

TOTAL SOLAR ECLIPSES.

DR. CAMPBELL'S ADDRESS.

With the arrival in Adelaide of the American party of scientists who are on their way to Walla, Western Australia, to make observations on the total solar eclipse, which will occur on September 21 next, public interest has been aroused. Dr. W. W. Campbell, the leader of the expedition, who has been described as the greatest living observer of solar eclipses, delivered a fine address at the Commonwealth Club's luncheon in his honour on Friday. On Saturday evening, in the Prince of Wales Theatre, University, North terrace, Adelaide, at the request of the Graduates' Association, he gave a lecture on "Total Solar Eclipses," to a distinguished gathering. The seating accommodation was taxed to the utmost, and among those present were the Lieutenant-Governor (Sir George Murray) and Miss Murray, and most of the University professors. The chair was occupied by the president of the Graduates' Association (Professor Brailsford Robertson).

—The Einstein Theory.—

Beginning with a map showing the course of the shadow of the eclipse across the earth, Dr. Campbell showed a number of fine photographic lantern slides. He indicated the various places at which land observations might be taken, and explained the advantages and disadvantages of each. He had selected Walla in Western Australia as the spot for his expedition, partly because at that place the eclipse would be of longer duration than at almost any other available point of observation, and partly because the records showed that during September, in past years there had been clear skies and an almost entire absence of rain. A British expedition would observe the phenomena at Christmas Island. The total eclipse there would not last quite as long as at Walla, but the place possessed features which would make it particularly suitable to the work they proposed to do. The British expedition, Dr. Campbell explained, intended to pay special attention to work which it was expected would either confirm or disprove of certain propositions of the Einstein theory. In 1913, Einstein had stated that if certain groups of stars were photographed during an eclipse of the sun, it would be found that the rays of light would be displaced on the plates about $\frac{1}{8}$ th of a second of an arc, as compared with similar photographs taken at night time when the stars were in approximately the same relative positions to the earth. At an eclipse of August, 1914, Dr. Campbell's expedition went to Russia with the intention, among other things, of testing this theory, but the sky was so clouded that they got no results at all. Later they made plans to test the theory in the United States of America, but owing to conditions consequent upon the war, they were unable to have the use of the instruments which they had taken to Russia, and five weeks before the date of the eclipse they began to improvise apparatus for their work. The lenses, however, were not suitable, and although evidence was secured which in their opinion tended to confirm the Einstein theory, it was not regarded as conclusive. For that eclipse British expeditions went to Africa and Brazil. The African expedition was only partially successful, owing to cloudy conditions, but at Brazil results were obtained which it was thought were in the direction of confirmation of Einstein's theory. British astronomers, however, were the first to suggest that the observation should be repeated at the forthcoming eclipse. The lecturer explained that these displacements of rays of light would be very minute if they existed at all on the photographic plate, and to make sure of the accuracy of their calculations they had to supplement the photographs taken during the eclipse with other photographs of the same group of stars taken in the night time in order to get plates with the images unaffected by the presence of the sun in the midst of the group of stars, under consideration. Several of these plates had already been secured. He hoped the Adelaide expedition under the Government Astronomer (Mr. G. F. Dodwell), and of which Professor Kerr Grant was a member, were also obtaining similar plates. If they had not done so already, it would, of course, be possible for them to get the pictures at a later stage, when the groups of stars were again in a similar position.

—The Sun's Corona.—

Professor Campbell displayed views showing photographs which had been taken at previous eclipses, and pointed out the variations in the sun's corona. He said that from a scientific point of view, a partial eclipse was not worth looking at. Total eclipses occurred somewhere in the

world about once in two years, and these had been observed for the last 60 years, but as the totality lasted on an average for only about three minutes, it made the aggregate time of observation under the conditions of total eclipse only approximately 90 minutes for that period. There was no phenomena in Nature more interesting than a total eclipse. On September 21 next people need not expect midnight darkness during the time that the sun was obscured. They would probably get a condition such as existed about midtime between the setting of the sun and the darkest hour of night. When the eclipse was nearing its full, the darkness would increase rapidly, but it would never be complete. It would be interesting for astronomers to watch how the corona would flash into view when the body of the sun was obscured. Until about 60 years ago the corona had attracted little attention, although its existence was well known. Prior to that time it was not believed to be part of the sun itself. The discovery was first made by British astronomers. In placing on the screen views illustrating the different phases of the corona, Dr. Campbell mentioned that some of these were decidedly irregular, and showed streamers running out from the body of the sun for a distance of 2,000,000 miles. He said he would not trouble the audience with astronomical figures generally, as no one, not even an astronomer, was able to grasp these distances. The Adelaide expedition at Cordillo Downs would have a six-inch telescope, and his expedition at Walla a five-inch instrument. It was expected that the condition of the sun would be a little brighter at Walla than at Cordillo Downs, consequently a 5-in. telescope would be sufficient. It was important, for scientific purposes, to endeavour to ascertain some knowledge of the motion of the coronal structure. Already they knew that there was such motion, because the form of the corona was continually changing! The lecturer described the method which had been applied in the study of the component parts of the sun. A generation ago, he said, it had been suggested that the coronal materials surrounding the sun were thrown into their varying shapes by magnetic force. An American astronomer had proved that the sun was a great magnet. Having explained the chemical composition of the sun, Dr. Campbell showed views of the Lick Observatory and the giant instruments there, and explained the advantage of the moving floor, which was the first of its kind ever used, although it was a British invention. The reflecting telescope—the gift of an Englishman to the observatory—was the godfather of a number of others some of them of larger proportions than that now in use.

—The Lecturer Thanked.—

At the conclusion of the address the Lieut.-Governor said they could not allow Dr. Campbell to leave without expressing their thanks to him for his informative, interesting, and enlightening lecture. They had never before had the privilege of meeting a more distinguished astronomer than Dr. Campbell. Besides being a distinguished man, he was a man of extremely good nature, and had consented to give the lecture at once when asked to do so. They also welcomed the other members of the party—Dr. Chant and Mrs. Chant, and Drs Adams, Moore, and Young. They had come a long way and taken a great risk, and it would be extremely disappointing, if the weather conditions should prove unfavourable. He trusted that the observations would be all that the party desired, and that they would be able to confirm or shatter the Einstein theory. (Laughter and applause.)

Professor Mitchell (Vice-Chancellor of the University) seconded the motion of thanks, which was carried with acclamation.

Dr. Campbell, in responding, said the party had been given every assistance from the Commonwealth Government, and had received an unexpected welcome which was beyond their imagination.

SCIENTISTS' TRIP TO THE HILLS.

The visiting party of astronomers to Adelaide were conducted on a motor tour of the hills on Saturday afternoon. They made the outward trip via Norton's Summit, and called at the residence of Sir Langdon Bonython at Mount Lofty, where they were entertained at afternoon tea. The return journey was by way of the Mount Barker road. The outing was most enjoyable. The party joined the East-West express on Sunday morning en route for Walla, Western Australia. They were bidden farewell by members of the professional staff of the University and others. Among those present was the South Australian Government Astronomer (Mr. G. F. Dodwell, B.A.), who will lead an official party to view the eclipse at Cordillo Downs. Mr. Dodwell returned to Adelaide on Sunday morning after having attended the International Geodetic Conference.

THROUGH DARKEST RUSSIA

FAMINE AND DISEASE DESCRIBED BY PROFESSOR ATKINSON.

No one who heard Professor Meredith Atkinson, formerly of the Melbourne University, deliver his illustrated lecture on "Through Darkest Russia," at the Town Hall on Monday evening, could have failed to realise the extent of the starvation and misery in Russia to-day. It was a plain unvarnished tale of his experiences in that country and of the need for relief in order to save the thousands of hungry and disease-stricken children of that land. Millions of people have already died, and millions more are in urgent need of assistance.

Professor Mitchell, of the Adelaide University, presided, and said it was no spirit of curiosity, but one of sympathy, that took Professor Atkinson to Russia at his own expense, and he hoped those present that evening would share in the sympathy. (Applause.)

Professor Atkinson explained that this was one of a series of meetings organised by the Save the Children Fund, the Society of Friends, and the British Appeal Committee, and his object was to state the case for the starving millions in the Volga regions. He had been chosen by the appeal committee in London to cross Russia, and present an impartial report on the conditions existing in the Volga regions. He had travelled most of the way by himself, and he had seen Russia in all her startling nakedness and in all the tragedy of her disaster. He could claim to have been down into the pit of Russia's agony, and to have witnessed such misery as could never be erased from his memory. It was not an emotional and hysterical tale that he had to tell, but a tale of absolute wretchedness and misery. He had seen many acts of sacrifice on the part of mothers, many of whom died as they stood or walked. Peasants in various guises were devoting their lives to the salvation of their little ones. British and American relief workers were literally laying down their lives in order to relieve the sufferings of the Russian people.

The key to the relief of the suffering population, said the professor, was transport. The thousands of miles of roadways had been torn into fragments by the destruction of all bridges throughout the vast country. It was only during the past twelve months that a few bridges had been repaired, and famine relief work had been made possible in the regions of the Volga. They should imagine a huge country like Russia in such a condition that it could no longer support more than one fiftieth of its population. He had been in many villages, in which there was not a grain of Russian food, and to which every particle of food was carried by willing hands. He had been in villages where people ate clay and refuse in order to appease their hunger, but, of course, they died, and he had seen black and twisted corpses on the roadside disappear during the night, having been eaten by the survivors. The relief workers had a trying time, and the strain upon them caused by the sufferings of the people was almost intolerable. They could imagine a handful of British workers settled down in a remote village with nothing to read, and their candle supply running short. Night there came on at 4 p.m., and ended at 8.30 a.m. All they could do was to go to bed, and next day the same routine of dreadful horror confronted the eye. It was little wonder that two days before he left London for the Geneva Conference one of their workers had committed suicide. He had become broken in spirit, and was unable to bear the strain any longer.

"It was my lot to travel with the Chief Administrator in Russia," he said, "and also to meet the deputations of mothers who came to us, kneeling in thankfulness and asking us to tell the British people how they were worshipped by the famine-stricken in the Volga regions, because of the magnificent relief work that they were carrying out. In replying I told them that many thousands of kind people in Australia were helping the Russians by contributing to funds. You should have seen the glow of emotion that came over the faces of those Russian mothers.

on the famous front of the Volga is now being laid the foundation of a new world founded on the spirit of the nations, united with one another for the uplifting of humanity. As we went through the cottages it was our business as relief officers to descend suddenly to cottages to discover whether the women were really giving the food to the children, and not feeding themselves. Our inspectors have visited thousands of cottages, and not a single case has been reported of a starving mother having taken the food of her starving child. I have seen mothers tramping along the road obviously dying of typhus, and refusing to give in until they dropped. I have seen a mother drop dead with her baby in her arms as she was struggling to reach the nearest town. I have seen, too, refugees who had tramped 150 miles in an effort to obtain relief."

The lecturer said they had killed the famine in Poland, Austria, Czechoslovakia, Hungary, Roumania, and Turkey, and the only two countries left famine-stricken were Russia and Armenia. They were now out to kill the famine in those countries, and they would do it by next year. (Applause.) The British people from private funds had supplied 2½ million pounds for the relief of Central Europe, and the Americans, in addition to doing the same, had persuaded their Government to set aside five million pounds for the relief of Russia alone. At present Mr. Hoover's administration was feeding no fewer than 1,000,000 Russians in the Volga area alone. Mr. Hoover had informed him that the American Government were prepared to allot another five million pounds next year, because they were prepared to kill the famine. During the present year only a one-third harvest was obtained in Russia owing to the breakdown of the transport system in April, but by next April they hoped to have a full crop sown, and that would bring an end to the famine in the following summer. Therefore, a final effort now was worth while. If they ceased their work now, many of those who had been saved would die. It required £1 to save a Russian life.

Referring to the typhus scourge, the speaker explained that he was the only one of a party of seven who got back to London. The others died or became so ill from nervous prostration that they would never quite recover. The scourge was so terrible that he had cabled to London from Moscow to prevent women from going to the typhus areas, because women were too susceptible to the disease to undertake relief work there. When he returned to London he felt really ill. He could not have lived through it in Russia for another month. The scenes in some of the cottages were ghastly. The relief workers attempted to save only those whom the doctors knew would, by proper feeding, grow up strong and well. Some were too ill to be saved, and in such cases the nurses fed them with warm milk until they died. Not an ounce of food was wasted, and though in places the transport was most difficult the leakage was less than half of 1 per cent. That loss was far less than at any port or railway centre anywhere. An armed guard accompanied each relief train, and the relief workers had powers of life or death over anyone who interfered or attempted to steal. The statements that the food sent did not reach the children were not true. The work was carried out in conjunction with village committees, and the organisation was simply remarkable. Early in the work they devoted their efforts towards saving the children only, and the fathers and mothers never asked for food for themselves. Now, however, they were feeding nearly half a million parents as well as children. He had met thousands of children in Russia who did not know their names, so terrible had been the disruption. He asked the audience to contradict mis-statements that the famine in Russia was over and that there was a bounteous harvest. There were still in Russia 30 millions of starving people, but their worst troubles would be over if they could be fed for the next nine or twelve months. He appealed strongly for their help.

To illustrate the lecture photographs and cinematograph views were thrown on the screen and explained by the professor, who was fully believed by the audience when he said that the great plague of London paled into insignificance as compared with the size of the disaster in Russia. If all the people in Great Britain went without one meal a week, he said, the famine could be ended. The pictures showed the awful plight of thousands of Russians who were famine-stricken and seized with the dreaded typhus. Children, whose emaciated forms excited the utmost pity, were seen at the soup kitchens enjoying their food; others were dying from typhus; and the burials of the unfortunate victims were also seen. Following came scenes of happy children whose lives had been saved through the relief work.

A collection was taken up, and £120 was contributed. This, Professor Atkinson said, would be sufficient to establish one kitchen, and the money would be sent forward at once. Dr. Krakowsky sold some thousands of roubles as souvenirs, and the sum of £18 was realised. It was explained that in Russia a quarter of a million

one should give this preparation a trial. Every person who has eaten in any of these ways are usually quick and effective.