

# The Total Eclipse of the Sun

Written for the Deseret News by Sir Robert Ball, LL.D., F. R. S.

**A**STRONOMERS are at present busily engaged in making preparations for a great event on Aug. 30 next. On that day there will be a total eclipse of the sun. There have been, however, so many total eclipses within the recollection of most of us that the question may well be asked as to why we are to pay any particular attention to this eclipse among the number. The reasons are easily stated. In the first place, the duration of totality at the best stations is fairly long. The complete obscuration of the sun will last for 3 minutes and 59 seconds. No doubt under a combination of favorable circumstances eclipses can and do sometimes happen in which the duration of totality, as it is called, is considerably greater. In some eclipses it has been indeed nearly twice as great. On the other hand, in many total eclipses which have been deemed worthy the attention of the astronomer, the precious seconds of totality have been barely half as many as those which will be available next August.

But a special reason why we hear so much about the eclipse of this autumn arises from the fact that it can be seen under the most favorable conditions in localities easily reached by a few days' journey. The middle of the eclipse, that is the occurrence of totality at noon, can be observed by those who travel no greater distance than to the north of Spain. There, either at Burgos, or at a place one-third of the way from Saragossa to Madrid, or at Morella, there will be one of the sunniest of natural phenomena under the best possible conditions for observation.

## NOVEL METHODS OF OBSERVATIONS.

Of course, without leaving our own homes the eclipse of next August will be visible to some extent. It will be visible over the whole of Europe, and the greater part of Africa. It will be visible over the north Atlantic, and over a great part of Canada, and doubtless will be noted by many hundreds of thousands of observers. It may here be mentioned that an eclipse of this kind can be observed on a bright day when the sun is high in a manner which, though it may not be actually instructive from a scientific point of view, is certainly pleasing and picturesque. This observation is made, strange to say, not by looking up to the sun, but by looking down upon the ground. When the sun throws a shadow of a tree on the road, the rays of light passing through interstices between the leaves, form bright spots, which though we may not ordinarily notice the fact, are really images of the sun. When a large part of the disc of the sun is eclipsed, then the bright part is reduced to a crescent, and consequently each of the myriad little solar images on the ground present to us beautiful crescents.

A most satisfactory way of observing the phenomenon is to obtain the assistance of a telescope, and then to arrange that the image of the sun shall be thrown on a screen. By this device a greatly enlarged image of the sun is obtained and the excessive brilliancy is suitably reduced. The characteristic phenomena which makes eclipses so important are never exhibited when the phase of the eclipse is no more than a partial one. Complete extinction of the sun is necessary, or in other words it is necessary for the observer to take up such a position that the shadow of the moon shall pass over him as that shadow sweeps over the earth. It is with the object of getting into the track of the shadow that astronomers are now preparing for a visit either to Canada, or to Spain, or to Tunis, or to Egypt, for the line passes through these other countries as well as through Spain. The width of the shadow track is approximately 100 miles, but towards each end of the track the duration of the totality diminishes, so that to see the eclipse under the most favorable conditions a position should be taken as near as possible to the central line.

## THE PATH OF THE SHADOW.

Just 19 minutes before noon on Aug. 30, 1906, Greenwich time, the shadow cone of the moon cast by the sun, after rapidly moving through space, first strikes this earth. The place so honored is about Winnipeg, and the industrious farmers will there doubtless be astonished to see the rising sun appearing as a black globe. The shadow has fallen on the earth and now as a black spot about 100 miles in diameter it commences an eastern rush at headlong speed across our continent and oceans. In two or three minutes after its arrival it has crossed Hudson's bay, and then just five minutes before noon in London, the shadow launches from the coast of Labrador upon the Atlantic.

Over the Atlantic the black spot rushes. Generally, of course, the shadow is cast upon a mere waste of water, but it may no doubt occasionally happen that the mariner has to record in his log that he was overtaken by the shadow, that broad day was suddenly transformed into night, and any lights which happened to be burning on the vessel would then stream forth into the gloom with unexpected brightness. Nearly an hour is occupied in this ocean transit, during which, from the astronomer's point of view, the eclipse is wasted.

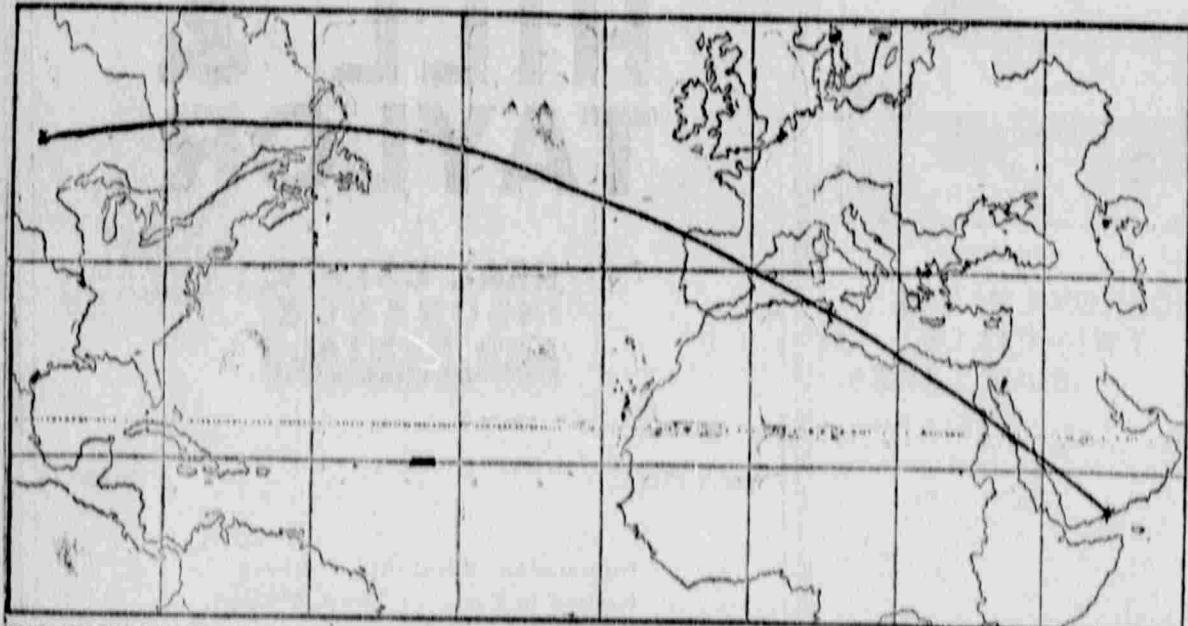
As the Greenwich clock shows 10 minutes to one, the sun being now high in the heavens, and consequently the opportunities for observation being at their best, the Atlantic journey is over, and the shadow enters Europe near Cape Finisterre. For about 25 minutes the course lies through Spain, and then the Mediterranean is reached. This sea is crossed till Tunis is entered about 1.46. Then again follows a passage over the sea, until Egypt is entered at 2.04. Twenty minutes later there is a crossing of the Red Sea, and now the earthly journey of the shadow is drawing to a close, and ends in Arabia at 2.32, having occupied 2 hours 46 minutes in its course from Canada. At the end of its track the duration of the totality is about two minutes, and it is nearly double as long in the central part of the track.

## EXPECTED RESULTS.

The circumstances of this eclipse are in every way so favorable that astronomers are making strenuous efforts to observe it at various places throughout its long journey. The eclipse will be observed before it leaves the American coast in Labrador, not only by American observers, but by astronomers who will travel thither from Europe. Then, of course, special attention will be directed to the observations in the north of Spain, and also in Tunis, and in Egypt. Thus at widely distant stations along the track, elaborate photographic appliances for detecting the appearance of the corona, and for obtaining information as to its spectrum, will be busily engaged. This wide distribution of the observing stations makes it highly probable that even if the weather be unfavorable in some places, it will not be so in all places.

Thus some results may be considered as practically certain; but there is another advantage of a very different kind. The duration of the total eclipse under the most favorable conditions still falls somewhat short of four minutes. There is thus but a very brief interval between the first and the last photograph that one observer can take. If, however, the corona be photographed at Labrador by one party, and at Egypt by another, there may be an interval of as much as two hours between the two exposures.

The importance of this will be appreciated when we bear in mind one of the principal problems which it is hoped this eclipse may enable us to solve. The mysterious corona, well shown in the admirable pictures taken on April 18,



MAP SHOWING PATH OF TOTAL ECLIPSE OF AUGUST 30, 1906, BEGINNING AT LAKE WINNIPEG AND ENDING ON THE ARABIAN COAST EAST OF ADEN.

## RETURNED MISSIONARIES

Elder William J. Flake of Snowflake, Navajo county, Ariz., returned home June 29, 1906, from this city July 1, 1906, for which he was set apart July 1, 1903. The Middle Tennessee conference with his field of labor, in which he reports a good work is being done, with room for more Elders.

Elder Brian Stringham of Bountiful, Davis county, returned July 8, 1906, from the British mission, where he has been laboring since June 21, 1904. In the Bristol conference, over which he presided during the last eight months, the work is making good progress and several new members have been added to the fold.

Elder George W. Webster of Taylorsville, Salt Lake county, returned July 20, 1906, from the British mission, for which he was set apart June 1, 1903. The first part of his mission he labored in various parts of the Scottish conference. The last year was spent in Aberdeen, where a branch of the Church has been organized of some 20 members.

Elder Stewart W. Eccles of Eden, Weber county, arrived in this city July 20, 1906, on his return from the British mission, where he was set apart May 6, 1903. He labored eight months in the Newcastle conference, and the rest of the time in Scotland, where the work of the Lord is progressing.

Elder Charles T. Richardson of Murray, Salt Lake county, also arrived home July 20, 1906, from the British mission, for which he was set apart Feb. 27, 1903. The conference of Birmingham and London were his fields of labor. The missionaries he says, are making good headway in the world's metropolis. Elder Richardson spent six weeks touring Europe after his release, visiting the countries of

France, Italy, Switzerland, Germany, Belgium and Holland.

Elder Stewart Eccles of Eden, Weber county, also returned July 20, 1906, on his return from the British mission, for which he was set apart April 19, 1904. He reports that she enjoyed her labors well, mostly tending in the city of Glasgow. She also traveled around considerably, visiting the branches and was ever busy. She had so many invitations to visit and talk with the people that she could not fill them all.

Elder Marantha E. Eccles of Eden, Weber county, also returned July 20, 1906, on her return from the British mission, for which she was set apart April 19, 1904. She reports that she enjoyed her labors well, mostly tending in the city of Glasgow. She also traveled around considerably, visiting the branches and was ever busy. She had so many invitations to visit and talk with the people that she could not fill them all.

Elder Herman H. Danielson of Lewiston, Cache county, passed through this city July 20, 1906, on his way home from the Scandinavian mission, for which he was set apart May 26, 1903. The conference of Christiania, Norway, and Copenhagen, Denmark, were his fields of labor. The work of the Lord is progressing, many are investigating the Gospel, a few are joining the Church, and many friends are made.

Elder Abraham Winward of Whitney, Ida., arrived in this city July 20, 1906, on his return from the Swiss and German mission, where he has been laboring since Sept. 3, 1902. In the Zurich and Bern conferences, where the work

is making progress.

Elder Orson Leroy Thompson of Farmers ward, Salt Lake county, returned July 21, 1906, from the British mission, for which he was set apart May 5, 1903. The work of the Lord in the Grimby conference, where he labored, is progressing very well. Many are investigating and the Elders are working hard to show them the truth.

Elder Yeppa Benson of Watson, Oneida county, Ida., passed through this city July 22, 1906, on his return from the Northern States mission, where he has been laboring since Jan. 8, 1904. In the Indiana and Northern Illinois conferences, where he reports the work is progressing nicely. The street meetings are a success. Many that listen to the Elders on the street are coming to the services at the Church.

Elder Abram E. Acord of the Fifth ward, Provo, Utah county, returned July 23, 1906, from the Colorado mission, for which he was set apart Aug. 1, 1903. The Nebraska, Denver and West Colorado conferences were his fields of labor, presiding in turn over the last two named. He baptized two converts, and assisted to initiate 12 others, blessed two babies, organized two Sunday schools, one Mutual and one Relief society.

Elder Rosel P. Hyde of Auburn, Uinta county, Wyo., reached this city July 25, 1906, on his return from the Eastern States mission, where he was set apart July 1, 1903. The work is progressing in the East Pennsylvania conference, where he labored. A good spirit prevails throughout the branch and prospects are fair for a good harvest during the summer.

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# Saturday Sermons.

WRITTEN FOR THE DESERET NEWS BY ELBERT HUBBARD.

**L**IFE is expression, and we are endeavoring to express the beauty that is in our hearts. This life is full of gladness, and, mayhap, it is the gateway to another, and to live well here is surely the best preparation for a life to come. God is good, and we are not afraid.

Socialism is simply the Golden Rule unimpaired.

A board of strategy never fights; a woman's congress always does.

That for which we clutch, we lose.

Self-preservation prompts men to move in the line of least resistance.

Men do not lack strength; they lack the will to concentrate.

A little seriousness is a dangerous thing; too much is absolutely fatal.

Abolish fear and you can accomplish whatever you wish.

A woman can forgive a beating, but to be forgotten—never.

The man who is always having his feelings hurt is about as pleasing a companion as a pebble in a shoe.

A CRIMINAL—One who does by illegal means what all the rest of us do legally.

Truth is so mighty that its potency has sometimes turned the heads of those who taught it.

And as the years go by and count themselves with the eternity that lies behind, I shall not be here; and my daughter will do as I have done and as you have done—stand by an open grave and ask in anguish: "If a man die, shall he live again?" And the falling clouds will give no sign, and the winds that sigh and sob through the trees will make no reply; but hope and love will answer, yes.

Speak well of every one if you speak of them at all. None of us is so very good.

If you would have friends, first learn to do without them.

Priests are not allowed to marry, because if they did, the secrets of the confessional would be called over back fences the next day.

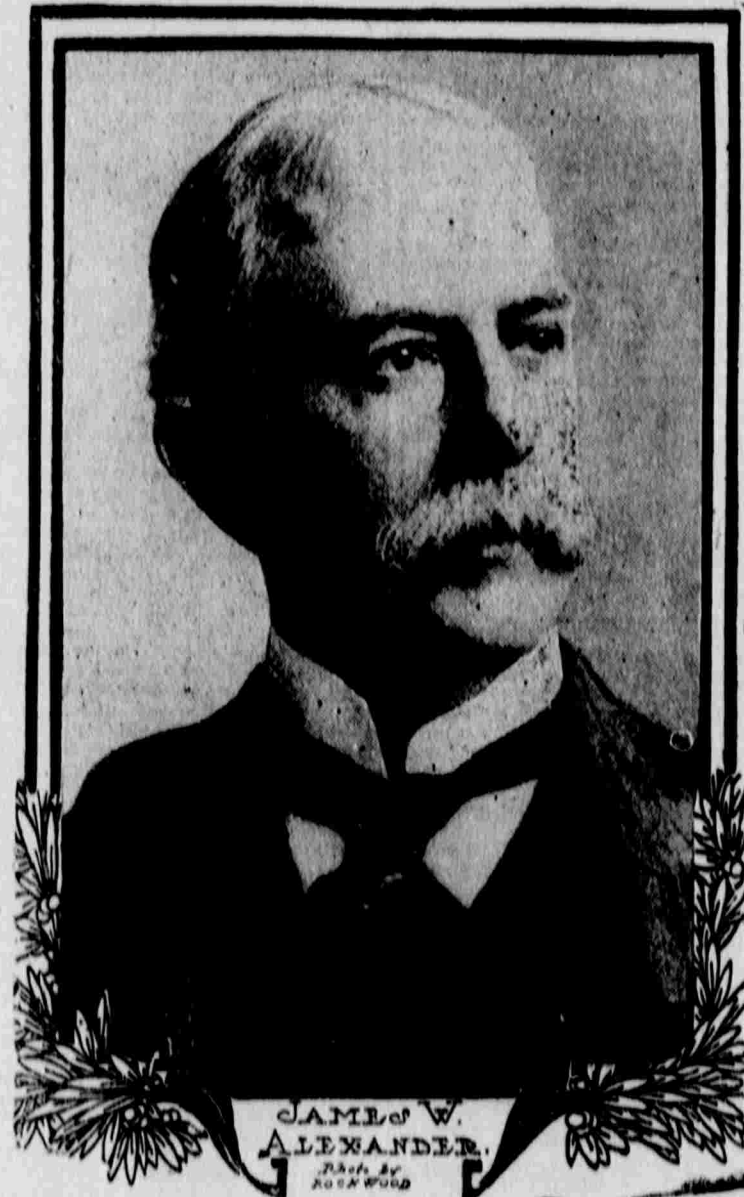
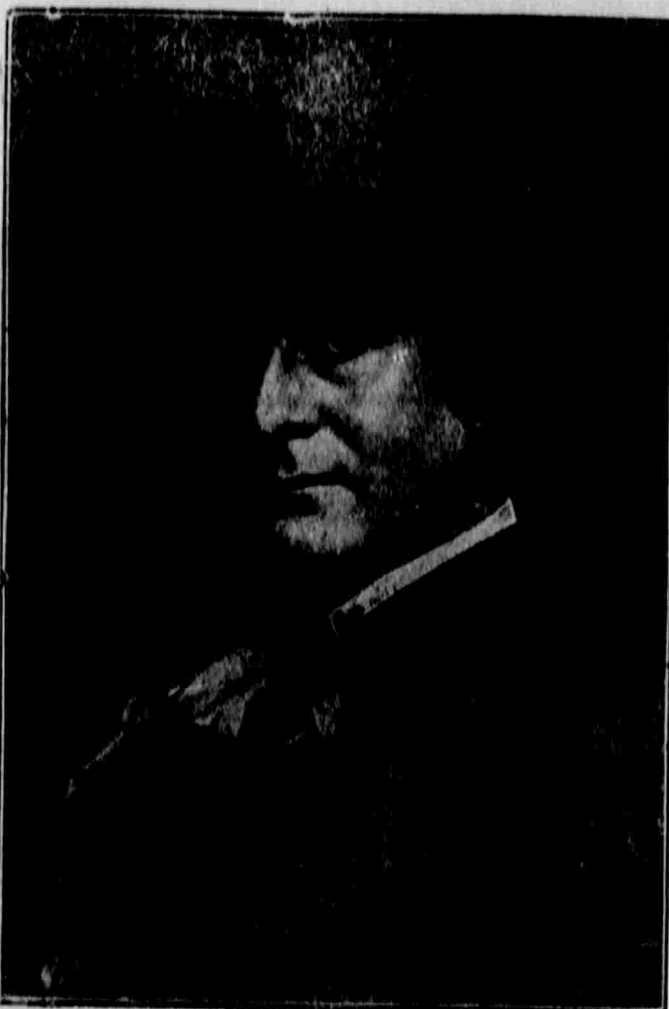
Our speech is intelligible only to our own. I enter into no arguments and deal in no apologies. If you do not comprehend me without explanations, you never will with them; explanations do not explain, and arguments very seldom convince.

We are not punished for our sins, but by them.

Many a man's reputation would not know his character if they met on the street.

The province of art is not to present a specific message, but to impart a feeling.

Genius is the capacity for evading hard work.



ALEXANDER A VERY SICK MAN.

John W. Alexander, former President of the Equitable Life Assurance Society, is now so ill at his farm near Babylon, L. I., that his death would not cause surprise. Mr. Alexander has nervous prostration and a kidney affection due to the nervous strain during the Equitable fight. The greatest precautions are being taken to prevent him from a relapse.

MITCHELL'S UNION HAS PAID \$1,500,000.



JOHN MITCHELL.

John Mitchell, president of the United Mine Workers' union of America, has spent \$1,500,000 to keep alive the strike in the mines of the Tennessee Coal and Iron company. This was asserted by a witness before License Commissioner Keeting. This revelation discloses the desperate and costly warfare engaged in between the mine workers and the company and shows how hard Mitchell and his men have had to fight to maintain their position.



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We collected this money for Mr. C. M. Plant of No. 267 west First North street, Salt Lake City, yesterday, from a note over 8 years old. The party fought the case in court and went into bankruptcy trying to beat him, but we collected it just the same.

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