

Science & Mechanics.

(Written for the "Canadian Illustrated News.")

A GOSSIP ABOUT CLOUDS.

"Sometime we see a cloud that's dragonish;
A vapour sometime like a bear or lion,
A tower'd citadel, a pendent rock,
A forked mountain, or blue promontory
With trees upon't, that nod unto the world
And mock our eyes with air; thou hast seen
these signs?"

They are black vesper's pageants."

—ANTONY AND CLEOPATRA.

In "The Castle of Indolence," Thomson's man of special grave remark—one of the idle, useless, gentle tenants of the place—a dreamer on the clouds:

"Oft as he travers'd the cerulean field,
And marked the clouds that drove before the wind;

Ten thousand glorious systems would he build,
Ten thousand glorious ideas fill'd his mind;
But with the clouds they fled, and left no trace behind."

The sky belongs to the landscape, with its continents and lands of cloud, in which the bolt of heaven is forged, and the fructifying rain is condensed,—where the cold hail concretes in the summer cloud; these clouds, the balancings of which are mentioned in Holy Scripture as a part of the wondrous works of Him who is perfect in knowledge, ought not to be to our readers a subject of tame and unfeeling contemplation.

The clouds are full of poetry, life and beauty; they have never failed to arrest the poet's eye or gild the painter's canvass. The chariots of flame and the horses of fire that bore Elijah from the earth rested on the clouds. David, in the eighteenth psalm, speaks of Jehovah riding on the cherubim and flying upon the wings of the wind, making darkness His secret place and causing thick clouds to cover Him. "The lazy-pacing clouds, sailing on the bosom of the air," upon which is a winged messenger of heaven, which the wondering eyes of mortals fall back to gaze on, are converted into exquisite poetry by Romeo. Again, how beautiful is Friar Laurence's description of the sun advancing his burning eye the day to cheer:

"The grey-eyed morn smiles on the frowning night,
Chequering the Eastern clouds with streaks of light;

And flecked darkness like a drunkard reels
From forth day's path, and Titan's fiery wheels."

And what are these clouds detached in ranges through the air—some spotless as snow and light as feathers, others dark and threatening with broad summits and sides resembling lofty towers? There is abundance in them to raise and stimulate the curiosity, although they are popularly termed a visible aggregate of minute particles of water suspended in the atmosphere.

The clouds may be said to give the varying countenance of the sky, and in their connection with atmospheric changes consisted the popular meteorology of the ancients, the accuracy of whose observations with respect to the prognostics of the change of weather have been verified by those of more modern meteorologists.

Clouds, according to Howard, are distinguished by seven modifications, the peculiarities of which seem to be caused by electricity, for example, three primary modifications, the *Cirrus*, the *Cumulus*, and the *Stratus*; two, which may be considered as intermediate in their nature, the *Cirrocumulus* and *Cirrostratus*; one which appears to be a compound, the *Cumulocirrus*; and lastly, the *Cumulocirrocumulus* or *Nimbus*, a state which immediately precedes the resolution of clouds into rain.

Cirrus is composed of fibres, or wisps, or curling streaks, in appearance like a lock of hair or a feather, sometimes resembling a brush. It occupies the greatest elevation in the zenith—immediately overhead—and is vulgarly known as "mare's tails." Foster, a well-known writer on meteorology, is inclined to believe that under whatever form *Cirrus* may appear it must always be regarded as a conductor of the electric fluid.

Cumulus is a convex aggregate of watery particles increasing upwards from a horizontal base. *Cumulus* is the cloud of the day, and is most characteristic in fine summer weather; it varies in shape and dimensions. This cloud is a pretty well defined hemispherical mass. In changeable weather it evaporates almost as soon as formed, or quickly changes into other formations. It may have been the cloud to which Hamlet refers in his dialogue with Polonius:

Ham. Do you see yonder cloud, that's almost in shape of a camel?

Pol. By the mass, and 'tis like a camel, indeed.

Ham. Methinks it is like a weasel.

Pol. It is backed like a weasel.

Ham. Or like a whale?

Pol. Very like a whale.

Sometimes the *Cumulus* assumes the form of a mountain ("a forked mountain") or denotes a white, rocky surface upon a horizontal base ("a tower'd citadel, a pendent rock"). It generally preserves its plane base because it floats on the vapour plane, or at that precise elevation at which the air has as much water in solution as from its quantum of heat and pressure from above it is able to contain. Whether the conical form of this cloud is to be attributed to the attraction of aggregation alone, or whether something particular in its electric state may also be concerned, is not absolutely determined.

Stratus is an extended, continuous level sheet or streak, the lowest of clouds, and may be

termed the cloud of night. It forms at sunset and disappears at sunrise, and forms, or rather helps to form, those streaks of light when "the golden sun salutes the morn." As the temperature decreases in autumn the *Stratus* becomes thicker, the rays of the sun seem hardly able to overcome it, and it sometimes lasts through whole days; thus it gave rise in the minds of the ancients, whose organization led them to express physical facts metaphorically, to the fable of Phœbus and Python. The *Stratus* may be "the lazy-pacing cloud that sails upon the bosom of the air."

The *Cirrocumulus* is intermediate between the *Cirrus* and *Cumulus*, and is composed of small, rounded masses, apple-shaped, and forming a net-like appearance. It is not always uniform in its appearance; it varies in the size and roundness of its constituent nebulae, and in their closer or more distant arrangement. It is frequent in summer, and often forms very beautiful skies.

The *Cirrostratus* is composed of bands of filaments resulting from the subsidence of the fibres of the *Cirrus* to a horizontal position, as they approach each other laterally. These clouds form horizontal strata and exhibit the phenomena of the solar and lunar halos. The prevalence of the *Cirrostratus* is usually followed by bad weather.

The *Cumulocirrus* is composed of cumulus clouds heaped together, frequently into a pyramidal shape, increasing in density. When this cloud assumes a bluish or black tint near the horizon it is ready to pass into *Nimbus*. Before thunderstorms it seems frequently reddish, which some people have imagined to arise from its being highly charged with the electric fluid.

Nimbus is the rain cloud. It is dense, and of a uniform black or grey tint, in a horizontal sheet with fringed edges. The application of the word *Nimbus* corresponds very well with the sense in which it was taken by the old Roman writers, who considered it as a storm cloud, and distinguished from *imber* or a shower of rain actually falling.

Those who wish to study the subject more fully cannot do better than read Howard's essay on "The Modifications of Clouds," or Foster's "Researches about Atmospheric Phenomena." These may possibly lead them to take delight in observing and comparing facts connected with meteorology, and to the investigation of the respective causes of different phenomena. If they do, they will obtain thereby an adequate reward for their labours.

An interesting paper read by Dr. Stevenson Macadam at the meeting of the Royal Scottish Society of Arts recently tends to show that flourmills are almost as dangerous neighbours as gunpowder mills, there being nothing under present arrangements, especially of large flourmills, to prevent explosions at any moment. The chemical components of grain are combustible when burned in the ordinary way, and are consumed with greater rapidity when diffused as a cloud through the air. When flour is showered from a sieve placed above a gas flame rapid combustion takes place. Indeed the flour burns with explosive rapidity, and the flame licks up the flour shower somewhat in the same way that it flashes through a mixture of gas and air, or that it treads along a train of gunpowder. When burned the flour resolves itself into gases. The carbon, by mixing with the oxygen of the air becomes carbonic oxide or carbonic acid, and the hydrogen and oxygen become water, vapour, or steam. The volume of these gases is much increased by the high temperature at the moment of combustion.

The conditions required to bring about a flour explosion are somewhat similar to those which cause a gas explosion. Flour agrees with coal gas in being simply combustible when unmixed with air, and equally agrees with coal gas in being explosive when mingled with air, but the fine impalpable dust must be diffused through the air in definite proportions in order to constitute an explosion when a white heat, such as a flame or spark, is brought near. In order to bring about an explosion it is also necessary that the flour mixture be more or less confined within a given space. The more common way of the production of the spark or flame which fires the flour-air explosive mixture, is the feed going off the stones doing work when the stones set down on each other, and as they are of a flinty or other hard siliceous rock, and are revolving at from 100 to 160 revolutions in a minute, they quickly strike fire and become very hot. The feed may go off from want of grain in the hopper or any obstruction in the feed pipe. A spider's web actually stopped the feed in one case, and led to a violent explosion in an English flour-mill. Dr. Macadam suggests various expedients to be adopted for avoiding flour-mill explosions, such as the removal of exhaust boxes, stove rooms, smut rooms, and other receptacles of flour dust to the outside of the mill, and expresses a hope that all proprietors of flour-mills will awaken to the necessity of adopting precautionary measures in future, inasmuch as they cannot now plead ignorance of the explosive force of the flour-air mixture.

In Paris tin-foil is coming into use as a substitute for wall-paper. Its cleanliness, its extreme flexibility, the care with which it can be moulded, and the fact of its being entirely water-proof, commend it to public attention. In Paris the tin-foil is cut into widths of about thirty-five inches, and in lengths in somewhat more than five yards. This is painted over by a patented process. What we most need now, in our paper hangings, is to get rid of the paste that is at present used. This sticky, disagreeable substance is far from healthy in itself, especially when exposed to the effect of damp walls. It will also contain contagious diseases for years, wherever by any chance the germs can penetrate behind the paper. Can no substitute be found?

Courrier des Dames.

PARIS FASHIONS.

The Parisian correspondent of *Land and Water* gives some seasonable hints on the dress question which may interest our lady readers.

MOIRE ANTIQUE.

Moire antique, which has for so long been out of favour, has suddenly become once more in fashion—not that satin is thereby quite dethroned, on the contrary, it seems to gain additional lustre by comparison with the heavier effects of moire, which indeed is better suited to ladies of mature age than satin. The two combined, however, are very effective, and if any lady should happen to have an old moire dress with which she has not known what to do for many long years past, let her bring it forth from its hiding-place, and I will tell her how to convert it into a new and fashionable costume. Unpicked it must of course be to commence. This done, make up the skirt again, minus the front width, and edge it all round with a ruching of velvet or satin, according to the under-skirt with which it is to be worn. The front width will make or help to make a body with basques, but no sleeves, and the body will be trimmed to match the skirt. The under-skirt may be of black velvet, or black quilted satin, or even of coloured velvet or satin to match the moire, and the sleeves of the body will match the velvet or satin under-skirt. The moire skirt will be looped up at the sides, with bows to match the under-skirt, and a wide sash, to match the bows, will hang at back from under the basques of the body. An Elizabethan frill of white lace will be worn round the neck of the dress, whether it be made high or pointed, and the wrists of the sleeves will be likewise finished with lace ruffs. Add to this a black velvet dog-collar, with pendant round the neck, and a bow, to match sash, in the hair, in the centre of which you may place a pin to correspond with the neck-pendant, and you have a dinner toilette fit for any occasion, under the greatest gala; and this may be contrived with the help of two partly "used-up" dresses. Indeed, with a little trouble, a lady may be elegant at a very trifling cost; for it is not always the most expensive dresses which look the best, and often the most simple materials, prettily made, will outshine the richest costume.

BALL-DRESSES.

But we must now come to ball-dresses, which are already beginning to occupy the ladies' minds, though as yet no invitations for Paris are issued; but that does not prevent other countries from dancing, consequently ball-dresses are just now very interesting topics of boudoir conversation. Firstly, as a ball-dress can rarely be worn more than once, all that is needed for it is freshness and taste. Tulle, crape, silk, or velvet skirts; these are the universally adopted materials for those who dance, and the more cloudy and transparent a ball-dress is the better it looks. Heavy silks and velvets are reserved for the non-dancers. The way ball-dresses are made this season is to put three or four skirts one upon another, with crape scarfs to loop those skirts up. Four skirts and four scarfs are the average, which are so twisted and blended together that it would be impossible to describe the arrangement, though the effect is airy and charming beyond conception. Very few wreaths are worn now, owing to the present fashion of doing the hair, which does not admit of anything beyond a stray flower, bow, or pin placed here and there among the folds of the hair. Children have quite disappeared, and the hair is worn so as to expose the back of the neck. In front, however, the hair remains as high as ever, and in some cases looks like a pyramid of tufts and curls. Amongst this labyrinth of curls I have lately seen some ladies wear three velvet bands embroidered with steel, gold, or diamonds, and they gave a very Grecian look to the head. Little bouquets are placed on the body at the left side, near the shoulder, and in some instances on the shoulder itself, when they take the place of a sleeve. Scarfs of flowers are also among the novelties of the season, which, crossing the bodice from shoulder to waist, finally loop up the skirt on left side. This is very elegant and becoming to slight figures.

The Paris correspondent of the *British Medical Journal* writes that the medical courses there are now open, and that three or four ladies are attending *cliniques*. "They are modest, well-informed and intelligent ladies, and are much respected and kindly received by the professors; and our students, turbulent as they are, know how to respect those who come among them as strangers appealing to their gentlemanly souls, and show a better example than your riotous students of Edinburgh."

Miss Emily Faithful writes in the *Fireside Companion* in answer to the question, "What can be done for poor single women?" give them all a trade. She thinks telegraphy, photography, phonography, wood-engraving, watch-making, and type-setting among the more appropriate vocations for women. In England, owing to trades-unionism, women will not be admitted to learn or follow the trade of watch-making, though one extensive watch-maker said that woman's delicacy of touch was a necessity to him, and he therefore sent to Switzerland to have the part of his work done which required that delicacy. Miss Faithful found great difficulty in finding employment for female wood-engravers in England. She says that "we want schools of design and technical schools. At present women are 'nowhere in the race,' not from inherent deficiency, but from the absence of special training."

News of the Week.

THE DOMINION.—Complaints are being made of the state of the quarantine regulations at Halifax. An extra of the *Gazette* contains a notice enforcing the quarantine regulations at all the ports, and constitutes all the Collectors of Customs quarantine officers. A letter from the light-house keeper on Red Island, Gulf of St. Lawrence, states that he never witnessed such a stormy season as the present one. The sea swept almost everything from the island, breaking the flagstaff and swallowing up every stick of his winter supply of wood, making it necessary to chop up a building for firewood.

UNITED STATES.—The sentence pronounced on Foster, the car-hook murderer, has been confirmed by the Court of Appeals. A bill has been reported in the Senate giving bounties to steamers built in the United States, and providing for steamship lines to Europe, the West Indies, Mexico, and Australia. Wall Street men are making efforts to secure the appointment of a New York man as Secretary of the Treasury in the place of Boutwell. Reinforcements have been sent from San Francisco to assist in carrying on the Medoc war. It is reported that the new ten million Erie loan has been taken up in Europe.

GREAT BRITAIN.—Prince Napoleon will for the present be known as Count Pierrepont. The ex-Empress Eugenie and Prince Jerome Napoleon are to be his political guardians. Messrs. Onslow and Whaley, members of Parliament, have been fined £100 each for publicly accusing Sir John Duke Colridge of conspiring to deprive the Tichborne claimant of his rights. An order of contempt of Court has further been issued against Mr. Onslow for repeating his offence. Captain Trocks, of the SS. "Germany," recently lost off the mouth of the Gironde, has been exonerated from all blame in the matter. The statement that Count Schouvaloff failed in his mission to secure the co-operation of the British Government in the measures contemplated by Russia and Central Asia, is denied in the *London Telegraph*. The "Northfleet," an emigrant ship which sailed from Britain for Australia, was run into by an unknown steamer in the English Channel, and it is supposed that of four hundred and twelve persons on board over three hundred perished. The name of the vessel which ran down the "Northfleet," is variously stated as the "Pelaya" and the "Marillo."

FRANCE.—There are further rumours of a fusion between the Legitimists and Orleanists. The Franco-German boundary commission have brought their labours to an end. Three more Communists have been shot at Satory, and three have escaped from prison at Versailles. The trial of Marshal Bazaine will begin in the latter part of April. The Seine is again rising. Bazaine has found a defender in General Manteuffel, who, in a recent speech delivered at Metz, dwelt in terms of generous praise on the bravery displayed by the Marshal, which he declared was quite equal to that of any general in the German army. The committee of Thirty have agreed to an amendment proposed by M. Decadès to the first article of the constitutional project reported by its sub-committee whereby the President is allowed to address the Assembly only on the bills before it.

GERMANY.—The Court has gone into mourning for one week for Napoleon.

AUSTRIA.—The Vienna Exhibition will open in May.

SPAIN.—The Cortes have been debating on a bill providing for compulsory service in the army. The Court has gone into mourning for one week for Napoleon. The special committee on the abolition of slavery in Porto Rico, propose that the emancipation of the slaves shall be complete by four months after the promulgation of the passage of the bill.

ITALY.—Prince Arthur is in Rome. The American emigration fraud has been brought up in the Chamber of Deputies. A plenipotentiary from Uruguay is expected at Rome to settle the long standing financial dispute between Italy and that country.

RUSSIA.—The Grand Duchess Helene Pavlovna is dead. She was born in 1807. The *Official Gazette* states in confirmation of the various rumours circulating in the country, that there are no important differences in the views of Great Britain and Russia with regard to the present movement in Central Asia.

SWEDEN.—The annual session of the Swedish Diet was opened on the 29th ult., by the King in person.

SWITZERLAND.—The Rev. Dr. Pusey is dangerously ill at Geneva.

EGYPT.—A contract of marriage has been signed between the hereditary Prince of Egypt and the daughter of Elhavi Pacha.

SOUTH AMERICA.—An attempt has been discovered to blow up a train in which the President of Peru was travelling.

CUBA.—Havana Government advices deny that any filibustering expedition from San Domingo has landed. The political aspects of the Island are assuming a more threatening attitude.

A grand meeting of savants, English, French, German, and Russian, was to have been held in Paris this month. The astronomers delegated by the various powers to observe from different parts of the world the transit of Venus over the sun's disc, which will take place in 1874, were to congregate here to determine the exact points of observation. A grand banquet, under the presidency of M. Faye, will be given, it is said, to the visitors.