

suppose that they would hesitate to use that power upon occasion. But there are other parts of the United Kingdom which have waited almost as long and much more patiently for reforms which are to them of far greater present moment than the redressing of Ireland's real or imaginary wrongs. Take the case of Wales for instance. The existence of the Welsh Church establishment for the behoof of a small minority of the population is as glaring an injustice as was that of the Irish Church which was disestablished so many years ago. Nor is there any reason to doubt that the Welsh people are quite as much in earnest as were the Irish, in demanding the removal of the incubus so unfairly kept upon their shoulders. Of the thirty-four members from Wales, thirty-one are now, it seems, Liberals and strenuous advocates of disestablishment. Disestablishment was, so far as we can perceive, just as definite an issue in Wales as Home Rule in Ireland. The Welsh members will no doubt be reasonable and give the new Government a fair chance to get the Irish question out of the way. But what then? They have, as we have said, waited long; their patience has been severely tried, and they are now in downright earnest. A much smaller number than thirty-one of compact votes, would turn the scale. Hence Wales, too, is now, if it chooses, master of the situation.

SIR DANIEL WILSON.

BY the death of Sir Daniel Wilson, University College has lost an able, learned and devoted president, the University of Toronto a never-tiring and fearless supporter, and the world of letters one whose unique position none can fill. For he dies covered with honours, both literary and academical,—known to the world as an eminent archaeologist and *litterateur*, and to Canada as one foremost in the guidance, for many years, of our higher education.

From the standpoint of the knowledge of the world in general, the story of Sir Daniel's life can be told in a few words, and has been told a thousand times. His birth, in Edinburgh—his ever-loved city—in 1816; his early struggle in London; the publication of the "Memorials of Edinburgh in the Olden Time," in 1847; of "The Archaeology and Pre-historical Annals of Scotland," in 1851; his acceptance of the chair of History and English Literature in University College, in 1853; the appearance of his "Pre-Historic Man: Researches into the Origin of Civilization in the Old and New World," in 1862; of his Shakespearian study, "Caliban, or the Missing Link," in 1869; of his volume of poems, "Spring Wild Flowers," in 1873; of his "Reminiscences of Old Edinburgh," in 1885; of his work on "Anthropology," in 1885; of "William Nelson: a Memoir," in 1890; and of his recent work on "The Right Hand: Left-Handedness," and his articles in the *Encyclopædia Britannica*, and his study of "Chatterton"; these events make up to the general public the literary career of a man who, judged by such accomplishments alone, did that which entitled him to a most honoured place in the literature of this century. But, apart from all this, Canadians will long love and honour his memory as that of a single-minded and enthusiastic educationist, teacher and philanthropist, in the fullest sense which those terms can imply.

When Sir Daniel came, nearly forty years ago, to University College, he threw in his destinies with an institution insignificant indeed in comparison to that into which, during his time, it has grown. He, more astutely and more energetically than any other, has watched that growth, and guided its direction, defended his adopted University and College from attacks from without, and fostered their development within, until he is now able to leave to others the completion of a work already crowned with a marvellous success. It has been to him, for many years, a deep gratification to see the University by whose life he lived grow, step by step, into the complex and magnificent educational system, with the growth of which his name cannot be disassociated for all time; and his last words and thoughts were of unfinished works, the completion of which he himself still hoped to oversee.

Why is it that every graduate and undergraduate of University College and the University of Toronto has always identified the figure and personality of Sir Daniel Wilson with those institutions? Because he himself lived and had his being therein. If ever there lived a man whose work and surroundings were his life, this was the man. The rooms and corridors of the old College were his home; the hundreds of students who came and went—as

shadows to others, often—were his friends and associates; and their interests and their successes were his. Endeared as to him was every college association, every college memory, he in turn endeared himself to all who came in contact with him by the consciousness that, so long as he was there, of college life he was a part. His oft-repeated statement that he loved every stone in the College building was no exaggeration; and the mental and physical prostration which followed upon the calamitous fire two years ago was such as, to other minds, death of a dear one could alone have caused. It is a sad fact that the shock then caused, and the untiring efforts to repair the lost, have caused a death which, without such disturbances, need not yet have come. But what a gratification it must have been to know that even in so short a time zeal and activity had done so much to restore that in the building up of which so much time, enthusiasm and energy were spent, and in which was felt so deep a pride!

None can know the intense enthusiasm, the constant zeal, the untiring energy which so pre-eminently characterized Sir Daniel in all his duties as teacher and administrator, but those who have had association with him, or seen and felt his influence. Only those who have known him as President of College, as an active trustee of fluctuating funds, as a faithful Senator of his University, as an enthusiastic, erudite, and brilliant lecturer in subjects too many for any man to control, can in any degree appreciate his devotion to his work, and his singlemindedness in the performance of it.

But a professor's life is not all lived within the classroom and the College wall. Nor is the student's life confined to these. And this Sir Daniel knew; and in all that concerned the student's life he had an interest deep and constant. In sports he, himself an athlete, was always present; life in college residence—with its jars, and its fights, and its roughnesses, and its severe training for after life—was to him the greatest educationist; and many a prize-man has been told, on many a commencement day, that the reading of books, to the extent of weariness of the flesh, is not what a college is meant to encourage. And few of Sir Daniel's students of the past quarter of a century have not met him in his own home, where his gentlemanly courtesy, his shrewd humour, his love for art and literature, and his close familiarity with both, have made him at once a host, a preceptor, and a friend. As a friend, many a graduate will long continue to remember him with reason and in sincerity.

The honour of knighthood, richly deserved, added nothing to his dignity. A few days after the bestowal of that honour, the writer, in introducing Sir Daniel as chairman of a College meeting, introduced him as "Doctor," in rude forgetfulness omitting his newly-won title, and to an after explanation received the reply that he was only too glad to think that his old students remembered him, as he had been known for years, as plain "Doctor Wilson." This was eminently characteristic of the man—desirous always, not so much that the world should sound his praises in the streets, as that he should be known as one who was loved and remembered by those with whom and for whom he toiled.

WILLIAM CREELMAN.

FORCE AND ENERGY—II.

IN my former paper in THE WEEK I affirmed, according to Grant Allen's theory, that the powers which divided between them the empire of the universe are two—Force and Energy—but I confined my attention then principally to the question of Energy, which Grant Allen had defined as "separative power," and which, as such, prevents bodies from aggregating and initiates separative motions. In my present paper, however, I wish to draw attention chiefly to the other powers of nature, such as the force of gravitation, of cohesion, and of chemical and electrical affinity—force binding together, and energy separating, and, so, dividing the world between them. But on this latter, the rule of force, there have been, of late years especially, some doubts and, indeed, denials expressed by a particular school of physicists, and as the truth of Grant Allen's theory rests on this as on a sure foundation, I shall proceed to examine its grounds, for, as one very able opponent expresses it, if this—the force of gravitation, or the attraction of matter for matter—can be established, it would be very hard to prove Mr. Allen wrong in his great theory so closely and elaborately worked out. And, surely, how the kosmos is held together from falling to pieces on the one hand, and how it is kept in ceaseless activity on the other, ought to be to inquisitive thinking beings a question worthy of deep consideration. Now what we maintain in this paper is this, that gravitation is a real force—that every mote that dances in a sunbeam is bound by the same force as the mass of the earth. The energy of air currents may carry it upwards beyond the

range of visibility, yet is it tethered to the earth and the universe by omnipotent law, and can never be separated from the total of things, so as to travel capriciously through the void. The particles of iron in a cannon-ball are not more securely held in the adamant grip of force than is the most insignificant particle in remotest space. None wanders lawlessly of its own sweet will. For of nature it may be truly said, to it "no high, no low, no great, no small; it fills, it bounds, extends and equals all," and in the great vortex of things every particle is included—nothing is left outside. Matter being a *continuum*, nothing is separable, nothing alone, nothing unrelated. Every thing is bound to all things and all to every thing. In brief, the universe is one—immersed in the one ever present ether, bound by the same invisible ligaments of force.

It was on the basis of this law of universal gravitation, as laid down by the immortal Newton, that "every particle of matter in the universe attracts every other particle by a force directly as its mass and inversely as the square of its distance," that he performed the greatest feat ever conceived by the mind of man. Since his time (and he, too, stumbled here, as you will see in the sequel) for over two hundred years some of the subtlest and strongest thinkers in Europe have been beating their brains to get at the cause of gravitation, but always to be baffled, and to-day one of the ablest of them acknowledges that "the progress made towards the solution of this problem since the time of Newton has been almost imperceptible;" and again, the illustrious Clerk Maxwell, after detailing many hypotheses on the subject, adds, "we are forced to conclude that the explanation of the cause of gravitation is not to be found in any of these hypotheses;" and again, says he, "there is a great deal of dynamics here, but we can hardly say that there is even the beginning of a dynamical theory of the method by which bodies gravitate towards each other." But they gravitate towards each other because they are parts of each other—parts of a rounded whole bound each to each and to all—because impalpable threads of subtle elastic force arise on every side from all this wonderful protean, thaumaturgic matter of the universe, binding the one in the all and the all in one—an integer for ever—yet allowing full play to all the energies of the kosmos; for the universe is full, too, of the omnipresent energy of motion. And how is this never-ceasing motion to be accounted for? What is there behind it to cause it? Can we give any better account of it than this, that it is—that, like gravitation, it is a primal fact, that first facts are first facts, and that there is nothing before the first? Why not regard gravitation as one of the profoundest minds in Europe regards it, as "a property of universal matter"? And what loads of difficulty roll away from the subject by including force among the factors of the universe?

This, then, is the very core of the matter. For though some modern critics ridicule the very idea of such a thing as "the pull of gravity," yet such an able mathematician as Sir Robert Ball builds everything on "the magnitude of this pull, which is being exerted by the sun" on the earth, comparing it to a "rope" tethered to it, and avers that "every body in the whole universe attracts every other body." Helmholtz, too, standing as he does to-day in the very front rank as mathematician and physicist and great and sober thinker, when writing of the vast distances of the stars, says, "but, notwithstanding these enormous distances of the star-masses, there is an invisible tie between them which connects them together . . . this is the force of gravitation by which all heavy masses attract each other . . . the force which causes a body to fall to the ground is none other than that which continually compels the moon to accompany the earth in its path around the sun," and he adds, "you thus see in gravitation we have discovered a property common to all matter," and again says he, "this universal property of all matter is shared by the most distant celestial bodies." We see, then, how a man of vast knowledge, penetration and insight, working himself every day in the very laboratory of nature itself, and constantly associated with the ripest scientists of the world, is persuaded that the universe is one and is bound together by dynamic ties of force. Yet this is the very pith of the question in controversy, which, if conceded, the rest of the argument against Grant Allen's theory comes to very little indeed, and force and energy, as so lucidly explained by him, are the two kingdoms which divide between them the physical universe. And if this we see in every falling stone, and can test it as a fact every calmest hour, are we obliged to reject it because we are unable to see in the rear of it all a compelling cause? But if the universe is one whole, undivided and indivisible, from which no part can be separated, to which no portion is unrelated, but is, indeed, essential to it, and if gravity is, so, of the *esse* of things, are we to reject it because we can not see the *de esse* of it? But can we tell why fluorine rushes with such a violence of attraction into combination with almost any body in nature, hardly any vessel being able to hold it on account of the fierceness of the attractive force by which it seizes on the elements of almost all of them. Yet who can explain the why of this? All that we can say about it is this, that it belongs to the underlying nature of things that it is so. Of course, when a stone falls to the ground, or the tides rise towards the moon, or the moon keeps falling to the earth, the fall has a cause, but that cause lies hidden in the "vis gravitatis" of each attractive force. They all belong to the undivided whole, which feels to its centre every pulse-beat of every particle of