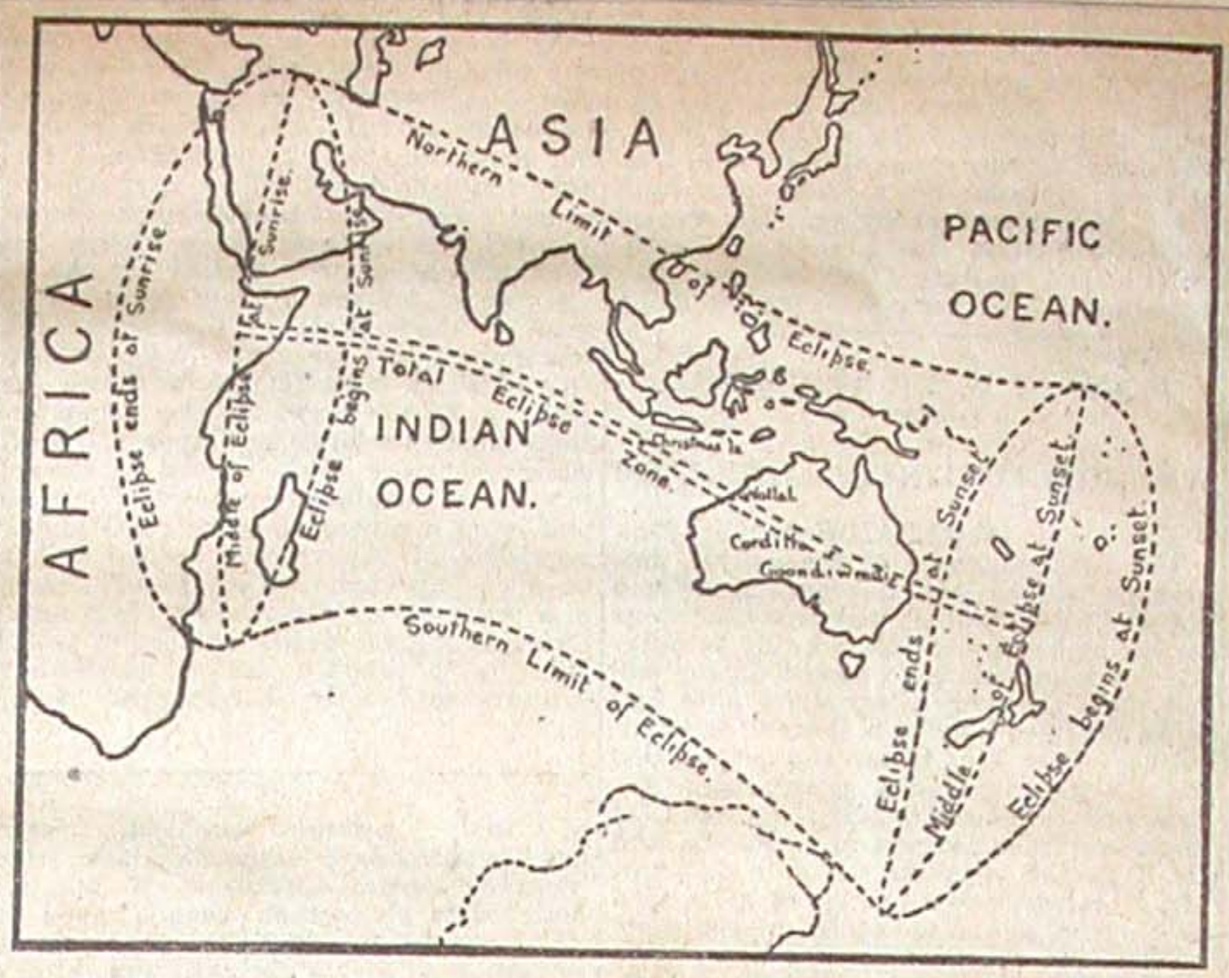
Register 21-9-22.

ALL EYES ON THE HEAVENS

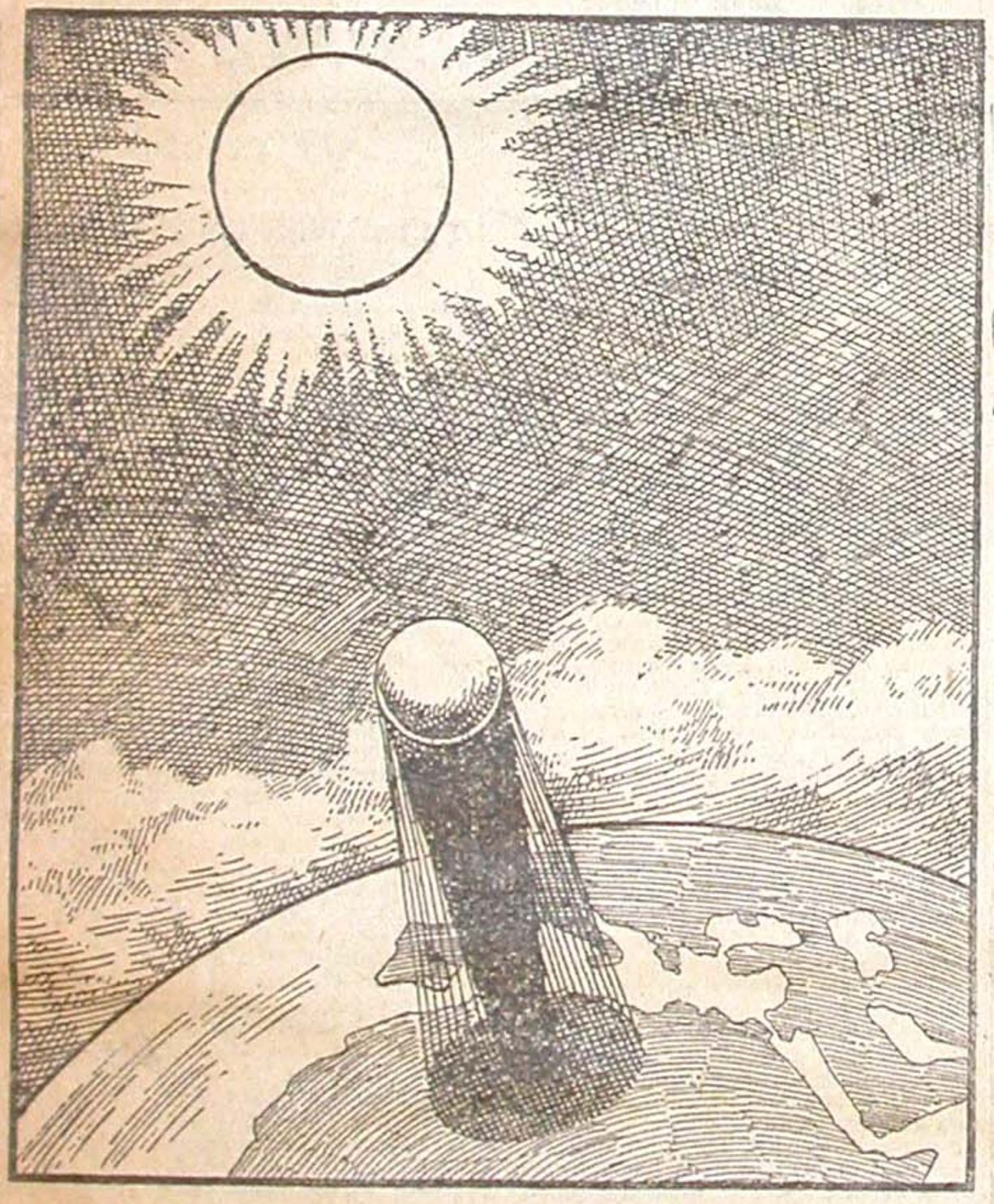
TO-DAY'S TOTAL SOLAR ECLIPSE

OCULIST'S WARNING TO OBSERVERS

The eyes of the scientific world will be upon Australia to-day. The eyes, adequately protected, it is hoped, of Australians will be on the heavens. For the first time in the history of Australian civilization a total eclipse of the sun will pass across the centre of the continent. In other parts of the country a partial eclipse, varying in degree according to the distance from the belt of totality, will be visible. Every year there are at least two solar eclipses, but much greater importance attaches to to-day's event, because of the unique facilities which will be accorded for scientific observation. As the ocean covers most of the surface of the globe it generally happens that the eclipse falls on the waters, but on this occasion it will include Christmas Island, and will travel across Australia from Wallal on the west coast, through Cordillo Downs and Goondiwindi, and over the coastline below Brisbane on the east, to a point in the sea due north of New Zealand. At each of the places mentioned groups of famous scientists, some of whom have come from the other side of the world, have established themselves, and the only link required to complete the chain of propitious circumstances for their delicate work is cloudless weather. From letters which have reached the Adelaide Observatory it seems that the impression has been gathered by some that the total eclipse will be seen from any point in the State. One man from the south-east, who thought this, wrote to say that he had imported a telescope from England to witness it. Another at Port Augusta enquired how he should fix his camera to his telescope to photograph the corona. In South Australia, from Mount Gambier, in the south, to Port Augusta in the north, from seven to eight-tenths of the sun will be covered by the shadow of the moon. The eclipse will begin at 2.22 o'clock in the afternoon, and will continue for about 2½ hours. It will reach its maximum at 3.32 o'clock. Nothing of a scientific value can be done at the Adelaide Observatory, but Mr. C. A. Maddern, who is in charge during the absence at Cordillo Downs of the Government Astronomer (Mr. G. F. Dodwell), and his assistants, will make telescopic observations, and will probably take photographs to check the positions.



Map showing portion of the earth's surface within which the eclipse will be visible.



A TOTAL SOLAR ECLIPSE.

This shows the shadow of the moon, cast by the sun and falling on the earth. The heavy shading represents the umbra or dark shadow of the total eclipse, and the light shading the penumbra or light shadow of the partial eclipse.

—What Will Happen.—

The accompanying picture conveys an excellent idea of what would be seen if it were possible to observe, from a point somewhere in space, the positions of the sun, moon, and earth when an eclipse occurs. The top disc, surrounded by a halo, represents the sun; the smaller one in the centre the moon; while underneath, with the heavy shadow of the total eclipse and the lighter one of the partial eclipse falling on it, is the earth. This drawing is for illustrative purposes only, of course, and account is not taken of the relative sizes of the three bodies. The moon has reached point in its orbit where it intervenes in a straight line between the sun and the earth, and is at such a distance that the tip of the shadow cone cast by it from the sun is cut by the earth's surface. The black spot on the earth represents the point from which the total eclipse is visible at one particular instant, while the lighter shadow round this black spot is the area from which the partial eclipse can be seen. What will happen to-day can be seen from the map published with this article. The black spot, the long diameter of which will be about 130 miles, will move from the east coast of Africa, south of Aden, across Christmas Island, Wallal, Cordillo Downs, and Goondiwindi, as shown by the double dotted line. The penumbra, or light shadow, is shown by the dotted oval. Soon after the beginning of the eclipse it will cover an area about 4,000 miles long and 2,000 miles wide. As it moves eastward from the coast of Africa it will alter until at Christmas Island it will be almost circular, and then it will begin again to assume an oval shape. As will be seen from the map, the partial eclipse, therefore, will be visible from the east coast of Africa, the islands north of Australia, New Zealand, New Caledonia, and the Fiji Islands.

—A Warning.—

A leading Adelaide oculist told a representative of The Register yesterday that after every eclipse he has had a number of patients whose eyes have been injured through gazing at the sun with the naked eye. After the last eclipse he had one case of total blindness. He explained that it is exceedingly dangerous to look at the sun during any portion of the eclipse. The injury to the sight would extend from temporary to total blindness, according to the normal strength of the eyes and the time that they had been exposed to the remaining portion of the sun. Not many people would look at it for long during the early and late stages of the eclipse, for the reason that it would be painful to do so. Most damage was likely to occur when the eclipse was at its maximum, because it would then be possible to gaze at it without much discomfort. It would be a great mistake, however, to suppose that because the eyes were strong enough to look at the partially-obscured sun without pain, they could do so without serious injury. There was also a mistaken belief that spectacles made eclipse gazing safe. Glasses, however thick, afforded no protection whatever, unless they were stained a dark colour. The glasses sold in the shops for sunglare would be safe, but it should be remembered that there were several shades in these glasses, and one of the darker ones should be used. A piece of ordinary glass well smoked was all right, or a used photographic plate would suffice. Another safe method adopted in other countries was to place a bucket of still water in the open, and look at the reflection in it.

—At the Schools.—

All State school teachers in South Australia have been instructed to use to-day's event for instructional purposes. A great deal of interesting information about the eclipse has been published in the September issue of The Children's Hour for Grade VII., and instructions to teachers have been issued in The Education Gazette. Teachers have been asked to supplement these explanations by one or two lessons during the week. This afternoon, at the appropriate time, all ordinary school work will be suspended, and the pupils assembled in the playgrounds, where they will make observations, under the direction of their teachers. The latter have been specially requested to warn the children of the risk they would run if they gazed at the sun without the protection of smoked or coloured glass, and directions have been given for the best methods of making protectors.

—Wireless Communication.—

The Lieutenant-Governor (Sir George Murray) on Wednesday received the following telegram, dated September 20, from Cordillo Downs, signed by Professors Grant and Mr. G. F. Dodwell:—"Glad to inform you that eclipse preparations are well advanced. Prospects of success are favourable. Wireless communication with Adelaide has now been established, through the arrival of Professor Woolnough and his party with a transmitter. They will assist in the eclipse observations."

—Eclipse Everywhere.—

It will be of great interest to many, and especially to children, to observe during the eclipse that the rays of light streaming through small holes into a darkened room (say through nail holes in the walls or roof of an iron shed), also through small interstices in trees, will all throw down perfect images of the eclipsed sun, instead of the round shots of light seen at ordinary times where light rays strike the ground (which are in reality images of the round sun). Another interesting experiment is to note the appearance of the shadow of a hand, for instance, thrown on white paper or a light wall. In an annular eclipse this yields a striking and peculiar effect, which will probably not be so pronounced in a partial eclipse. It may be worth photographing.

—Fairly Favourable Conditions Predicted.—

When approached on Wednesday morning the State Meteorologist (Mr. E. Bromley) stated that there was a possibility of cloudy weather to-day, owing to the high-pressure system which was drifting towards South Australia. However, late on Wednesday night, Mr. Bromley said the "system" previously referred to was not a very energetic one, and he expected that it would have drifted fairly well across by to-day, and that the conditions, therefore, would be fairly favourable for observation. Although there might be clouds, he thought that they would be broken. Although on Wednesday night the sky was clear and practically cloudless, that was rather deceptive, as there were no sun's rays, which were responsible for the formation of clouds. "However," concluded Mr. Bromley, "so far as one can foretell, the conditions are likely to be fairly favourable, if the weather does not take any fits into its head."