keep up intercourse with God, without both or one of these aids to foster it.'

To my bachelor friends, then, I would say, *marry*; you need home affections to make truer patriots, more useful citizens, and better, as well as happier men.

From Hogg's Edinburgh Instructor.

THE SUNBEAM'S EFFECT IN NATURE.

LIGHT.

The sunbeam, in its wonderful powers and almost magical influences, has only of late years received that amount of attention so justly its due; philosophers were too deeply absorbed in abstract speculations as to its nature to direct their inquiries to its share in the great operations of nature. Let us take a brief glance at some of the discoveries made by researchers, which form one of the glories of modern science. For this purpose, we shall arrest one of these subtle, swift-flying beams, on their bright course from our great luminary, having first allowed it to pass through a prism. In the spectrum or image thus formed, the light is divided into its three primitive colours—red, yellow, and blue; the other colours—orange, green, indigo, and violet—being formed by the mixture of these. The light is most intense in the yellow ray. Light does not by itself form the sunbeam; it is intimately associated with heat, which is strongest in and beyond the red rays, and actinism, which is most powerful in and beyond the violet ray. We shall speak in detail of each of these great powers, which are now universally admitted to reside in the sunbeam, not entering into the question whether they be in truth three separate principles, or only modifications of one and the same force. Some would add electricity as a fourth constituent; but that power would rather appear to result from the action of the three forces we have named.

Light is that part of the solar beams which adorns our world with all its beauties—which paints the lovely hues of the fair flower, tints the azure dome above us, and flings the glorious rainbow across it. The close dependence of colour on light must have been observed by all. Gather a flower grown in the depths of the forest, where the rays of the sun cannot freely penetrate, and another which has basked in the full sunshine, and mark the difference in their tints: the leaves and stem of the one a sickly green, its petals pale, almost colorous; the other deep and bright in all its hues. Again, contrast the vegetation of the tropics with that of our own country. Words cannot describe the magnificece of the colouring of the tropical vegetation. Scarlet, purple, orange, rose, and blue, mingle in very possible combination, rendered still more brilliant by the contrast of their dark green leaves. There gigantic size is no less remarkable than their gorgeous hues—the grasses being over forty, and the reeds a hundred feet high. Here the sky is not so bright, the light so dazzling, nor the soil so fertile, and, consequently, the colouring is subdued and chastened—a proof of the beautiful harmony which pervades all by the Divine hand, which our artists would do well to copy. The green colour of plants is due to the formation in their cells of a compound highly charged with carbon, called chlorophyll. This compound is produced under the influence of light. Plants grown in the dark are not green, but, on exposure to the light, chloropnyll is immediately formed, and they soon became so. Careful experiments have clearly proved that the light rays, as distinct from heat and actinism are the agents which produce this effect. A circumstance mentioned in the 'Gardeners' Chronicle' furnishes a proof, as well as illustration, of this fact: In a district in North America the sun, for a period of twenty days, had been obscured by dense clouds. During this time the leaves of the forest, growing quickly under the influence of heat and moisture, had attained their full size. The light which fell on them not being sufficiently powerful to produce chlorophyll, the strange spectacle was to be seen of a forest of pale, whitish trees. At length the clouds broke; the sun shone forth, and poured a flood of light on the pale leaves; chlorophyll was at once in process of formation, and the setting sun shone on a forest verdant and beautiful, as though it had been clothed in the full sunshine.

Upon the formation of chlorophyll under the influence of light depend consequences of the utmost moment to the animal world including man himself. Plants thus absorb the carbon which forms their woody structure, from the small proportion of carbonic acid gas contained in the atmosphere. Look at that majestic tree: it was the subtle imponderable ray of light which gave it its strength and firmness, and rendered it fit to form a part of our wooden walls. Closely connected with this, and equally dependent on light, is the power of plants to exhale pure oxygen. Carbonic acid gas, which is abundantly supplied by the respiration of animals, is the gas at all times breathed by plants; during the hours of darkness, much of it passes off unchanged, but no sooner does the first beam of the sun light up the eastern horizon, than their functions are quickened into activity, and all day long they pour forth pure streams of oxygen—thereby preserving the purity of the atmosphere, and maintaining it in the condition necessary for the support of animal life, while at the same time they retain the material which gives them vigour and stability.

Of no less importance is light to the life and organization of animals; it is essential to their existence. One animal, the Proteus anguinus, does indeed exist in the silent darkness of caverns, where the cheerful light of day can never penetrate; but this is the only known case where life exits out of the reach of light. Experiments have proved that all life, animal and vegetable, ceases in the sea at the depth of 300 fathoms, and shells found at a depth little less than this are completely colourless. As we rise to the surface, we gradually pass, from the first faint tint, a pale rose, through increasing fulness and variety of colouring to the gayest combinations of brilliant hues, which rival the flowers of the sunny south. Nor are the terrestrial animals less affected in their colours by light than the inhabitants of the waters. Compare the gorgeous robes of the birds of the tropics with the sombre dress of our own feathered songsters, whose delightful notes, however, fully compensate for their less brilliant appearance. Light also effects the development of animals. The distinguished naturalist, Dr. Edwards, placed some frog's spawn in a darkened vessel, at the same time placing similar spawn in a vessel which admitted the light. The vessel, in all other circumstances, were alike. The eggs exposed to the light were developed in the usual time; the others showed no sign of development. He then tried similar experiments with the tadpole: those kept in the light soon underwent their transformation into frogs, while those in the dark, though they increased in size, they preserved their form.

The immense effect which light has over the healthy organization of man himself has been sadly overlooked; yet a very little reflection will convince us of the fact. Compare the squalid, unhealthy child, born and reared in the dark narrow lanes of our cities, with the bright, robust, happy little ones, who cluster round the cottage in the country. In the dark caverns under the fortification of the town of Lille, which often were the dwellings of the poorest of the people, so many deformed infants were born, that the authorities forbade their being inhabited. Humbolt says, that never in all his wanderings through the savage tribe of North and South America has he met a single instance of deformity.

It has been known that a portion of the heat that falls on any body becomes latent; and, latterly it has been considered that light also becomes latent, or that many, if not all bodies, have the property of retaining within ther structure some portion of the light which impinges upon them, and again emitting it. Several flowers exhibit this phenomenon. The nasturtium, if gathered in the full sunshine, and then taken into a dark room, will, after the eye has become rested, be clearly seen by the light it emits. Geothe observed, after a day of unusual brightness, that a flickering flame played round the blossoms of the sun-flower during the shades of twilight. The human hand, if kept in the sunlight for a moderate length of time, will emit light in the dark. The earth itself possesses, as proved by Humboldt, a faint luminosity independently of that which it receives from the sun, and which enables us to direct our steps in the open air in those dark nights of winter, when neither moon nor stars appear. It is thought that this arises from its emitting the light it has absorbed during the day. This may also account for the self-luminous jewels which have so long puzzled philosophers, and is a subject full of interest.

Erom Cnanbers's Edinburgh Journal.

THE LETTER FROM HOME.

BY THE REV. JAMES GILBORNE LYONS, L.L.D.

A Youthful stranger walk'd alone
In a great city's busiest place;
He heard not one familiar tone,
He saw not one familiar face:
He trod that long and weary street
Till day's last beam wax'd faint and dim,
But none were nigh to cheer or greet—
Not one was there to smile on him.

He saw before him thickly press
The rude, the beautiful, the proud,
And felt that strange deep loneliness
Which chills us in the selfish crowd:
Ay! though his heart was stern and strong,
And scorn'd each soft and wailing mood,
He felt a sore and saddening throng
Of doubts and wasting cares intrude.

While yet he mused in bitter thought,
A messenger appear'd at hand,
Who to that mourning pilgrim brought
A letter from his own fair land:
Eager as if it searched a mine,
His eye the welcome page explor'd
And, as he read each glowing line,
Hope, gladness, life, were all restor'd.

Yet mightier than the voice from home,
Which nerv'd the drooping exile's breast,
Those words of Thine, Redeemer! come
To calm our fears and give us rest.
When, in some sad and sunless hour,
We pine for smiles and tones of love,
They bid us look, through storm and shower,
To Thee our Light and Life above.

WATERING PLACE IN NEW ZEALAND.

On our way we visited Wakarewarewa, Hot springs, by far the finest at Rotorua, about seven miles from Mr Chapman's and about three from Ohinemuta. Here are to be been all the varieties of Ngawha (hot springs) They are mud cauldrons, black, blue, grey, green, yellow, and red, the very emblem of laziness; a faint stream rises from them, and ever and anon a solitary bubble of gas disengages itself slowly from the surface, which then returns to its usual dullness. Close by the side of these, and in strong contrast, are the clear pools of boiling water, of great depth, and of bright azure, enclosed in precipitous walls of sulphureous formation; from some of these, hot streams flow down, which are guided by the natives either into artificial baths or into natural hollows of the rock; the supply of hot water being so regulated as to keep the bath at the right temperature. Among these cauldrons and pools, a strong and rapid stream of cold water rushes down, in some places not a yard from the spot at which the natives are sitting up to their breasts in hot water, shelling Tawa berries, or peeling potatoes or, failing in these employments, enjoying their never-failing resources of smoking. But by far the most beautiful springs are the boiling jets, which are thrown up to the height of many feet from a narrow orifice in the top of an irregular cone, formed of the matter held in solution by the water, which is deposited as it cools, and forms a substance of a pinkish white colour, sometimes also tinged with yellow by crystal of sulphur. It is perfectly safe to stand upon the tops of these cones, to the windward of the spout; and from that position it is grand, first, to hear the roaring and boiling of the cauldron, and then see the jet spring up into the air, shivered by the force of its projection into silvery foam, and accompanied by a volume of white steam. The hot water, in its descent, trickles down the sides of the crater, and falls into several natural baths of most agreeable temperature formed into the pure and white substance of the cone, and lined with the same matter in its half formed state, still yielding and elastic. Here the traveller may lie at his ease, and watch the bursting of the boiling fountain above him; but, if the wind should happen to change, he must shift his position, or his place will soon be too hot for him. A small native village is here, with the usual appurtenances of a native steam kitchen at the Hot springs—namely, hot plates, made of large slabs of stone, laid over boiling water to dry the Tawa berry upon, steam hanghis, or native ovens, always in readiness, and holes of boiling water, in which fish and potatoes can be speedily cooked. A native swing completes the equipment of this fashionable watering place, which, together with the game of drafts, relieve the *ennui* of those who resort to the baths.—*Bishop Selwyn.*

MORAL SYMETRY.

Symmetry is the appropriate adaptation of the parts; and moral symmetry is the harmonious combination of the various graces and virtues to each other. In the human body, if any of the members are unduly large, the proportion and symmetry are destroyed; and however important that any member may be, its want of conformity to the other members makes it a blemish to the whole. Now the various principles of divine truth should have their due and proper influence on the mind, producing moral symmetry in the new man. Hence a Christian is not to be all head or knowledge; or all month or utterance; or all heart or emotion; or all bowels or sympathy; or all feet or activity; or all shoulders or endurance; but all these must be exhibited in their due and appropriate proportions and beautiful symmetry. How numerous are the instances of moral deformity, which are constantly passing before us! The religion of one, is precision in the reception and retention of truth. Of another, rigid and scrupulous exactness of conduct. Of a third, an ardent and bold profession. Of a fourth, an unwavering reference to joys and comforts experienced. Of a fifth, a glowing, benevolent activity. Of a sixth, a fervent devotion. And of a seventh, a constant glorying in the cross of the Lord Jesus. The religion of the New Testament in the whole of these, displayed in their mutual connexions and harmony with each other. Knowledge, however profound, cannot dispense with faith; or faith, however vigorous, with love; or love, however ardent, with obedience; or obedience, however cheerful, with patience; or patience, however elastic with prayer; or prayer, however instant, with praise; or praise, however exalted, with humility; or the whole, with an entire recumbency of the soul on the Lord Jesus Christ, as 'the way, the truth, and the life.'—*Dr. Burns.*

New Works.

From Lord Mahon's History of the American Revolution.

FRANKLIN.

Dr. Benjamin Franklin is one of those men who have made the task of succeeding biographers more difficult by having been in part their own. He was born at Boston in 1706, the youngest of ten sons. 'My father,' he says, 'intended to devote me, as the tithe of his sons, to the church;' but on further reflection, the charges of a college education were thought too burthensome, and young Benjamin became a journeyman printer. From a very early age he showed a passionate fondness for reading, and much ingenuity in argument, but, as he acknowledges, had at first contracted a disputatious and wrangling turn of conversation. 'I have since observed,' he says 'that persons of good sense seldom fall into it, except Lawyers, University men, and generally men of all sorts who have been bred at Edinburgh.'

Young Franklin was at first bound apprentice to one of his elder brothers, a printer at Boston; but some differencee arising between them, he proceeded to Philadelphia, where he soon obtained employment, and ere long set up for himself. His success in life was secured by his great frugality, industry and shrewdness. In his own words: 'I spent no time in taverns, games, or frolics of any kind; reading was the only amusement I allowed myself.' His knowledge and shrewdness—great zeal in urging any improvements, and great ingenuity in promoting them—speedily raised him high in the estimation of his fellow townsmen, and enabled him to take a forward part in all the affairs of his province. In England and indeed all Europe, he became celebrated by his experiments and discoveries in electricity. These may deserve the greatest credit when we recollect both their practical utility and their unassisted progress—how much the pointed rods which he introduced, have tended to avert the danger of lightning, and how far removed was Franklin at the time from all scientific society, libraries or patronage.

It has also been stated by no less an authority in science than Sir Humphrey Davy, that 'the style and manner of Franklin's publication on Electricity are almost as worthy of admiration as the doctrine it contains.' The same remark may indeed be applied to all his writings. All of them are justly celebrated for their clear, plain, and lively style, free from every appearance of art, but in fact, carefully pointed and nicely poised. In public speaking on the other hand, he was much less eminent. His last American biographer observes of him, that he never even pretended to the accomplishment of an orator or debater. He seldom spoke in a deliberative assembly, except for some special object, and then only for a few minutes at a time.

As a slight instance of Franklin's humor and shrewdness in all affairs of common life, I may quote the following: 'Question. I am about courting a girl I had but little acquaintance with. How shall I come to a knowledge of her faults? Answer. Commend her among her female acquaintances!'

Whether in science and study, or in politics and action, the great aim of Franklin's mind was ever practical utility. Here again we may quote Sir Humphrey Davy as saying of Franklin that he sought rather to make philosophy a useful inmate and servant in the common habitations of man, than to preserve her merely as an object of admiration in temples and palaces. Thus, also, in affairs he had a keen eye to his own interest, but likewise a benevolent concern for the public good. Nor was he ever indifferent to cases of individual grievance or hardship. In the pursuit of his objects public or private, he was, beyond most other men, calm, sagacious, and wary; neither above business nor yet below it; never turned aside from it by flights of fancy nor yet by bursts of passion.

Among the good qualities which we may with just cause ascribe to Franklin we cannot number any firm reliance on the truths af Revelatiou. Only five weeks before his death we find him express a cold approbation of the 'system of morals' bequeathed to us by 'Jesus of Nazareth.' In his Memoirs he declares that he always believed in the existence of a Deity and a future state of rewards and punishments, but he adds that although he continued to adhere to his first—the Presbyterian—sect, some of its dogmas appeared to him unintelligible, and others doubtful. 'I early absented myself from the public assemblies of the sect; and I seldom attended any public worship; Sunday being my studying day.'

Such being Franklin's own practice, and such being his own description of it as to public worship, it seems worthy of note that it was he who in the American Convention brought forward a motion for daily prayers. 'I have lived, Sir,' said he, 'a long time, and the longer I live the more convincing proofs I see of this truth, that God governs in the affairs of men. And if a sparrow cannot fall to the ground without his notice, is it probable that an empire can rise without his aid?' But in spite of this most earnest appeal the motion was rejected, since, as we are told, 'the convention, except three or four persons, thought prayers unnecessary.'

The accomplished American biographer, by whom the last incident is recorded, expresses in the same passage deep regret that Dr. Franklin did not bestow more attention than he seemed to have done on the evidence of Christianity. And indeed there are several indications that he was less well acquainted with points of Christian faith and discipline than almost any other subject. One of these indications, and surely a most strange one, occurs in the Private Diary which he kept at Passy during 1784. It appears that two young American gentlemen had come over to London with the view of entering Holy Orders, but that the Archbishop of Canterbury refused them Ordination unless they would take the Oath of Allegiance. In this dilemma Franklin actually applied to the Pope's Nuncio at Paris to ascertain whether a Roman Catholic Bishop in America might not perform the ceremony for them as Protestants, and he transcribes as remarkable the natural reply: 'The Nuncio says the thing is impossible unless the gentlemen become Roman Catholics.'

The religious scepticism or indifference of Franklin, which his present biographers justly lament, was, however, in his own day, a recommendation and a merit with the French philosophists. On the other hand his hostility to Englaud endeared him to the French politicians. On both these grounds,