grand ceremony which demonstrates the strong hold that Romanism has upon the French and Irish inhabitants of the Dominion—I refer to the "golden wedding" of Monseigneur Bourget, the Bishop of Montreal. The most reverend gentleman had been married to the Lord for fifty years. Months had been spent in preparations for the great festival; and every priest felt it incumbent on him to be as active as possible in furthering the work.

The event was heralded by the presentation of forty-seven addresses, exhausting the possibilities of eulogy. The delivery of these was commenced some days beforehand, and was proceeded with from time to time, as human flesh had strength to bear them. Each instalment of the tiresome but not altogether unpleasant tribute was accompanied by something more substantial than words, the contemplation of which must have materially assisted Monseigneur Bourget's powers of physical endurance. Shortly before nine o'clock the joyous clangour of the bells of the churches announced that his lordship had left his palace. In a resplendent carriage, presented with one of the addresses, he proceeded in triumph to the cathedral church of Notre Dame, an immense pile in the heart of the city, which had been decorated without and within for the occasion by the loving, long-continued, and artistic work of many devotees. Illuminated texts of Scripture, skilfully used in honour of "Monseigneur," reminded one forcibly of the great festival of the Saviour.

The High Mass was as magnificent as Roman Catholics know how to make it, and the sermon of the Vicar-General was as pronounced as a syllabus of the sovereign Pontiff. Great *défilé* was given to it by the presence of several bishops, and several hundreds of the minor clergy. This was followed by a grand banquet, which added immensely to its social importance. As no military but that of bishops and clergy was tolerated there, I can only speak of it at second-hand. A small detachment of genuine Papal Zouaves guarded the doors, and my host, who catered for the occasion, assures me that about 750 guests sat down at the tables; and the general report confirms his statement, and adds that the affair was the grandest of the kind that has ever taken place in the Dominion.

Banners, festoons of cloth, and inscriptions adorned the streets, which were crowded with people, and illuminations, which I thought rather tawdry, brought the whole thing to a close.—*Cor. Queen.*

Art and Literature.

George Sand's new story is called "Le Chateau de Picterdu."

A literary curiosity, "The Poems of Mary Queen of Scots," is in preparation.

Professor Tyndall's American lectures will shortly be published in London.

The *Athenæum* says that a new poem may shortly be expected from Mr. Browning.

The book written by Marshal MacMahon, "De Paris à Sedan," has made its appearance.

A statue of Savonarola is about to be erected in the church of the convent of San Marco, at Florence.

A novel by the Princess Mathilde Bonaparte, entitled "La Dame à la Rubine," will shortly be published.

A translation, by Mrs. Arthur Arnold, of Senor Emilio Castelar's work, "Recollections of Italy," will appear shortly.

Mr. N. Chevallier has received from Her Majesty a commission for a picture of the interior of St. Paul's on Thanksgiving Day.

Dr. W. H. Russell's "Diary of the War," which appeared in parts in the *Army and Navy Gazette*, will shortly be published in one large volume.

The work which M. Victor Hugo is now completing, at Guernsey, it is said, will be entitled "Quatre-vingt-treize," and will deal with the second period of the French Revolution.

It is reported that in digging the foundations for an hotel at Athens, the workmen have discovered the remains of the Palace of Adrian. Two statues have also been brought to light.

Earl Russell's long-promised book on Christianity was to have appeared last month. Its full title is, "The Rise and Progress of the Christian Religion in the West of Europe, from the Reign of Tiberius to the end of the Council of Trent."

The French Government are going to send sixty-three pictures out of the Luxembourg to the Vienna Exhibition. Amongst them are Henri Regnault's "Moorish Execution," his equestrian portrait of Marshal Prim and Bertrand's "Virginia Drowned."

The publication of a great literary and scientific work has been commenced by M. van Bemmelen, professor at the University of Brussels. It bears the title "Patria Belgica," and is to comprise all that is known about Belgium. When completed it will form three large volumes, and be divided into three parts: 1. Belgium physically; 2. Belgium politically and socially; 3. Belgium morally and intellectually. Seventy contributors are engaged on the work.

A most interesting personal relic of the illustrious John Evelyn has just come to light. It consists of a MS. volume of prayers, entitled "Officium Sancte and Invidue Trinitatis; or, Privat Devotions composed and collected by John Evelyn for his annual and quotidian use, with calendar table, &c." The date is 1650. The volume is bound in old crimson morocco, with John Evelyn's crest and monogram on the back and on the right corners of the sides. It was presented by Evelyn to Mrs. Godolphin, "his most excellent and estimable friend," and contains many curious MS. notes by her.

A fine collection of old books is to be sold in London in the course of the present season. It has been valued at something like £10,000, and includes rare illuminated manuscripts, large paper county histories, and other gems that will excite covetous desires in the heart of many a collector. Among them is a matchless copy, printed on vellum, of the Mazarin Bible, the first edition of the Scriptures, and supposed to be the first book issued from the press of Gutenberg printed with movable type. With several other Bibles of great rarity is Coverdale's English translation, printed in 1535, a copy of which, with the title and first leaf in facsimile, was sold by auction twenty years ago for £365. Then comes a splendid manuscript of Lydgate's "Siege of Troy," the very copy which the poet handed to his Royal patron King Henry V. There are innumerable works from the presses of Caxton, Pynson, and Wynkyn de Worde.