

POOR DOCUMENT M C 2 0 3 5

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TWO CANADIANS ARE IN PARTY

Plans for Studying Eclipse of the Sun

British Expedition to Australia to Observe Phenomena on September 21—How the Einstein Theory Will be Tested—Wonderful Instruments.

(Canadian Press.)
Montreal, Que., Sept. 9.—(Written for the Canadian Press by R. H. Babbage.)—Prominent astronomers from all parts of the world, many of whom have traveled many thousands of miles, have assembled on the northwest coast of Australia to observe the phenomena of eclipse which will occur on September 21.

Professor A. Chant, professor of astronomy at the University of Toronto, and Dr. R. K. Young, astronomer in the Dominion Astrophysical Observatory at Victoria, B. C., are the Canadian scientists who will make observations during the few brief minutes of the eclipse. They arrived at their destination in the latter part of July. The chief instrument Professor Chant has taken is a camera with a lens of six inches aperture and a focus of eleven feet, mounted equatorially like a telescope and driven by an astronomical clock.

Great interest is being taken in the eclipse this year owing to the opportunity presented to obtain conclusive evidence either for or against what is known as the Einstein theory of relativity.

By the aid of the specially constructed telescope it will also be possible to study the corona, the remarkable solar appendage of pearly white color extending out some 200,000 or 300,000 miles which can be seen only when the sun is completely hidden by the moon.

The Canadian astronomers were joined at Perth by a New Zealand government astronomer and by a party under W. W. Campbell, director of Lick Observatory in California, the latter an experienced eclipse observer.

Professor Einstein, it was thought, might join a Dutch party from Java, which will observe from Christmas Island, where the Greenwich party will take up their positions. The path of the eclipse begins in Abyssinia, on the east coast of Africa, passes eastward over the Maldives Islands, Christmas Island and Australia, ending a short distance beyond New Zealand.

The northwest coast of Australia is, astronomically, the best point from which to observe the eclipse and to make the photographs of the light rays from the stars beyond the sun, because the duration of totality there is longest, the minutes, eighteen seconds; the altitude of the sun above the horizon is greatest, fifty-eight degrees; and the weather conditions are the most favorable, the coast of the Great Sandy Desert being virtually rainless and cloudless during September.

A subject that has been responsible for a large amount of scientific discussion and some public interest for the past few years is what is known as the Einstein theory, that a ray of light is influenced by a large gravitational field and is deflected by it. This theory, by the way, did not originate with Einstein, who is a German mathematician, but was collected by him from the observations of physical scientists in past centuries, its basis being the law of gravitation that a body left without sustaining support falls toward the earth at a fixed and established rate.

However, Einstein's assertion is that a large body like the sun will pull a ray of light from a star which passes near it out of its course, so that the star will appear to us to have shifted its position. The amount which the star will be displaced depends upon the gravitational pull of the body near which it is traveling, and can be calculated.

Although it is known that the sun is traveling through space at the rate of approximately thirteen miles a second, carrying the earth and all the other planets with him, yet so far as our system is considered, he is a fixed body around which all the planets revolve in more or less circular orbits.

It is possible to banish the enormous amount of light from the sun, it would be seen projected on a background of stars just as we see Sirius (which is a larger sun than ours), amongst the neighboring stars. The earth makes a complete revolution in a year so that the sun appears to follow a well-defined track (known as the ecliptic) returning

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to the same place, with respect to the stars, each year.

The moon revolving around the earth follows nearly the same track in the sky, but is in reality somewhat inclined to it, with the result that it is sometimes north, sometimes south, of the sun's path. Should it happen to cross this path at the point which the sun occupies, it passes between us and the sun, covering that body, and resulting in an eclipse of the sun.

On such occasions when the light from the sun is shut out by the moon, the surrounding stars appear. At the eclipse of the sun, the brightest star in the constellation of Leo, Leo may be recognized as the sickle-shaped group of stars to the west of Jupiter. Regulus is situated in the handle.

Testing The Theory. Members of the British and Australian parties have just completed a series of photographs of this part of the sky by means of the large telescopes with which photographs will be taken at the eclipse and it is hoped to obtain many of these stars on the plates.

If the positions of the stars are shown to be the same in both negatives, the theory of relativity will be considered erroneous in this fundamental point. If, on the other hand, the stars appear to the eye and to the lens of the stellar camera to be in a different position during the presence of the sun in front of them to that in which they appear on the photographic plates made by night previously, then the theory of relativity will be considered to have received great impetus, and astronomers will have to revise their ideas of the structure of the universe and the placement of a number of very important celestial bodies therein.

Perhaps a few details of what is known as the corona referred to at the commencement of this article, may be of interest. The corona is not arranged in concentric layers like an atmosphere, but is made up of complicated systems of streamers in general stretching out radially from the sun, but often curved and somewhat resembling auroras. Many of those who have seen it declare that its finely detailed structure resembles the great nebula in Orion. The coronal streamers often have their bases in the

regions of the active prominence. That they are in some way connected with activity on the sun is shown by the fact that the form of the corona changes in a cycle of about eleven years the same as that of sunspot activity.

When the number of spots is at a maximum the coronal streamers radiate from all latitudes almost equally. As the maximum passes, the streamers gradually withdraw from the poles of the sun and extend out to greater distances in the sunspot zones. When the number of spots is at a minimum the corona consists of short rays in the polar regions curved away from the solar axis and streamers extending out in the equatorial plane. At present the sun is near one of the periods of minimum sunspot activity and a corona of the latter type will probably be seen.

According to present ideas, the corona consists of dust particles, liquid globules, and small masses of gas which are widely scattered. From what is known it has been calculated that there is one particle of dust to every fourteen cubic yards of the corona. The excessive rarity of the corona is shown by the fact that comets have plunged through hundreds of thousands of miles of it without being sensibly retarded. It is these small particles that reflect the sun's light and allow us to see the details of that beautiful object. The form of the corona shows that its condition is not at all similar to that of an atmosphere like the one surrounding the earth. Its increase in density toward the sun is inexplicably slow, though, doubtless, the pressure of the sun's light, and the effect of electrical forces upon the small particles, which it is composed are opposed to the force of gravity. The radial structure and periodic variation in form are without satisfactory explanation. The opportunity of studying the

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corona is one of the reasons for the great scientific interest in eclipses.

The Equipment.

The British expedition which is making observations on Christmas Island is under the direction of H. Spencer Jones, chief assistant at Greenwich observatory, together with H. J. P. Melotte, who discovered the eight satellites of Jupiter. Most exact instruments, capable of registering the minutest detail of the eclipse of the sun, have been sent out from England and have been erected. The great telescope included among these instruments has been handled almost exclusively by native coolies under the supervision of members of the expedition.

The photographs taken on September 21 will be used in connection with a set taken in South America and West Africa in May, 1919, which indicated that the Einstein theory was correct. However, the reliability of the instruments used on that occasion has been questioned, hence the proposed observations.

The astrophysical telescope that has been transported from Greenwich to Christmas Island is probably the most highly valued of the numerous treasures of the British Observatory. In previous similar experiments it has been found necessary to point the instrument away from the sun, the photographs having been secured through the use of a mirror, which allowed for a slight miscalculation and fault in the results. In this instance the Christmas Island camera will point directly at the sun and through the use of a delicate mechanism will follow the sun through the eclipse.

The expedition from the United States is under the direction of Dr. W. W. Campbell, director of the Lick Observatory of the University of California, on Mount Hamilton, and left San Francisco on Sept. 1 bound for Perth, Australia, where they were transhipped to a vessel of the Australian navy placed at their disposal by the government of Australia, and proceeded to Ninety-Mile Beach on the north-western shore of Australia, landing in surf boats at a point about 200 miles north and east of Broome, the last landing place on that coast and only a small village itself.

The fruits of the elaborate and expensive preparations will mean much to the world's store of astronomical knowledge and it is hoped that the occasion of the eclipse will not be hoodwinked by rainy weather, at least not for a few hours before and after the phenomena.

PROTECTION FOR THESE POOR FISH

Authorities of Pennsylvania Find That Sewer Pollution of Rivers and Streams is Bad for the Fish.

Harrisburg, Pa., Sept. 8.—Investigations made by wardens and inspectors of the state department of fisheries have developed the fact that one of the most serious of all pollutions entering the streams is from sewers from cities and boroughs, according to Commissioner of Fisheries Nathan R. Buller.

In the last two or three weeks the department's anti-pollution officers have reported to Mr. Buller they have visited 150 manufacturing plants, and the co-operation of these establishments by installing basins and filters is mentioned. Eight prosecutions have been brought under the pollution act of 1917, but in other cases, Mr. Buller states, "a thorough investigation was made by the officers, and we are satisfied that many of the fish died from natural causes, due to the extremely low water in many of the streams."

It is likely the cases where sewage pollution killed fish will be taken on during the winter. The fisheries department will have twelve messengers on the road distributing young fish, including catfish, minnows, frogs and trout, "this fall for planting" as long as the streams remain open.

THREE MURDERS IN ONE FAMILY; FEAR VENDETTA

Identification of Body Leads to Theory of Old Italian Feud.

St. Catharines, Ont., Sept. 9.—Though the man whose body was found in the Welland Canal above Thorold, has been identified, the reason for his murder is still clouded in mystery as deep as ever.

A Welland Italian identified the body as that of Joseph Scaroni of Brantford, Ont., brother of Dominic Scaroni, who was shot to death near Lewiston, N. Y., four months ago. The present murdered man the Welland Italian said, is a blood relative of the Italian found murdered near Oakville, Ont., about the same time.

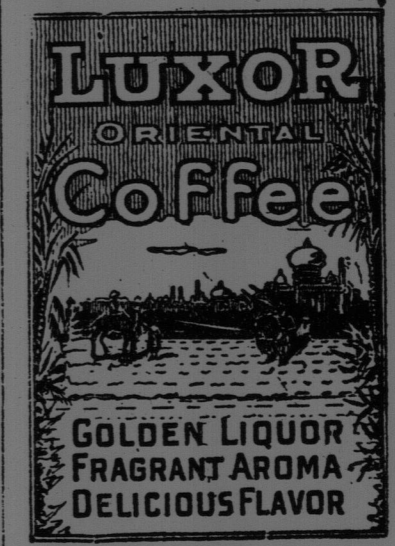
Believe Vendetta is Cause. The Italian gave it as his opinion that the murders were the result of an old family feud or vendetta, commenced in southern Italy years ago. What brought Joseph Scaroni to this district is a mystery, as it appears he was not acquainted here. This, therefore, strengthens the view that he was killed in some other part of the country and the body rushed to Thorold in an auto.

A fine gold watch that Scaroni usually carried is missing. Near the canal bank, in the vicinity where the body was found, the police discovered a freshly dug grave, not very deep. This indi-

cates that the murderers probably intended to bury their victim, but were frightened away, and so threw it into the canal in their flight.

DIES FROM SEVERE BURNS IN FURNACE EXPLOSION

Brantford, Sept. 9.—George Purran died in the General Hospital after suffering frightful burns, inflicted when a gas furnace at the Happy Thought foundry exploded. The furnace would not light when Purran first turned the gas on and he went away, leaving the pipes



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