

To-day and To-morrow.

'Tis weary watching, wave by wave,
And yet the life heaves onward;

The Transit of Venus in 1874.

The year 1874 will be a very notable year in the history of science, for in it, on the 9th of December, will occur the phenomenon known to astronomers as the transit of Venus.

The phenomenon alluded to is the passage of the planet Venus between the earth and the sun, in such a position with regard to the earth's orbit, that Venus is seen to move like a round black spot over the sun's face.

The first occasion on which a transit of Venus was observed for this purpose was in 1761, the eminent astronomer, Dr. Halley, having recommended a method, and devised a plan of observation to be used after his death, as he knew he could not live until the occasion arose.

The observations of 1769 have formed the basis of nearly all the accepted facts of modern astronomy, so far as the computation of distance, &c., is concerned. On these data it is that we have all learned from our earliest years that the sun is distant from the earth more than ninety millions of miles; that Mercury, the planet nearest to the sun, is 36,800,000 miles away from it; that the distance of Venus from the sun is more than 68,000,000 miles and so on.

The discovery of such errors, under the severe processes by which modern research is conducted, has led to increased anxiety on the part of the scientific world to secure the most perfect accuracy in every detail connected with the next transit. It will therefore be watched with the greatest care by astronomers all over the globe; their observations will afterwards be compared, and the results finally given to the world will, it is hoped, satisfactorily settle the questions involved.

The transit of 1874 will be visible in the British Isles, as it will take place in the early morning hours of English time, between half-past one and half-past six. It will be seen at Alexandria, in Northern India, in Australia and New Zealand, the Mauritius, &c., and at all these points, as well as others, England will have experienced observers. An expedition will also be sent by the Government to the Antarctic seas, and other nations will have their observing parties at different stations, apart from the fundamental necessity that observations should be taken at parts of the earth as widely distant as possible, is that the state of the weather and condition of the atmosphere at some of the places may not allow a clear view of the planet over the sun's disc; and therefore, if observation should altogether fail at some points, it will undoubtedly be successful at others.

The transit of 1862 will be visible in the British Isles. It will take place on the 5th of December when the entrance of Venus on the sun's disc will be observable, and her progress may be watched until sunset; but the egress of the planet will not occur until some hours after the sun has disappeared from those regions. As has been previously mentioned, no other transit can occur until June 2004, so that persons alive in England in 1874 will have the opportunity of observing a phenomenon which will not present itself again for two or three generations.

To fully explain to our readers the phenomenon of the transit, and the calculations depending upon it, would require a treatise, and the frequent use of mathematical terms; but an idea of the subject may be gained very easily. Every one knows that if you look at any near object from a certain standpoint, and then change your

placed, or in another position relatively to what you occupy. The nearer the object may be, the greater the displacement; and the further it is, the less the effect of your own removal. This palpable rule forms an elementary principle of all surveying, and the distance of an object is determined by taking the angles relatively to the base line, or straight line described between one point and another to which the observer removes. Now, if this principle be applied to the calculations of distance of the heavenly bodies, it will be found that a very long base line indeed must be taken before there is any apparent displacement in position (called by astronomers parallax) of even the nearest, which is our own satellite, the moon. The longest base line which it would be possible to command is that afforded by the diameter of the globe on which we live, namely in round numbers, 7900 miles. But so insignificant is this distance compared with that of the sun, that two observers stationed at opposite sides of the earth, the sun's centre would appear to both in the same point of the heavens. There is found no apparent displacement or parallax from the most widely extended observations. But when it happens that Venus in her orbit comes directly between the earth and the sun, as her distance from us is considerably less than the sun's, it follows that observers stationed at opposite sides of the earth will see Venus on different points of the sun's disc.

The points of chief importance in making observations in the transit are the moments of ingress and egress of the planet—that is, when its black shade first appears in contact with the luminary; again when the whole of the dark surface is fully projected; and lastly when the planet reaches the sun's opposite margin, begins to disappear, and finally vanishes. All these points, noted and timed by different observers all over the globe as far as practicable, and afterwards compared one with the other, give the data for a perfect record of the transit, and for the important results already mentioned.—Cassell's Illustrated Almanack.

At a meeting of the Astronomical Society, held on the 14th November last—Professor Cayley, F.R.S., in the chair—Sir George Riddell, the Astronomer-Royal, stated that five stations had been selected for the important observations on the ingress and egress of the planet Venus upon the sun's limb in 1874.

In accordance with the suggestions of Mr. De la Rue, and Mr. Proctor, a photographic observation would be made in Northern India, for which purpose necessary instruments had been sent out. Regarding Marquesas Island, he had some years ago made representations to the French Government. The war with Germany had interrupted the correspondence on the subject, but he still hoped for a revival. In the Sandwich group he had proposed to add two subsidiary stations. The chain of the Kerguelen extended over some fifty or sixty miles. There was a landing-place discovered by Captain Cook, called Christmas Harbour, which would probably answer well. The United States Government would probably take a station to the southeast of this, near Whisky Bay, on Herd's Island. He pointed out on an Admiralty chart the intended course of Her Majesty's ship Challenger, observing that on leaving Babir she had to go to the Kerguelen Islands, in order to obtain information. If this information should fail to reach here before the setting out of the expedition, it would be picked up at the Cape of Good Hope. But the determination of the most promising stations was not the only question at issue. The parts best accessible; and, besides, this, the consideration how the visitors were to live there was of no little importance. He and his colleagues were determined not to have a station devoid of anchorage or human inhabitants. As far as our present knowledge went, there was the one at Kerguelen, but not the others; while at Rodrigues the case was reversed. Nobody thought of going to Crozet Island or anywhere else where a boat was only to get ashore about once a month. Besides the British Stations, the United States would probably establish eight, France five, and Germany four. Regarding the staff of the expeditions, they were not quite so well prepared. If the Duke of Cambridge relaxed his orders, volunteers from the military service might come to join. At present the students of the Naval College and some private individuals, among them Father Perry, were main resource. The volunteers were now undergoing a complicated drill at Greenwich Observatory; for it was necessary that every one should have some knowledge of all that had to be done. The determination of longitude might in an emergency be postponed, but local time would have to be accurately established at every station. A transit instrument would be required at every place, and if any member possessed a portable one, its loan would be exceedingly welcome. Six equatorials were ready: the Cambridge University had lent two, and Mr. De la Rue one telescope; but all these were subsidiary matters to the critical observations which had to be performed. He had constructed a model which he would be glad to show to any member at Greenwich before two o'clock in the morning. The Astronomer-Royal then explained the use of the double-image micrometer, after which no one would probably think of again proposing the use of the ordinary worm-micrometer. The photograph would give a four inch picture of the sun; the diameter of Venus would be about one-thirteenth of that. He then explained Janssen's method of photographing by means of a rotating plate, not the entire, but only that portion of the disc where Venus would happen to be. He believed that by using dry collodion instead of the wet process, a number of hands might be saved.

Lord Lindsay held, with the Astronomer-Royal, that the dry process would be advantageous. The other would expose a man to noxious vapour during four hours. That we may not complain of the present, let us view God's hand in all events, and that we may not be afraid of the future, let us view all events in God's hand.—Oxford.

The Taxation of Church Property.

The taxation of church property has recently become a topic of public discussion, and promises to be more than of passing interest and importance. We do not approach it with any decided opinions, and we hope that the public will not do so, for there are two sides to the question, and the advocates of taxation are armed with specious if not strong arguments. Those who are interested in church property, knowing how hard it is to collect and embody it, and how severe the tax already is for the support of the institutions which it represents, will naturally protest that any new taxation would be intolerable. They regard the church, in its various fields and denominations, as a great, benevolent institution—a voluntary gift to the country and the world for the country's and world's good. It is not a business enterprise; it is not a productive industry; it procures no material return. In short, the money paid into the church is money forever parted with, and, as it goes into charity, ought not to be taxed. Indeed, taxation would be regarded as a new obstacle to the spread of Christianity, which could not be imposed save through an un-Christian or anti-Christian motive. The church is regarded not only as a religious institution, but as a great public school of morals, which ought not to be taxed any more than the public schools for educational purposes are taxed. Indeed, it is taken for granted that the State is under a certain degree of indebtedness to the church for voluntarily undertaking a task beyond the province of the State.

That there is something worthy of consideration in this view of the case is not to be questioned, but the advocates of taxation, speaking on behalf of the State, have a case also. We cannot better show this than by giving an extreme illustration. It is said, for instance, that there are in Rome three hundred and sixty-five churches, or one for every day in the year. The enormous piles of church architecture, the gold and jewels, the wonderful treasures of art contained in the churches and religious houses of Rome, have absolutely absorbed the wealth of the State. To suppose that pure and undefiled religion has sequestered all this property, simply for the good of the State, is to suppose an absurdity. Religion has had something to do with it, but superstitious fear has played its part. Many a man who has lived an ungodly life has sought to purchase peace for his soul by death-bed bequests to the church. Those bequests have been made, not because the church needed them, but because the givers supposed they needed to make them. Nobody supposes that Rome needs all the churches she possesses, and, in her case, at least, the State has the right to feel that it has been cheated out of its taxable property. The people are poor. They are ground into the earth almost by taxation, while the church is rich. A million dollars taken from the taxable property of the State and put into a church, or a number of churches, increases the taxation of every dollar left remaining. This is what the destruction of monasteries and nunneries at various crises of European history has meant. Church property has called for, and insisted on, the protection of the State, while not lifting the burdens of the State by one of its fingers. There have been brotherhoods of beggars, in the name of religion, who ceased to be producers, and self-supporters, and defenders of the State. What wonder that the State has occasionally scattered them? The State must live, and when a church absolutely sucks into itself all its sources of revenue, what is left but taxation or destruction?

The Protestant mind can comprehend this. It can also look on and see the Catholics in this country piling up cathedrals, buying land for an advance, and thus taking it out of the reach of taxation, and absorbing capital by the million with steadily advancing accretions, and see that something is going on here very much like what has been going on in Europe for centuries, with disastrous results to State interests. It can see this, and can wish that something could be done to prevent it; but it cannot see that taxation ought to be applied to Protestant church property.

Let us, then, suppose a case. Suppose that those who have the care of the State, or those who have a lively and intelligent interest in State affairs, see that, in most of the towns of the United States, there are two church sittings provided for every one there is occupied, and that half of the property set aside to church use, and thus removed from taxation, is really devoted to the advancement of sectarian interests; that if many of the feeble church organizations were killed it would be better for the community, and better for the real interests of Christianity, while it would considerably increase the taxable property of the State; that millions of property are invested in churches that are marvels of costliness and luxury; that for every dollar thus uselessly retired from taxable conditions the tax upon all remaining property is increased, what then? When they see a million dollars put into a church that for every practical purpose could be built for a quarter of that sum, what then? When they see churches which are simply combinations of private proprietary interests, which are bought and sold like stocks, or fractions of any other private property, what then? The Catholics, at least, furnish houses where all who come are theoretical on an equality, do the Protestants do this?

How far our supposed case is a representation of reality we leave our readers to judge. What we have said we have said by way of suggestion of the lines of argument for and against taxation. We give no opinion upon either side, but we would like to have the Christian world understand that if this question shall ever rise, in a practical form, there are weak points in its armor that must be mended before it can hope for a successful struggle. Indeed, we do not think the question would ever have arisen but for the schemes of church aggrandizement that are visible on every hand. If the church had always confined itself to the simple work of doing good to the country and the world, and if it had not retired

are practically useless for that purpose, the State would have had nothing to say except to give it God-speed. The question whether the church would be benefited or harmed by the taxation of its property is an open one. It may be that such taxation of its property is an open one. It may be that such taxation must come at last, as the only corrective of the disposition to grasp at power, whether social or political, on the part of the church, or to strive after sectarian aggrandizement.—Dr. J. G. Holland, Scribner's for April.

Hints on House-Cleaning.

A house-cleaning of the most thorough character at least once a year, is very essential, in a sanitary point of view, for the accumulated dust beneath the carpets and with which everything becomes time interpenetrated, is not the innocent thing some consider it. Dust is a curious compound of minute fragments of almost everything in creation, mixed with spores and germs of vegetable and animal life, which need only favoring circumstances to bring them into activity, and they may produce effects injurious or destructive to human life. Therefore the first necessity in house-cleaning is not to raise a dust, but to gather it together in such a manner that it can be quietly removed and got rid of. Before the carpets are taken up they should be sprinkled with a good coating of dampened material. The old-fashioned tea-leaves are good in their way, but can seldom be had sufficient quantities. Clean saw-dust, chaff, finely cut hay or straw, or coarse bran washed free from flour and dust, are all good substitutes for the tea-leaves. A liberal coating of such matter, well dampened, but not wet, spread upon a carpet and brushed smartly over it, will keep dust from rising, and at any time will improve its appearance. The water used to dampen this material would be made a disinfectant by dissolving in it a small quantity of carbolic acid; one part in two or three hundred is sufficient. The damp material may, when used for the carpets, be swept into one corner, and afterwards spread over the bare floor, more water being sprinkled over it, and used to gather the thick dust generally found beneath the carpets.

House-cleaning should commence at the top of the house and work downwards. In this case it may be undertaken by spells, with intervening rests.

After the floors are cleared, the walls and ceilings claim attention. If no special cleaning is needed, a brush of soft hair is the best to use on them to remove dust. Here I will describe an improvement on the common step-ladder. This is usually made with legs of equal length, and therefore a person, when using a long one, can not get quite so close to the wall as may be desired, and is obliged to reach over and run the risk of falling. A step-ladder should be made with the back legs shorter than the front ones, so that the back will stand almost perpendicularly. It may then be placed as close to the wall as may be desired. Any step-ladder may be altered by sawing off an inch or two off the back legs. A ladder should never be mounted unless the iron hook or cord to keep it from spreading is used.

A very beautiful whitening for walls and ceilings may be made by slacking the best lime in hot water, covering up to keep in the steam, and straining the milk of lime through a fine sieve; add to a pailful half a pound of common alum, two pounds of sugar, three pints of rice-flour made into a thin, well-boiled paste, and one pound of white glue, dissolved slowly over the fire. It should be applied with a paint brush when warm.

Paint should be cleaned by using only a little water at a time and changing often; a soft flannel cloth or sponge is better than cotton or a brush; a piece of pine wood with a sharp point should be used for the corners. Where the paint is stained with smoke, some ashes or potash-lye may be used. A soft linen towel should be used for wiping dry. Glass should not be cleaned with soap; a little paste or whiting and water should be rubbed over, and with another cloth it should be rinsed off, and the glass polished with a soft linen or silk handkerchief. Alcohol or benzine is a good thing to clean glass, and clean paper is probably better than any cloth, sponge, or towel; dry paper leaves an excellent polish. Marble may be cleaned with a mixture of two parts of common soda, one part of pumice-stone, and one of chalk, finely powdered, and tied up in a fine muslin rag; the marble is wetted with water, the powder shaken over it, and it is rubbed with a soft cloth until clean, then washed in clean water and dried with a soft linen or silk handkerchief. No soap or potash should be allowed on marble. A good furniture polish is made by melting two ounces of beeswax, one ounce of turpentine, and one dram of powdered rosin together, with a gentle heat, and rubbing on when cold, with a soft flannel cloth, and polishing with a soft linen or silk cloth. If for mahogany, a little Indian-red may be mixed in. Cracks in furniture may be filled with putty, mixed with Indian-red or burnt umber, to get the desired shade. When dry it will take an equal polish with the wood.

Duties.

Duties are often very difficult things to apprehend rightly. As everything is ultimately referred to duty, and as a great many things in this world are very dubious, it is manifest that duties are often very dubious likewise. There are not only clear, but dim and shadowy duties, if I may so express them, which are often very perplexing, and occupy much of man's time and thought. Often we find what we supposed to be a duty, and performed with earnest diligence, was a great delusion. Under these circumstances, it does seem to me that when we have before us an undoubted duty, one of those things which come under the axioms of morality, we can hardly lay too much stress on the performance of it.—Arthur Helps.

It is not until we have passed through the furnace that we are made to know how much dust was in our composition.

Presbyterian Ministers in Parliament.

The election of Rev. Professor Smyth as M.P. for the county of Londonderry has given rise to much discussion among Episcopalian. The principal ground of objection to Dr. Smyth is that being in 'holy orders,' and that of the 'lower order' of clergy, it is contrary to the statute law of the country that he should be permitted to take his seat in Parliament. The Rev. Dr. Kirpatrick, of Dublin, has given an exhaustive reply to these objections, from which we give the following extract:—"It must be gratifying to Presbyterians to perceive that a political event has suddenly secured for their ministers that public recognition which argument and remonstrance have hitherto failed to obtain. Until now it has been, I believe, one of the small but irritating grievances of which Presbyterians have had to complain that the ministers of their Church, because not episcopally ordained, have not been recognized as clergymen by the adherents of the Protestant Episcopal Church in this country. . . . Presbyterian ministers are now informed that they are taking a course which renders it impossible for Episcopalian to recognize them. I hope they will have the readiness to reply—'It is a matter of perfect indifference to us whether we are 'recognized' or not. If the members of our own Church accept our ministrations, we are perfectly satisfied. If they approve of our going to Parliament, there is no reason why we should pay any attention to the opinions of others. You say we are not clergymen. If we are not clergymen we must be laymen. Why should we not exercise the rights of laymen and enter the House of Commons if we can?'"

"Of course I do not for one moment admit that Presbyterian clergymen are not in 'holy orders.' But that expression I mean, not that they have been endowed with any mysterious virtues at their ordination, but simply that they possess the qualifications which fit them to be the ministers of a Christian Church, and that they have been set apart by the recognized authorities of their Church for clerical duty. But I do not consider that their ordination necessarily incapacitates them from any other employment, or binds them to a life long adherence to the profession upon which they then entered. Of course the expediency and propriety of a clergyman forsaking his ministerial work, and pursuing some other career, must depend upon the special circumstances of his case, and is a fair subject for discussion. But why a seat in the House of Commons should be thought a position altogether unsuited for a clergyman I am unable to understand. Bishops have a place in the House of Lords. They are, I presume, in 'holy orders.' It is from them that the lower clergy derive their clerical character; they are, in fact, the source from which those mysterious influences emanate which are supposed to disable their inferiors from occupying a similar position in the Legislature. The lower orders of the clergy are excluded from Parliament because they are clergymen; bishops, on the other hand, are summoned to Parliament for the same reason. Could anything be more inconsistent and absurd? If the presence of Bishops in the House of Lords is, as we are often assured, essential to the interests of religion in this country, why should the presence of a Presbyterian minister in the House of Commons be considered inconsistent with his clerical character, or with the declaration taken at his ordination that he had sought the 'offices of the holy ministry from love to God and a sincere desire to promote His glory?'"

The Pall Mall Gazette states that the question of the eligibility of a clergyman to be elected a Member of Parliament is likely to be raised in Ireland by petition—the case being that of the Rev. Professor Smyth, a Presbyterian minister who has been returned for the county of Derry. The Act states that the disability applies to "a clerk in holy orders." Professor Smyth must be named at this new title. He is certainly no more a clergyman by this law than other dissenting ministers who have sat and still sit in the House of Commons.

A Great Error in Modern Education.

I am not indeed, supposing that there is any great danger, at least in this day, of over-education; the danger is on the other side. I will tell you, gentlemen, what has been the practical error of the last twenty years,—not to load the memory of the student with a mass of undigested knowledge, but to force upon him so much that he has rejected all. It has been the error of distracting and embarking the mind in an unmeaning profusion of subjects; of applying that a smattering in a dozen branches of study is not shallowness, when it really is, but enlargement, which is the result of an acquaintance with the learned names of things and persons, the possession of clever duodecims, the attendance on eloquent lectures, and the friendship with scientific institutions, and the sights of the experiments of a platform, the specimens of a museum—that all this was not dissipation of mind, but progress. All things now are to be learned at once, nor first one thing, then another; not well, but many badly. Learning is to be without exertion, without attention, without grounding, without advance, without finishing. There is to be nothing inward in it; and this, forsooth, is the wonder of the age. What the steam-engine does to matter, the printing-press is to do to mind; it is to not mechanically, and the population is to be passively, almost unconsciously, enlightened by the mere application and dissemination of volume. Whether it be the schoolboy, or the scholar, or the youth of college, or the mechanic in the town, or the politician the senate,—all have been the victims one way or other of this most preposterous and pernicious of delusions. Who has lifted up their voices in vain, in length, lest their own institutions should outshine and should disappear in the glare of the hour, they have been obliged, as they could with a good conscience, to humor a spirit which they could not stand, and make temporising concessions at which they could not but inwardly