

Teachers' Department.

Sabbath School Scripture Lessons.

OCTOBER 17th, 1858.

Subject.—TO KNOW GOD ARIGHT IS TO KEEP HIS COMMANDMENTS.

For Repeating. For Reading. 1 John i. 8-10. 1 John ii. 1-11.

OCTOBER 24th, 1858.

Subject.—THE LOVE OF THE WORLD INCONSISTENT WITH THE ENJOYMENT OF GOD'S FAVOUR.

For Repeating. For Reading. 1 John ii. 1-3. 1 John ii. 12-19.

THE QUESTIONER.

Bible Questions.

34.—In what respects were Adam, Melchisedec and Moses types of Christ? Give the texts to prove your answers.

35.—What was the first indication of Christ's kingly character after his birth?

Solution to Mental Picture from the Bible No. 70. Hagar and her son Ishmael.—GEN. xxi. 15-19.

Providence in the Atlantic Telegraph.

REVELATIONS OF SCIENCE.

PALEY, in one of the most pregnant and suggestive chapters of his "Natural Theology," remarks upon "the uniformity of plan observable throughout the universe," saying, that "we never get amongst such original or totally different modes of existence as to indicate that we are come into the province of a different will. In truth, the same order of things attends us wherever we go." What is here said of space is equally true of time, and proves not only the unity but the eternity of God. However far back we go in the lapse of ages, we find the same great principles at work, the same grand ends kept in view, the remotest and the immediate present bound together by unity of design. Science is constantly discovering some new proof of the providence of God, preparing, in ages long past a supply for wants for to-day. He has laid up in store, at a period so distant as to seem like eternity, the materials which our advancing civilization and science now for the first time require and learn how to use, and which have been previously neglected or unknown. This indeed is the true meaning of the word providence, the etymological import of which is to look forward, to anticipate, and so to make provisions beforehand for some coming want. The following passage from a recent work of geology will illustrate our meaning, and show how in past ages the providence of God has been displayed, not only in supplying "but in anticipating and providing for those of creatures who were not to come into existence till long ages had rolled away:—

PROVIDENCE LEARNT BY GEOLOGY.

"If a created and intelligent being from some other sphere had alighted on this globe during that remote period when the vegetation now dug out of the coal formation covered the surface with its gigantic growth, he might have felt as if there was a waste of creative power. Vast forests of sigillaria, conifera, cycadea, and tree ferns would have waved over his head, with their imposing though sombre foliage, while the lesser tribes of calamites and equisetacea would have filled the intervening spaces; but no vertebral animal would have been there to enjoy and enliven the almost universal solitude. Why, then, he must have inquired, is there such a profusion of vegetable forms, and such a colossal development of individual plants? To what use can such vast forests be applied? But let ages roll by, and that same being revisit our world at the present time. Let him traverse the little island of Britain, and see there fifteen thousand steam-engines moved by coal dug out of the earth, and produced by these same ancient forests. Let him see these engines performing the work of two millions of men, and moving machinery which accomplishes what would require the unaided labours of three or four hundred millions of men; and he could not doubt but such a result was one of the objects of that rank vegetation which covered the earth ere it was fit for the residence of such natures as now dwell upon it. Let him go to the coal-fields of other countries, and especially those of the United States, stretching over one hundred and fifty thousand square miles, containing a quantity absolutely inexhaustible, and already imparting comfort to millions of the inhabitants, and giving life and energy to every variety of manufacture through the almost entire length of this country, and destined to pour out their wealth through all coming time, long after the forests shall all have been levelled; and irresistible must be the conviction upon his mind that here is a beautiful example of prospective benevolence on the part of the Deity. In those remote ages, while yet the earth was unfitted for the higher races of animals that now dwell upon it, it was eminently adapted to nourish that gigantic flora which would produce the future fuel of the human race, when that crown of all God's works should be placed upon the earth. Ere that time, those forests must sink beneath deposits of rock thousands of feet thick.

But during all that period, all those chemical changes which are essential to convert them into coal would be accomplished, and, at last, man would find access, by his ingenuity and industry, to the deep-seated beds whence his fuel might be drawn. Nor would these vast repositories fail him till the consummation of all things. Surely there was no waste, but there was a far-reaching plan of benevolence in the profusion of vegetable life in the earlier periods of our planet."

But geology is not the only science which affords illustrations of the prospective benevolence of Deity. Into whatever realm of nature we turn our eyes we find the same great fact presented to us. Creation, throughout all time, as well as throughout all space, testifies to the unity of the Deity, and seems to exclaim, "From everlasting to everlasting Thou art God." The successful laying of the Atlantic Telegraph—that crowning achievement of modern science affords many new and striking illustrations of this truth, to some of which we propose to advert.

OPINIONS OF THE ANCIENTS WITH REGARD TO ELECTRICITY.

First, as to the agency employed. For long ages the thunderbolt and the lightning flash were the only manifestation of electricity known to man. All nations quailed and trembled before the destructive action of this widely-diffused power, and regarded it as the terrible minister of the vengeance of the gods. Every mythology in the world has armed its chief deity with these weapons. Alike to Zeus and Jupiter and Thor the thunderbolt formed the dread artillery which they turned against their enemies. Greek and Roman and Teuton worshipped the thunder-wielder as his supreme God. When Christianity had unpeopled Olympus and Asgard, and given correcter views both of nature and of God, the existence of this devastating power remained as a difficulty to be solved by theologians. Why, it was asked, has the Deity called into existence an element whose sole agency is to destroy? To such a question an inadequate answer could be given, and the believer had to fall back upon the general evidences of a merciful order and a divine benignity throughout universal nature, which was only broken in upon, not destroyed, by these exceptional disturbances. By degrees, however, it was discovered that the thunderstorm was only the rare and abnormal disturbance of a force which is diffused through nature, animating, fertilizing, and impelling the whole; that silently yet constantly is at work as a latent vitalizing force throughout creation. Though it may sometimes speak in thunder or flash forth in lightning, it is always acting in the growth of every flower and in every dew drop that glistens upon its leaves. It is the secret power which

"Warms in the sun, refreshes in the breeze, Shines in the stars, and blossoms in the trees."

MODERN ELECTRICAL SCIENCE.

Our object, however, is not to trace the general action of this agent in nature, but to call attention to the fact, that many of its properties are now for the first time discovered and turned to the service of man. That mysterious power which for thousands of years has been present with man, and which may perhaps form the connecting link between body and soul, which has pervaded the earth and sky, which was latent in every cloud, and came down with "the small rain upon the mown grass," this most subtle element man has seized and bound and made his messenger. "Nimble Ariel" could not fly so swiftly at Prospero's bidding as does this elemental power, which in one mode of its manifestation can shatter the Pyramids, or rive and "rend in pieces the mountains," but which when subdued by man can flash his thoughts from pole to pole with a velocity which sets time and space at naught. Already electricity is rendering immense service to mankind. Almost every department of science and of the arts have pressed it into their service. When a few years more have elapsed it will have united the most distant regions of the earth. Communications between India and America will be as speedy and easy as between next-door neighbours. A century hence our descendants will wonder how the business of the world went on without electricity, just as we wonder how our forefathers managed without steam-power. Six thousand years ago, He, "known to whom are all his works from the foundation of the world," foresaw that his creatures would hereafter discover the value of this mighty agency, and therefore laid it up among his treasures against the time when we should be able to avail ourselves of his providential care.

It is about twenty-four years since the idea of the Electric Telegraph as an instrument of practical utility occurred to the mind of Professor Wheatstone, and about three years later the telegraphic line was exhibited in action; but it was not till the year 1842 that the transmission of electricity through water was attempted. The

difficulties in the way of a submarine telegraph may be readily explained. Atmospheric air being a non-conductor, the electric fluid passes along the wires without being drawn off in its transit. As the wires are insulated by glass or stoneware at the points where they rest upon the poles, it is prevented passing along them downward to the earth, and thus it flashes from end to end of the telegraph line without escaping. But in carrying the wires beneath the ocean neither of these conditions exist. The wires resting upon the ocean-floor must be in contact with the earth, and being moreover surrounded by water, which is a conductor of electricity, the subtle fluid would be drawn off at every point. It is therefore necessary to case the wires in some non-conducting substance along their whole length, and thus insulate them throughout. But no substance was known which possessed the necessary qualifications. To glaze them would be too costly a process; besides which, all vitreous substances are exceedingly brittle, and cannot be coiled or curved. It would, therefore, be impossible to lay a cable insulated by any such means.

GUTTA PERCHA.

A substance was needed which should be elastic, flexible, capable of being easily fused and hardening again so as to form a coating of the wire, it must be sufficiently tough to bear abrasion at the bottom of the sea, it must be available in large quantities at a moderate price, and it must be a non-conductor of electricity. No substance was known to exist containing these various properties; yet without it a submarine telegraph was impossible. In the very year in which Professor Morse sat himself to experiment upon the transmission of electric currents through water, Dr. Montgomerie, one of the medical staff of the East India Company, was walking in the woods near Singapore when he observed a parang in the hands of a Malay, the handle of which was made of a material he had never seen before. He asked the man what it was; the inquiry resulted in the discovery of Gutta Percha. In this vegetable exudation are combined all the properties needful for the completion of a submarine telegraph. In addition to its other uses, previously unknown, was this—that it rendered the transmission of messages from land to land along the ocean floor practicable. In the rank jungles of Malacca forests a natural product had lain concealed for 6,000 years, which was destined to give a new impulse to civilization by bringing the most distant nations within hail as it were, and rendering instantaneous communications between them possible. When God surveyed his works and pronounced them all "very good," this product was among them. Sixty centuries must elapse before its utility would be discovered, or the need of it felt, or its very existence suspected. But with him "a thousand years are as one day." His providence anticipates the want ages before it is felt; his prospective benevolence lays up in store the supply which lies unknown, waiting discovery, to be forthcoming as soon as wanted.

THE SUBMARINE TELEGRAPH PLATEAU.

There was another difficulty to be met, another problem to be solved, before the Telegraphic Cable could be laid along the bed of the Atlantic and a junction of the Old and New Worlds effected. The ocean was known to be in many places of an enormous depth. The soundings showed a bottom of nine miles below the summit of the Andes, and more than four miles below the level of the sea. Careful examination with ingeniously-contrived apparatus for sounding made it clear that huge mountain summits, with their pointed peaks and sharp, craggy sides, rise to the height of many thousand feet from the bottom of the Atlantic, flanked by precipices, which plunge down to a corresponding depth.

"Sharp peaks and crested ridges, with precipitous sides, reproduce all the bold Alpine contours which are encountered upon the land. Supposing it to be required that a submarine telegraph cable should be stretched directly from Ireland to the United States, that cable would have to be lodged upon such supports. In some places it would have to hang upon lofty pointed peaks, in others it would be bent up and down in zig-zag depths, and in others it would depend from precipitous walls thousands of feet high. The idea had occurred that it might be a very convenient course to make a telegraphic communication between the British Islands and the United States through the Azores, but unfortunately it happens that this cluster of islands is composed of rugged and precipitous masses, which are pierced up from the depths of the ocean so suddenly that not a single scrap of shoal coast, nor a single sheltered bay, is to be found anywhere among them. The Azores are also in the very midst of an area of volcanic disturbance. In their neighbourhood the bottom of the ocean is liable at any moment to be heaved up and to be crushed and broken. . . . When Lieutenant Maury was consulted by the House of Representatives touching the practicability of either of these routes, his answer was, 'These peculiarities of

the course constitute obstructions which, in the present state of our knowledge, are fatal to such a route.'

Here, however, a very remarkable provision comes to light. A broad level plateau stretches across the ocean from the coast of Ireland to that of Newfoundland, so admirably adapted to be the pathway of the telegraph that Lieutenant Maury, through whose exertions it was discovered and defined, prophetically christened it the Telegraph Plateau long before the company was formed to carry the project into execution. The history of this submarine highway is remarkable. It is entirely composed of minute microscopic shells, which to the naked eye appear like very small grains of sand, but a strong magnifying power shows that there is not a grain of sand in the whole mass. Countless millions of tiny creatures have lived and died to make up each foot of this oceanic path, which is in round numbers two thousand miles long, four hundred miles wide, and on an average two miles in thickness. But whence come these infinite myriads of microscopic animalculæ? Their shells, fine as the most delicate film, show no traces of abrasion; they are perfect and unbroken. Besides which it seems clear that at a depth of two miles there is no life. And yet further the shells are tropical in their character. It is in the tropical seas then that we must seek the origin of the plateau.

Any good map of physical geography or treatise on the subject will show the course of the gulf stream, entering the Gulf of Mexico, flowing past the coast of North America, bending eastward as it reaches the banks of Newfoundland, and sweeping across the Atlantic toward the coast of Ireland, where its force being expended it divides, and is ultimately swallowed up in the great world of waters. There can be little doubt that it is in the Gulf of Mexico that these minute creatures have their original habitat. The gulf stream bears them northward in their current.

"If art had prepared a bed for the oceanic cable after full deliberation, it could not have devised any more complete arrangements than this profound recess of still water, paved beneath with smooth impalpable powder. It also appears that it is the nature of this dead little monad to agglutinate themselves round masses buried in their lawyers, and many excellent authorities believe that a telegraphic cable deposited in this submarine burial ground of the diatoms, would not only be in a tranquil and undisturbed retreat, but that after a few years it would actually be built in there by a stony pavement which no trifling exertion could manage to penetrate. There is no need then for much deliberation on the part of man as to the exact position the Atlantic Telegraph is to take. Nature has beneficently decided this question for him."

CONCLUSION.

It is we think impossible to resist the conclusion which the projectors of this great enterprise thus clearly state. When the directors of a great commercial undertaking point out the action of Providence in human affairs, it would be unseemly for Christians not to take account of it, May God, whose providential goodness we have traced, grant it may be for his glory and for the welfare of mankind; so that the Telegraph's first message may be fulfilled—GLORY TO GOD IN THE HIGHEST; ON EARTH PEACE, GOOD WILL TOWARDS MEN!"

LIFE'S TROUBLES.—We may compare the troubles which we have to undergo in the course of this life to a great bundle of faggot, far too large for us to lift. But God does not require us to carry the whole at once; he mercifully unties the bundle, and gives us one-stick, which we are to carry to-day, and then another which we are to carry to-morrow, and so on. This we might easily manage if we would only take the burden appointed for each day; but we choose to increase our troubles by carrying yesterday's stick over again to-day, and adding to-morrow's burden to our load before we are required to bear it.

We wish that our very ingenious friend who invented what was called the "paying out machines," for the Niagara and Agamemnon, would get up a little machine of the sort to be used in the case of every newspaper subscriber.—Louisville Jour.

A work of Martin Luther, never before translated into English, has just appeared in London. It is called—"The Creation: A commentary on the first five chapters of the book of Genesis."

Little Herbert—only four years old—was rather sharp and original, when he inquired of the hairy young man stopping at his father's, "Why do you have eyebrows all around your mouth?"

CLEAR TITLE.—A New Zealand chief maintained that he had a good title to his land because he had eaten the former owner.

Half an ounce of alum in powder, will purify twelve gallons of corrupted water.