

their poorer brethren may be lifted up into a higher and better life.

The movement is in a flourishing condition in this neighbourhood. There are, in this county, besides the Wentworth Division Grange, several subordinate, or township granges.

It will be seen that the grand aim of this organization is to promote a higher moral, mental and social standing among the people, and growth in this higher manhood will be accompanied by material progress. The "buying and selling" aspect of the question is only an issue, one branch of the mighty tree, which is spreading its sheltering limbs over the parched land. And if there is any justification for the existence of Boards of Trade, by which commercial men may combine to look after their own and the country's mercantile interests, there can be no legitimate reason why farmers should not amalgamate to promote the welfare of the agricultural pursuit.

In conclusion, I have but to say, that a natural fondness of the country—an inbred love of rural felicity—and an earnest desire to see the "tillers of the soil" happy in their noble pursuit, enjoying adequate returns for their labor, and reveling in that princely independence which country life alone affords, has prompted these few rambling remarks.

W. F. McMAHON.

Hamilton, Ont.

ANOTHER CANADIAN ASTRONOMER.

I was impressed with a feeling of deep surprise on coming across the article entitled "A New Astronomical Theory," which appeared in the last issue of your paper. I will state presently the reason why I felt so surprised.

For the last ten or twelve years I have given much thought to scientific subjects, and endeavoured, as far as the nature of my avocations and means of acquiring knowledge allowed me, to keep abreast of the scientific movement of the day. Astronomy was my favourite study. I was strongly induced to give a special attention to that particular branch of science from the predilection I felt for it and from a hope that, by dint of thought and application, and following the inductive method of reasoning, my efforts would end in the discovery of the true nature of that mysterious universal force called gravitation. I was immeasurably ambitious in my aims, you will say, and little conscious of the nature of my search, but in whatever light my efforts may be considered, such was really the end I was aiming at.

One thing greatly increased my hope and confidence in the success of my undertaking. I felt confident that studying Nature in the light of the doctrine of the Correlation of Forces, or Conservation of Energy, which has lately assumed great prominence in the world of thought, could not but lead, sooner or later, to the solution of the difficulty, and I accordingly directed my thoughts with a certain degree of earnestness in that particular line of study. The idea of unity in matter and force soon became the prominent one in my mind, and I strove to trace it up and realize it in the domain of Nature, being almost certain that, in case of success, the ultimate object would then be within my reach.

And now, shall I say it?—I am profoundly convinced, however wrong I might be in my judgment—I am profoundly convinced that I have attained the end I had in view, and this I say, being fully conscious of the almost awful importance of the claim I have concluded to lay before the public.

There is one reason above all others which induces me to step forward and lay my claim without further delay. Your readers will admit that the reason is strong and urgent. The conclusion I arrived at as to the inner cause of the orbital motion of the planets is precisely the same as that which Mr. Macdonald has come to in his pamphlet, and, with the exception of, I must say, a very important particular, is based on the same reasons he adduces in support of his theory. I have not had the pleasure of reading the pamphlet, nor heard anything about Mr. Macdonald's astronomical views before. I read your comments upon it, but the summary you have given of it sufficiently brings out the tenor of his reasoning. I said with the exception of a very important particular. I cannot agree with Mr. Macdonald in his statement that "the heat of the sun causes the motion of the medium" in such a manner that the medium impressed by the solar heat reacts upon the sun and causes it "to revolve on its axis, as well as the planets." I hope I do not misunderstand his statement. As I apprehend it, it can be shown, I think, that it clashes with a fundamental law of Physics, viz., Action and Reaction are equal. If Mr. Macdonald can maintain his position on this point, he can show that, in the appliance of the lever, the fulcrum can be dispensed with. The nature of heat is no longer involved in mystery. Through the researches of such men as Joule, Rankin, Tyndall, Forbes, Mayer, Melloni, Clausius, and other celebrities in the scientific world, such light has been thrown on the nature of heat as to make it amenable to physical laws, and bring its force within the limits of calculation. To Dr. Joule, of Manchester, is due in main part the precise determination of the Mechanical Equivalent of Heat, and science measures now by the foot-pounds, or reckons in units of work the amount of force that can be evolved, for example, from a ton of coal or a log of wood (I presume that it would have to be measured first and its nature ascertained) when subject to the process of combustion. This reduction of

heat to a mechanical equivalent, the drift of the dynamical theory of heat which has now superseded the mechanical theory, the law of the Correlation of Forces, all combine to show that the law: Action and Reaction are equal, has as much to do with heat as with any other of the physical forces, not excepting electricity itself. If the sun through its heat imparts motion to the medium that surrounds it, that medium cannot give back that motion to the sun without coming itself to rest. The sun or the medium must be in turn the fulcrum on which the lever of heat can operate, and I need not add that it is essential for a successful operation, that the fulcrum itself be at rest. But Mr. Macdonald will say that the motion imparted by the sun through its heat to the medium is restored to the sun converted into a motion of a different nature, and that it is this new form of motion (now rotation of the sun on its axis) which, being imparted anew to the medium, sends it circling round the sun, and with it all the planets in the solar system. This, if there is any truth in the doctrine of the Correlation of Forces, does not alter the state of the question. The sun cannot get back from the medium more than the equivalent of force or motion, no matter under what form, that he imparts to it; and if that equivalent of motion or force, which can be nothing else than the reaction of his action on the medium, be sufficient to make it revolve on its axis, the medium must oppose an equivalent of resisting force, which it could not do if it revolved itself with the sun. The medium cannot play the part of the lever and the fulcrum at the same time, no more than the sun and the solar heat. By Mr. Macdonald's reasoning one would be led to think that the "king of fire" is moving in a vicious circle. In my opinion, the action of the solar heat on the medium causes the phenomenon of light. The Wave-Theory of light warrants me to say so. As to the existence of the medium, which is the groundwork of Mr. Macdonald's theory, it will not be met with disapproval on the part of science. It can be nothing else than that highly elastic medium called ether, which is the base of the undulatory theory of light. This ether may be shown, perhaps before long, to be earth matter, and that not in its most refined state either, but coarse-grained in a degree sufficient to leave some impression when sent by solar heat battering against the retina!

I am of opinion, Mr. Editor, that the true cause of the sun's revolving on its axes must be sought out of the solar system, somewhere in the starry vault of heaven. It is a cause analogous to that which causes the earth to revolve on her axis, or any of the primary and secondary planets revolving on their axis in their respective orbits. It is analogous, but not the same. I think it can be shown that the cause of the moon's rotation on her axis comes from the earth revolving in her orbit, that the earth's rotation on her axis is due to the sun's motion in his orbit, and that his own rotatory movement is caused by the orbital motion of that sun, or system of suns, around which our own sun, himself subject to the law of gravitation, is made to sweep the boundless space. If that holds good for our sun and his system, by induction, it must be law as well for all the heavenly bodies revolving in the star depths, to the very centre of the universe. The ultimate cause of all this complication of motion lies in the arm of the Almighty.

I am sorely trying your patience, Mr. Editor; please bear with me a little while longer. Although the conclusion I arrived at as to the motion of the planets in the solar system, considered in relation with Mr. Macdonald's, might, if not materially confirm his views, draw at least more attention to the subject, yet I could not with good grace step forward now and make the statement that I, too, came to the same conclusion, unless I had something to show in support of my claim. With your permission, I will say what I have yet to say in the matter. It is the cause that led me to write at all, and on the strength of which I have concluded to lay a claim before the tribunal of science, which, on account of its high importance, I would be very unwilling to make, were it not that I am profoundly convinced of the tenableness of my position.

Having realized, as I thought, the idea of unity in matter and force, I elaborated thereon a theory, on which, in my opinion, all the phenomena of inorganic nature are explainable. If all the phenomena, I have to include, of course, electricity, positive and negative, with its complication of currents; terrestrial magnetism, with all its features, including the manner and variation in place of the magnetic poles, the aurora borealis and zodiacal light; the fall of aerolites, and whence they come; what causes the planets to grow, and whence they draw their substance, and last, but not least, the law of universal gravitation.

I was engaged comparing my notes and drawing them in a suitable form to lay my claim before the proper tribunal, when your article, announcing Mr. Macdonald's theory, came as a thunderbolt upon me, and left me almost no other alternative but to make my own views public, and that as soon as I possibly can.

The little pamphlet I am preparing for publication bears the title: "The Earth, Ever Changing and Ever the Same," with the first verse of Genesis on the title page. As it was not intended for the general public, I do not claim that its form is the most suitable to that end.

Thanking you, Mr. Editor, for your valuable space, I remain, &c.,

ABBE DOUCET.

Inkerman, Co. Gloucester, New Brunswick.

HOLIDAY GAMES.

GATHERING OF THE CLANS.

Have in readiness a pack, all the cards of which are well arranged in successive order; that is to say, if it consist of fifty-two cards, every thirteen must be regularly arranged, without a duplicate of any one of them. After they have been cut (but do not suffer them to be shuffled) as many times as a person may choose, form them into thirteen heaps of four cards each, with the coloured faces downward, and put them carefully together again. When this is done the four kings, four queens, the four knaves, and so on must necessarily be together.

THE SHUFFLED SEVEN.

Desire a person to remember a card and its place in the pack; then in a dexterous manner, convey a certain number of the cards from the top to the bottom; and subtract them in your mind, from the number of the pack; for example, the pack consists of fifty-two cards, and you have conveyed seven to the bottom; tell the person the card he has thought of will be the forty-fifth, reckoning from the number of the card, the place of which he has to name; thus, if he say it is the ninth you go on counting nine, ten, eleven, &c., and the card he thought of will be exactly the forty-fifth as you announced.

THE NOTED CARD NAMED.

Take any number of cards, ten or twelve for instance, bear in mind how many there are, and holding them with their backs toward you, open four or five of the uppermost, and, as you hold them out to view, let any one note a card, and tell you whether it be the first, second, or third from the top. Now shut up your cards in your hands, and place the rest of the pack upon them; knock their ends and sides upon the table, so that it will seem impossible to find the noted card; yet it may be easily done—thus: Subtract the number of cards you held in your hand from fifty-two, the whole number in the pack, and to the remainder add the number of the noted card, which will give you the number of noted card from the top.

THE COACH.

Is a capital Christmas game, and suitable for any period of the year, when a large family party are assembled. It is played as follows:—One narrates an adventure, in which a coach and its appointments are the prominent figures. The rest assume the names of these; one is "the coach," another "the hind wheels," a third "the front wheels," a fourth "the doors," and so on for "the panels," "the box," "the coachman," "the four horses," "the leaders," &c., till all are settled, when the narrator begins a story. Whenever mention is made of the above names, the one so designated must jump up and turn round before resuming his or her seat; but when "the coach" is named all rise up, and turn round twice, otherwise a forfeit is exacted from those who omit it. The game is nothing without a narrator, who contrives to bring in as rapidly as possible all the various names, and to keep the whole party in a constant bustle.

THE TWELVE TRAVELLERS.

This is a feat similar to the foregoing, and depending on the same principles. You volunteer to put twelve travellers into eleven beds, so that each may have a bed to himself. This you do by producing eleven wafers or counters, and placing them in a line upon the table. Then you begin by saying, "I put two travellers into the first bed, the third into the second," and so on up to the tenth, where you will have placed the eleventh traveller, and yet have one bed empty. You now take the extra traveller away from the first bed, which had two, and place him in the eleventh bed, by which means you will seem to have accommodated the twelve travellers singly in eleven beds.

LITTLE BASKET.

This game will do when a rest is required. Let the company sit, forming a circle, and the first person is to say, "I have a little basket," the next must reply, "What did you have in it?" The first person must then mention something beginning with the letter A, before the second person has finished counting ten, or a forfeit will be required. The second person then puts the same question to the third and so on, until A has gone round; then B, C, D, and the whole of the alphabet.

THE GAME OF CONSEQUENCES.

This is best played by five persons, though six can engage in it. First obtain some white paste-board, or black cards, and cut them into thin slips, all of one size. There should be at least four dozen slips, but eight dozen will be better still, as the game will then be longer and more varied. We will, however, suppose that there are four dozen slips of card; first take twenty-four of these slips, and write in a legible hand upon each the name of one of the players; then take twelve more cards, and write on each the name of a place, as "in the square," "in the chapel," "in the orchard," "at a party," "at college," &c.; lastly, on the remaining dozen cards, write the consequences, or what happened to the young ladies; you may say, for instance, "they went to be married," "they were overtaken by a storm," "they were robbed on the way," &c., contriving the consequences that they shall not appear absurd or unmeaning.

When the cards are ready, the play may commence by one of the party taking the cards

which have the names (two names being read together), while another takes the cards that designate the places, and a third takes charge of the consequences; the cards should be well shuffled and laid in piles before each of the players, with the blank side uppermost.

TIERCE, OR TOUCH THE THIRD.

In this game the company stand two-and-two in a circle, excepting in one place, where they stand three deep, thus: One stands outside of the circle, and is on no account allowed to get within it. The object is to touch the third one wherever to be found; but, when attempting this, they dart in to the circle, and take a place before some of the others. Then the third one who stands behind becomes the object; but they likewise slip into the circle, and take the place in front of another. The pursuer is thus lead from point to point in the circle, for he must always aim at one who forms the outside of a row of three. Anyone caught changes place with the pursuer. This game affords charming exercise. Sometimes it is agreed that the pursuer may touch the third one with his or her handkerchief which is, of course, more likely to be effectual than touching with the hand.

POST.

A circle is formed, and each person fixes on the name of a town. All these names are written on a piece of paper, and one holds this, standing outside the circle as a reader. One of the party is then blindfolded, and stands in the centre. The reader cries, "I send a letter from London to Liverpool," or to any other two towns that have been chosen. The two who represent these towns must change places, and while doing so, Blindly tries to catch one of them. If she succeeds, the one caught is blinded. When "General Post" is called out, all must change places.

LACHINE CANAL ENLARGEMENT.

We again present our readers with two pictures of the works at St. Gabriel Locks (an important portion of this Branch of the St. Lawrence Canal Improvements), now being actively pushed forward by Messrs. Loss & McRae, contractors. The pictures are taken as follows:—One looking south-west, bringing prominently into view the stone-yard, occupying the upper portion of McGavran's Island. Here the cut stone is in progress of being prepared for the masonry structure; also are seen the various appliances for unloading the rough material from the canal barges and re-loading the same to carry it to its final destination in lock, bridges and other structures where required on this section.

The second picture looks north-east toward the harbor in the line of the canal, showing the present lock erected in 1845, and renewed last spring, also the new lock in course of construction, and the numerous extensive manufactories lining its banks are brought out with picturesque fidelity.

The contractors have made considerable progress since our former visit, some four thousand cubic yards being now completed at the new lock during a period of about two months' work; the previous portion of the season being occupied in preparing the foundations.

The amount of work in this contract contains about 300,000 cubic yards of excavation, 40,000 cubic yards of masonry and over 1,000,000 feet of lumber, with other items. About two-thirds of the excavation, one-fourth of the masonry, and one-third of the lumber structures are now completed.

The contractors are making extensive preparations to carry on the several works during the winter season, taking every advantage of the canal being now laid dry until the month of April next, when building operations will be resumed at the new lock and raceway adjoining. During the winter season the south lock wall and excavation between Wellington Bridge and the present lock are expected to be completed, and it is hoped the present laborers' strike on the canal will not seriously interfere with the proposed winter operations, but that some amicable and satisfactory arrangements may be entered into by the parties interested, strikes being generally injurious both to contractors and their workmen, also avoiding the necessity of stopping the manufactories which derive their power from the canal for another winter, and expediting the opening of the new enlargement, with all its advantages to the leading interests of Montreal.

The Lachine Canal enlargement is now being carried out under the charge of J. G. Sippell, Esq., Chief Local Engineer, with his staff of active assistants, this section being under the immediate inspection of Mr. John Sutcliffe, C.E.

The photographs are from beautiful originals by Henderson, of this city.

It is now very fashionable for a woman to remark that she has the heart disease, and that it is greatly aggravated by her husband's conduct.

A SWELL who stuttered horribly, paid court to a very pretty actress. "Ah, sir," said she, "life is too short. I haven't time to listen to you."

BEFORE they are married she will carefully turn down his coat collar when it gets awry; but after that event she'll jerk it down into position as if she was jerking a door-mat out of the window.