

Advertiser 6.9.22  
Electrolytic Zinc Works  
Hobart.

Mr. F. W. Reid, principal of the School of Mines, returned this week from a visit to the electrolytic zinc works at Hobart, Tasmania. Those works, treating zinc concentrates from Broken Hill, are the second largest of their kind in the world, their present output being 75 tons of metallic zinc per day. This will shortly be increased to 100 or 120 tons. After the extraction of the zinc the residues are shipped to Port Pirie for the recovery of lead and silver.

League of Nations. } Register  
Prof. Naylor. } 7.9.22.

"STAMPING ON MATCHES."  
"If little is heard of the work of the League of Nations," said Professor Darnley Naylor, speaking at the W.C.T.U. Convention on Wednesday afternoon, "it will be because that League is doing its work well. If you live next a powder magazine and see a match burning dangerously near, and stamp it out, there won't be anything about it in the newspapers next morning, but it will be better for the neighbourhood than much publicity. The league's work is to be continually treading out fuses, and stamping on matches, and so preventing explosions which might easily wreck the world's peace. If the league was continually interfering it would be a failure. It has, at any rate, brought into existence the only constructive organization capable of dealing with the situation. If that fails, nothing can save us from the abominations of another world war."

Dr. Heaton in N.A.  
Daily Herald 7.9.22.

Among the callers at the "Worker" Office this week, wrote the Westralian "Worker," of Friday, September 1, was Dr. Herbert Heaton, whose lecturing visit to Perth is proving highly successful. To-day a number of union officials are entertaining him at luncheon. The distinguished visitor is a gifted speaker, who puts his case in simple and easily understood language.

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### THE ECLIPSE.

#### PREPARATIONS AT WALLAL.

Wallal, September 7.  
The work of erecting the instruments at Wallal Camp, in preparation for the solar eclipse, has proceeded apace during the week. On Monday the Lick Observatory party erected a tower to support a great 40-ft. camera. This tower is a very conspicuous object in the landscape for miles around—the top rising high above the tallest trees. To prevent the structure from being swayed by the wind, the light oronon framework has been enclosed in a second tower frame, and the latter will be eased with canvas prior to the eclipse. The 40-ft. camera was hoisted into position this morning. The upper end rests on the summit of the tower, and the lower end on the ground. The frames of twin 15-ft. cameras, and of twin 5 ft. cameras, for investigating the Einstein effect, have also been hoisted into their supports. The 15-ft. camera pair weighs, complete, considerably more than half a ton, and as injury to the bearings would ruin the instruments, the erection of the apparatus employed the entire personnel of the party.

Professor Chant (leader of the Canadian party) has also completed the erection of his 11-ft. Einstein camera, and both American parties are now busy with the adjustment of their large cameras by star observations. As the moon was full on Wednesday, some of the Lick astronomers decided to use it to standardise some photographing plates to be used at the eclipse. At about 10 o'clock, and again at half-past two in the morning, the moon attained the same altitude as the eclipsed sun will have on September 21. Much disappointment was felt when a dense wet mist came soon after sunset, blotting out the stars. Fortunately, however, the mist cleared at about midnight, and photographs were secured in the morning hours, under ideal conditions. So far the weather conditions here have been very satisfactory. Perfectly clear skies have been obtained day and night. The Indian, English, and Western Australian parties are also making good progress with their preparations, and the leaders are confident of having everything in complete readiness prior to the important day.

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### SUN'S ECLIPSE.

#### HOW IT OCCURS.

A simple, yet most illuminating, article appears in the latest number of the admirable journal The Children's Hour on the forthcoming eclipse of the sun. "Let us," says the editor, "try to master the more important details connected with an eclipse of the sun. The earth, which to most of us appears a stationary body, is really moving at the amazing rate of 19 miles a second as it carries us along in its annual journey round the sun. While the earth is moving, the moon is revolving round it. The moon's circuit around the earth is completed in 29½ days, or a lunar month. As both the earth and the moon are opaque bodies, they cast shadows which are caused by the sun's light falling on them. These shadows are cone shaped, or similar to the head dress known as a dunce's cap. We may picture then the earth and the moon on their never-ending journey each throwing far into space, and away from the sun, their dark shadows. The length of the earth's shadow is about 100 of its diameters.

#### —Astronomers' Opportunities.—

People on the earth's surface on which the umbra (shade) falls find that for a brief time the sun is completely hidden; that is they are witnesses



THE GOVERNMENT ASTRONOMER (MR. G. F. DODWELL).

sing a total eclipse of the sun. But the dark area of the earth on which the umbra falls is comparatively small; it is circular or, to be more exact, elliptical in shape, and with a long diameter never exceeding 170 miles, frequently it is much less. People living on the area on which the penumbra, or lighter shadow, falls, see a part of the sun's face obscured; they are in a partial eclipse. Every year there are at least two total eclipses of the sun, during some years there as many as five eclipses; but because the circle of darkness cast by the moon's shadow is so small few people are able to witness it. Astronomers are able to calculate the exact time and path of an eclipse, and to make their observations they carry their telescopes to a land on which the dark shadow will fall. No total eclipse at any one place lasts more than seven minutes, and then the observing point must be at or near the equator; north or south of that line the eclipse is briefer. It is therefore essential that for astronomers to make the best of the short time they have for observations that it shall not be a cloudy or rainy day. They feel more hopeful if they can arrange their telescopes and other instruments at a place where there is not a high rainfall; a shower of rain on the eventful day may spoil all the work that has taken months of preparation.

#### —At Cordillo Downs.—

It will be a total eclipse on September 21, and will pass over Central Australia. This is the first total eclipse visible in Australia since white men settled in it. The Government Astronomer (Mr. G. F. Dodwell), with a party of scientific men, have gone to Cordillo Downs, a large sheep station belonging to the Beltana Pastoral Company. It is nearly 800 miles from Adelaide, and is situated near the north-eastern corner of South Australia. They have taken with them some costly instruments lent by the Lick Observatory in California (U.S.A.) There is a powerful telescope and a huge camera. This has a focal length of 40 ft. It will be used

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to photograph the bright halo of light that can be seen for a few seconds during a total eclipse. This halo is known as the sun's corona. From behind the dark body of the moon streams of rose-coloured flame, often millions of miles in length, shoot out from the heated mass of the sun. There is another knotty problem that may be solved at Cordillo Downs. From text books dealing with the study of light we learn that light rays reaching our eyes, even from the most distant stars, travel in straight lines. A few years ago a great thinker named Einstein startled the scientific world by asserting, among other things that light rays may not always travel in lines exactly straight, for, states Einstein, if the star rays in travelling pass near a sun they are slightly bent; consequently, when they reach our eyes, we think we see the star in a place slightly different from its real position. Already, at Cordillo Downs, the astronomers have photographed the star field in which the sun will be eclipsed; this photograph will be compared with one taken on the day of the eclipse and the altered positions of the stars may prove that Einstein's views are correct, and that light rays, like any material substance (the earth, moon, and planets) come under the attraction of the sun.

#### —From Africa to Australia.—

The umbra, or the moon's dark shadow, moves very rapidly over the surface of the globe. Its rate is 1,830 miles an hour; 30½ miles a minute; or rather more than half a mile a second, and, because of the moon's motion, moves from west to east. The long diameter of the dark ellipse called the umbra as it falls on any part of Central Australia will be about 130 miles. The eclipse will begin on the east corner of Africa, south of Aden, and move westward across the waters until it falls on Christmas Island. On this island a party of British astronomers have their telescopes and cameras ready to make their observations. The eclipse there will take place at noon, when the sun is at its highest point in the heavens. At the time of total eclipse there is only 3½ minutes, and as Christmas Island has a rainy climate, they may have the ill fortune to miss the eclipse. Let us wish them good luck. The first point on the Australian coast on which the dark shadow will fall is Wallal, a small telegraph station on the north-west coast of Western Australia. Here the total eclipse is timed to last 5½ minutes. As Wallal is in a very dry country it is unlikely that a shower of rain will interfere with the observations there, but light cirrus clouds frequently come up from the sea, and if they are overhead on September 21 the astronomers there, some who have come all the way from Toronto University, in Canada will not feel very sweet-tempered. From Wallal the total eclipse will pass rapidly over the sparsely inhabited parts of Central Australia, the blackfellows and kangaroos shrinking with fear and the birds going to roost, as in the early afternoon the bleak shadow falls on them. By about 2 o'clock in the afternoon, or 35 minutes after the shadow of totality leaves Wallal, it will have reached Cordillo Downs, where Mr. Dodwell and his friends will be ready to make their observations. At Goondiwindi, in the south-east of Queensland, a party of astronomers from Brisbane and Sydney will be on the alert to gain information. The moon's shadow will pass on over Lismore, on the north coast of New South Wales, and then move across the waters of the Pacific Ocean and end at sunset somewhere in the ocean north of New Zealand.

#### —At Adelaide.—

The beginning of the eclipse at Adelaide will be at 2.30, at 3.32 about 75 of the sun's face will be darkened, and at 4.36 the eclipse will have ended. Those folk who have the good fortune to be in the zone of totality will never forget their experiences during the few minutes of total eclipse. Although for a brief time the moon will obscure the face of the sun, complete darkness will not cover the earth; there will be enough light by which to read ordinary print. But many stars will be visible; the air will be chilled; a mysterious silence will fall on the land, for the birds will have put their heads under their wings and the insects' hum ceased. Astronomers tell us that this total eclipse will be the most impressive sight ever witnessed by white folk in Australia.

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### EDUCATION.

#### ADDRESS BY PROFESSOR CHAPMAN.

Under the auspices of the Burnside and Beaumont Progress Committee, Professor R. W. Chapman, of the Adelaide University, delivered an informative address in the Burnside Public School, on "Education."

After referring to the benefits derived from a national system of education, such as that in vogue in all the States of the Commonwealth, the professor remarked that Sir John Monash had told him he considered that, taken on the whole, the Australian soldiers were the best educated men in the Allied army in France during the Great War. The splendid ground-work provided by a compulsory system of primary education was, in his opinion, the chief factor in developing the qualities of initiative and resource, which were conspicuous traits in their characters. After referring to the efforts made in different States to overcome the difficulties of providing some education for the children out-back, the professor said he did not agree with those who compared the path of education to a ladder, from the gutter to the university, for if the gates of that institution were opened too widely and entrance was made too easy, a similar result would happen to that now being experienced at the Sydney University, where, owing to the very large number of scholarships available, the building was crowded with students. The medical school alone had 1,000 students, probably the largest number in that branch of science in any university in the British Empire. This fact had been adversely commented on, and the question was asked very pertinently what would be the probable result of such a disproportionate number of medical students to the population of the State. The professor said he rather preferred to compare education to a tree, the primary system being the trunk, with the upper branches well stored with nuts waiting to be picked by those who took the trouble to gather them. Some would gather from the top, but many more could find quite as rich fruit on the side branches, while those who had no ambition or desire or ability to climb, could still gather some nuts on the ground beneath. (Applause.) The aim of the university was to enable its graduates to carry out their duties in the most efficient manner as citizens of the State, and to instil into them a desire to discover some of the wonderful potentialities of this marvellous country so rich in hidden treasures of the flora, fauna, and soil. The work of the School of Mines and Industries and allied institutions in various country centres was mentioned, and the earnest hope expressed that in the near future some measure would be passed by Parliament to compel boys and girls from the age of 14 years to 16 or 17 years to come under a system of training which would tend to inculcate a knowledge of subjects beyond the scope of the primary school curriculum. This would better fit them for the great duties of life, and prevent to a large extent, that deplorable loss of valuable time and energy, to say nothing of the bad habits now so noticeable among the young people who would not voluntarily spend their leisure time profitably.

In answer to a question, the professor said he saw little difficulty in carrying out the idea of compulsory advanced studies if a register were kept of all children who left the primary and similar private schools. The Act of Parliament compelling all apprentices to spend a specified time, partly out of their employers' time and partly from their own, had proved a great success. The returns compiled each quarter assured regular attendance.

### BRITISH SCIENCE ASSOCIATION.

#### A MUNIFICENT GIFT.

LONDON, September 7.  
At the meeting of the British Association for the Advancement of Science at Hull it was announced that Sir Charles Parsons, the President in 1919, had given £10,000 for the general purposes of the meeting of the association at Liverpool next year. Sir Ernest Rutherford, F.R.S., who has been appointed incoming President, will be one of the youngest men ever elected to that position. Professor W. L. Bragg read a paper on the significance of the crystal analysis. His father, Sir William H. Bragg, spoke on the crystalline structure of organic compounds.

The Braggs, father and son, were formerly of the Adelaide University. Professor W. L. Bragg succeeded Sir Ernest Rutherford as Professor of Physics at the Manchester University. He gained the Nobel Prize, and rendered notable service to the Empire in the war. Sir Ernest Rutherford is 51 years of age, and he also is a Nobel prizeman.