

"ANCIENT HUNTERS."

OUR EARLIEST ANCESTORS.

THE BIRTH OF ART.

LECTURE BY PROFESSOR SOLLAS.

Despite the great counter-attraction afforded by the Mayor's Patriotic Concert at the Exhibition Building on Tuesday evening, there was a large attendance at the Town Hall to hear a lecture entitled "Ancient hunters" by Professor W. J. Sollas, Sc.D., LL.D., Ph.D., F.R.S. (vice-president of section C of the British Association), and professor of geology in the University of Oxford. Sir Oliver Lodge presided, and, in introducing the lecturer, said he was a man of great and varied accomplishments and superabundant energy.

Professor Sollas said he proposed to invite their attention to a very remote past, before the ages of coal, iron, bronze, and copper, and flint. For the past 6,000 years man had been dependent on the farmer and shepherd. Going another 1,000 years back there were no farmers or shepherds, and man lived on the wild fruits of nature. That was the age of the ancient hunters. During that 7,000 years the climate had undergone very little change. But during the period of the ancient hunters, it was at one time warmer and then colder, and all the world was affected by a lowering of the temperature by about 9 deg. Fahrenheit. A



Professor Sollas.

large part of Europe and North America were covered with ice and snow. The British Isles were like Greenland now, and even Australia was affected, as Professor David had shown, and glaciers descended the slopes of Mount Kosciusko. Waves of heat and cold were repeated several times in the glacial epoch.

Earliest Man.

It was in the last episode of that epoch that man seemed to have made his appearance in Europe, and perhaps on the globe. The remains of such a primitive man had been found at Piltdown, in Sussex. They were very remarkable. The skull was a human one, and it held a human brain. But the jaw was of a very different character. It more resembled the jaw of an ape than of a man, and it was provided with dog teeth more like those of an ape. The jaw was remarkably like the jaw of a chimpanzee. When they reflected, it was very much as they should expect. All naturalists were now agreed that man was created by evolution from the ape. The predominant factor in that evolution was the growth of the intellect and the corresponding growth of the brain. But what could man, however clever, do without weapons? The earliest weapon was a long stick sharpened by means of a flint. In the course of time, as weapons and implements came into use, the teeth of man grew smaller, the ape faded away, and in the human face at last emerged the image of the human soul. (Applause.)

In a cave that had been discovered in France a human skeleton had been found lying towards the east. Over the jaw were the leg bones of a bison, which showed that when the body was laid in the ground some animal flesh was placed over the mouth of the deceased to sustain the soul in its wanderings in the unknown regions. Therefore in that early history of the human race man had already conceived a life beyond the grave. He might have believed in the survival of the soul, although he might not have believed that it was immortal. (Applause.)

The Birth of Art.

They passed from that stage of man to another known as the Aurignacian, named after the discovery of remains at Aurignac, in France. The Aurignacians invented the bow and arrow. Consequently they did not have to work so hard to live, and had some leisure. As a result the birth of the fine arts was witnessed. The discovery of paintings on the walls of caves was made by a Spanish nobleman about 40 years ago. The mastery of technique was perfect in those paintings, and it was difficult to see how anyone could have done better with the materials. It was surprising that primitive man should have achieved such excellence, which rivalled some of the paintings of early Greece. The paintings had given rise to many speculations, but the custom was very intelligible. The scenes which the hunters painted were those which appealed to them. It was the love they had for the world around them which led them to repeat the scenes that pleased them most. (Applause.)

The Red Hand.

The red hand had been found in caves all over the world. In Australia they know how it was made. The native daubed his hand with ochre and stamped the impress on the wall of the cave. The stamping of the red hand was associated with another custom, that of the mutilation of the hand as a propitiatory sacrifice, but later it was supposed that the mutilations were not really made, but only represented. There were paintings in the caves of Australia, but they were only remotely connected with the others.

Another World to Conquer.

Throughout the whole of that long story man had been a progressive being. He had made great discoveries in the past, as great in their way as any discovery of modern times. But he made them less frequently. Now, through investigation, discoveries were made apace, and man had mastered the outer world. But there still remained a world to conquer. It was the inner world, the world of mind. Here was room for great adventures. Here man's greatest triumphs still awaited him. When man had achieved the dominion of mind, then for the first time he would have entered into full possession of the glorious inheritance that was his. (Applause.)

Dr. Verco, president of the Royal Society of South Australia, in proposing a vote of thanks, said the visit of the British Association would do a great deal of good.

Dr. Haddon, reader in ethnology in the University of Cambridge, in seconding, urged that every effort should be made in Australasia and elsewhere to gather all the possible information regarding ethnology, as there was no branch of science in which the data were disappearing so quickly.

Sir Oliver Lodge, in putting the motion, said they had realised by the lecture how early in the human history was art compared with science. Science was an affair of yesterday; art began in the long, dim, and distant past.

Professor Sollas, responding to the vote, which was carried with acclamation, emphasised the remarks of Dr. Haddon.

The lecture was illustrated by numerous slides.

Angaston and District Visited.

Entertained by Mr. Charles Angas.

The first all-day excursion in connection with the British Association's South Australian session took place on Monday. The picturesque district of Angaston had the distinction of a visit from a large body of eminent scientists, and their Adelaide hosts and friends, a party numbering altogether more than 200. A special train left Adelaide at 10 a.m. and reached Angaston at about noon. A few members of the party left the train at Seppelts, and were motored to Seppeltsfield, where they lunched, and viewed the wine cellars at the invitation of Messrs. B. Seppelt and Sons.

The main party was entertained at the hall at Angaston by Mr. Charles Angas. The host presided, and a sumptuous lunch was served. A necessarily brief toast list followed. His Excellency the Governor was to have been one of the speakers, but was unable to be present. The absence of the Commissioner of Public Works (Sir Richard Butler) and the President-elect of the Association (Professor Bateson) made it necessary to further alter the toast list.

"The King" was enthusiastically honoured, the National Anthem and three cheers imparting the essential British tone to the drinking of the toast.

—The Visiting Members.—

The Minister for External Affairs (Mr. Glynn) proposed "The visiting members of the British Association." He said that the coming of the association to Australia was an event as rare as it was significant. It ranked with those happenings from which historians took their bearings, and those events which marked the close of one period and the opening of another. The conditions of affairs in Europe showed that it would be a long time before the establishment of that reign of peace on earth which science tended to precipitate. One was almost led to think that the hands had been put back upon the dial of time. At all events there was some compensation in the thought that Britain did not seek the war. (Applause.) He had in his hand a communication in reference to an Imperial matter which reached him by the last mail from England. It contained an estimate of the man who was now maintaining the highest traditions of British diplomacy, Sir Edward Grey. (Applause.) Speaking at a deputation in reference to a matter having some direct reference to Australia, this great statesman said, "I always feel we should aim less at measuring ourselves and our actions with other nations, and aim more at the performance of our own high conceptions of our duty." (Applause.) It was not for him to speak of science except "with bated breath and whispering humbleness," but he could assure their kinsmen and friends of the heartiness of Australia's welcome—and they were kinsmen and friends, to whatever race or country they belonged, because they were joined together in science. (Applause.) He asked them to pity the plight of a poor politician, fresh from an endeavour on the platform to make fiction pass for truth—(laughter)—and finding himself in a gathering in which philosophy and truth reigned supreme. Welcome to the shores of Australia, members of the British Association, whose aim it seemed to be to devote rare intellect and great industry to the production and investigation of the loftiest of human needs! (Applause.)

—Sir Oliver Lodge's Reply.—

The President, Sir Oliver Lodge, responded to the toast on behalf of the visiting scientists, and expressed appreciation of the welcome and warmth of good fellowship which they had encountered at the hands of "their kinsmen beyond the seas." They felt admiration, too, for the beautiful City of Adelaide and for the surrounding country. He was told Adelaide was a very attractive place, but the half of it he now saw was not told him. The cities of Australia were setting an example in their preservation of open spaces, and when these cities grew to enormous magnitude their inhabitants would be grateful to those who had preserved parks and pleasure grounds. There was not only the beauty to consider but the bracing air. The visitors were told that rain was wanted in South Australia, but those who came from the British Islands were glad of the sunshine. He hoped it would rain directly they had gone. (Laughter.) People were inclined to forget the beauty of the world in which they lived, and to fail in truly understanding the joy of

existence. He sometimes felt that himself. The animal and vegetable world rejoiced in its existence, and man must learn to do that, too. He noticed from Mr. Glynn's mode of speech that he was an Irishman—(laughter)—and he could not sit down without a reference to the magnificent attitude of the Irish in the present crisis. (Applause.)

—A Danger of Big Cities.—

Sir Harry R. Reichel, the Principal of University College, Bangor, North Wales, proposed 'Mr. and Mrs. Charles Angas.' He said the first thing which struck the visitor to Australia was the enormous, and, if he might say it without offence, the disproportionate size of the principal cities. It seemed to be a twentieth century impression that civilized life was really only possible in cities; but he doubted whether the highest form of city life was really possible unless it were based upon an adequate rural community. Australian cities were, of course, in pleasing contrast to the great aggregations of houses which were called cities in England; but he thought they might prove a problem to the statesmen who strove for a free, white Australia.

The toast was accorded musical honours, and Mr. Angas briefly expressed his thanks.

—Return Journey.—

After lunch the visitors were motored to Lindsay Park and round the district generally, a fleet of motor cars having been placed at their disposal. But there was not much time to spare before the beginning of the return trip. The train started away again shortly after half-past 2, and a halt was made at Tanunda half an hour later. Here the works of the Chateau Tanunda Company were inspected and afternoon tea was served by the courtesy of the company at the town hall. The President expressed the thanks of the party to the Chateau Tanunda Company, and also voiced appreciation of the kindness of Messrs. Seppelt and Sons on behalf of the smaller party who rejoined the train at Seppeltsfield at 2.45. Tanunda was left punctually at 4.20, and the "special" rolled into the Adelaide Station again at exactly the prearranged time—5.50.

OTHER EXCURSIONS.

During Monday other excursions of interest to individual sections took place. There was a botanical trip to the hills, and an anthropological outing to Milang, and a two-days' geological excursion commenced.

"THE ETHER OF SPACE."

AN ALL-IMPORTANT BODY.

The first of the lectures in Adelaide by members of the association was delivered by Sir Oliver Lodge (President) at the Town Hall last night. There was a very large audience, which included the oversea visitors, members of local professions and educational institutions, and prominent citizens. The subject was "The ether of space." His Excellency the Governor (Sir Henry Galway), who presided, introduced the distinguished speaker in happy vein.

—Most Continuous Body.—

Sir Oliver Lodge was accorded an ovation. He said if there was one subject of less local significance than another it was ether of space, which was everywhere, and was the longest and most continuous body. Its function was to unify the cosmos. It extended to every and the furthest star. If not they would not be able to see the stars. Ether was the medium of the vibrations of light. If light started from the sun it would take eight minutes to reach the earth. In that time it rippled through the medium which Sir Isaac Newton was one of the first to call ether. (Hear, hear.) The speed with which light waves travelled had been measured with great accuracy. It would take much less time than a second to go from Australia to England. Ether had finite properties, which could be measured and determined. It was owing to its uniformity that they found the same laws existing throughout the universe. (Applause.)

—Matter and Ether.—

What was the difference between ether and matter? The latter was something that could be moved by the action of human muscles or force. That represented their whole power in the material universe. They thought they could make electricity and grow grain. But they were only agents to bring together the influences which did that for them. (Hear, hear.) Ether was the most stationary body in existence. They could not move it. His doctrine was that they could strain it, put it out of shape, or contort it; but it had elastic properties, and would try to recover itself and spring back into its former shape. The whole activities of the material universe were alternation between two forms of energy constantly alternating from the elastic energy of ether to the moving energy of matter. Was ether a subtle and elusive form of matter and did it belong to the same form as matter? Ether was material in the sense that it belonged to the material universe and not the mental or spiritual or other aspects; but it was not matter. Particles of matter were separated from each other in the mass and held together by cohesion, and ether was that binding element of force or cohesion, but it is probable (although that ground was now being studied) that ether was ether. Lord Kelvin had said they knew more about ether than matter. How did they say the atoms of matter were composed of ether and yet ether was not matter? The latter was not a continuous body in continuous ether. If they tied knots in a string, they would say it was knotted, but it would still be a string with spaces between them. He would compare that to ether and matter. (Applause.)

—No Friction.

When a wave travelled over the water it was the wave that moved, and when matter moved it was not the ether that did so. The matter moved smoothly, and not as a foreign body; it moved like ice on water, not disturbing it. There was no friction between matter and ether, and the planets moved through it without any loss of energy. His experiments had proved that point. (Hear, hear.) Ether could be excited by electrical action, but no experiment which they had yet been able to make had enabled them to definitely ascertain ethereal properties. I must have elasticity and density, but they did not know at present what its properties were; and all they did know was that it connected particles of matter together. It might explain electrical and magnetic attraction, cohesion, and gravitation. Newton did not explain gravitation, and while they might discover what it was in the next 50 years, they had now hardly a clue to that end. (Applause.)

—The Densest Body.—

Ether was a million times more dense than gold or platinum; it was the densest body. They could not realize that at present, because it eluded their senses of materialism. If a mirror were free of dust and perfectly clean, it would be transparent, and they would not be able to see it. To their senses matter was all important. Their senses were imperfect, differences, in order to respond. If a deep-sea fish could reason it would be able to see the stones, rocks, and seaweed, but would not be able to appreciate the existence of water, because it was so perfectly and uniformly surrounded by it. That was the position of themselves in the ether. (Applause.)

—Much to Discover.—

Their senses were limited, and there was yet much to be discovered by them. It would be a great mistake to believe that things did not really exist because they did not know them at present. (Hear, hear.) They had no perception of the fullness of existence and the value of life. They were conscious of the process of development, and could help or hinder in the work. The greatest things were not those which they could most easily comprehend. The realm of science was infinite, and could never be exhausted. (Hear, hear.) They would always recognise the greatness of their ignorance and the immensity of the region beyond their knowledge. In the words of Newton:—

Lo, these are paths of His ways,
But how little a portion is known of them;
The thunder of His power who can understand?

(Prolonged applause.)

—An Intellectual Treat.—

Professor Stirling moved, and Professor David seconded, a vote of thanks to Sir Oliver Lodge for his "very informative and interesting address, which had been a charming scientific and intellectual treat."

The motion was carried by acclamation. The singing of "God save the King" terminated a memorable gathering.

—"Ancient Hunters."—

Professor W. J. Solas will this evening speak upon "Ancient Hunters." The public will be admitted free.

LECTURE ON EDUCATION.

As announced in our advertisement columns, Professor J. J. Findlay, Professor of Education in the University of Manchester, will deliver a lecture on Education in the Prince of Wales Theatre at the Adelaide University on Wednesday afternoon. The lecture is open to the public.

this far-off land in which to hold its assembly. Australians recognised that the association represented the very flower of twentieth century civilisation, and the highest point to which culture and research had carried the human mind. The labors of their visitors in the field of science had not only raised them—their names were almost household words—to positions of envied pre-eminence, each in his own domain, but they must all feel a joyful satisfaction in knowing that with the scientists' ascent to such lofty heights the name and fame of their common country and race had been lifted as well. (Applause.) They had arrived here in the course of their peaceful pursuits in the midst of great disturbance and anxiety of the public mind, when thoughts of the stirring events that were now taking place in the dear old mother country were causing deep emotion to swell within them as to the safety and happiness of the dear ones whom they had left behind in "the little grey home of the west." But they would be comforted by the thought that they had Australia's deepest sympathy, and, further, by the assurance that they were surrounded by people who were just a little more British than the English themselves, if that were possible. (Applause.) They would find Australians were equally concerned with respect to the security of the Empire; and they would see abundant manifestations on every hand of the deep and abounding loyalty and devotion of Australians to the person and throne of their beloved King. (Applause.) In that England was at war, Australia was at war, too, and they would rejoice in knowing that the full resources of the Commonwealth were at the disposal of the King in this terrible crisis. Their visitors, who had gained their laurels and renown as victors and conquerors in the fair fields of peace, would hopefully contemplate that happy time when war should be no more, and "when universal peace shall lie like a shaft of light athwart the land." Australia shared with them that great hope and aspiration of the human race. (Applause.) The greatest pleasure they could wish for their visitors was that even while they were in this country, which, happily, had never felt the rude shocks of war, they might be able to join in thanksgiving for the restoration of peace to the Empire and to the world. (Applause.)

Response by Sir Oliver Lodge.

Sir Oliver Lodge replied on behalf of the guests. He said he had been long connected with the association, and had, in fact, attended almost every meeting since 1873. He felt it a great honor to be the president of the association, but he also felt that he owed to it many opportunities, especially when he was a younger man, of being able to meet on terms of friendship men of far greater magnitude and far better known than he. Although the association was sometimes regarded as largely existing for social entertainments, its object was more to afford opportunities to workers in the various fields of science to get some personal knowledge of and acquaintance with each other. Concerning the financial question, he agreed with the Governor as to the advantage any nation might derive from being even a little bit extravagant in the maintenance of scientific investigation. (Applause.) There were a number of discoveries waiting to be made in medicine and many other subjects of considerable import to humanity, and although the men were ready for the work the means were often not forthcoming. It would be better to be a little extravagant rather than niggardly in matters of such moment. Scientific work was done quietly, and in seclusion, and prospered in times of peace. (Applause.) The progress of science in the 19th century had been largely due to the fact that the last hundred years had been, on the whole, a time of peace. But although their work was done in seclusion it was pleasant, he hoped wholesome, and, at any rate, invigorating, occasionally to come out in this more public manner and be recognised by those in high authority. They were grateful to the State Government for that reception, and especially to the two gentlemen who had been good enough to give them such a very hearty welcome. They had many lessons to learn from Australia, and one of them was Federation. They looked forward to the time when Federation would extend beyond this country—

When the war drums throb no longer,
And the battleflags are furled;
In the Parliament of man,
The Federation of the world.

—(Applause.)

Message from the Wattle Day League.

A message was forwarded to Sir Oliver Lodge at the reception at the Town Hall from Mr. W. J. Sowden, who, in his capacity of Federal president of the Australian Wattle Day League and president of the South Australian branch, stated that the members of the league desired to extend to him, as the official representative of the world-famous British Association, a most cordial greeting, and requested him to accept as an earnest of their goodwill an accompanying example of the beautiful golden wattle blossom which is the badge of the league and the national flower of Australia.

Patriotic Decorations.

The decorations of the interior of the Adelaide Town Hall, besides being pleasing from an aesthetic point of view, had a special significance in that they fostered the patriotic sentiment. Two bays on the left-hand side of the northern escape door were reserved and a dais erected therein for the accommodation of the Viceregal and Ministerial party. The large life-size oil paintings of the King and Queen recently presented to the State by their Majesties were hung behind the dais, one in each recess, crowned with laurel. Underneath each picture the Royal Standard adorned the walls with the Royal arms, fully emblazoned, between them. The two Royal chairs, which were specially made for their Majesties and occupied by them when they visited Adelaide as Duke and Duchess of Cornwall were removed from Government House for the occasion and placed upon the dais. The hall was freely adorned with Union Jacks, white ensigns, red ensigns, the Commonwealth flag, St. George's flag, and Royal Standards. In the recesses on the south side of the hall were placed pictures of the late King Edward VII. and the Queen Mother, H.M.S. Victory (Nelson's flagship), Lord Kitchener, the late Mr. Joseph Chamberlain, Sir Day Bosanquet, and the Parliament Houses at Westminster. Laurel wreaths were placed over the photographs of the Victory, the late King Edward, and Queen Alexandra. Mrs. Fairweather and the young lady teachers from the Norwood infant schools (who are members of the League of the Empire) volunteered to carry out the lavish decorations with wattle. Wattle blossom was sent in from the National Park and the West-terrace Cemetery and by Lady Symon, the railway stationmaster at Bridgewater, and other contributors. The scheme adopted was to tie the wattle into bosquets with red, white, and blue ribbon and decorate every ledge and column of the hall. The result was admitted to be particularly effective.

MEETING OF THE COUNCIL.

At a special meeting of the council of the British Association, held in the University of Adelaide on Saturday afternoon, the president (Sir Oliver Lodge) presided. It was unanimously resolved that a communication be sent to the Federal council, expressing the desire of the members of the British Association to recognise in every way the special difficulties which may attend some of the arrangements made for the meeting, owing to the unforeseen situation in Europe, and their willingness to acquiesce in the withdrawal of any item from the programme which might seem inappropriate in the circumstances.

A reply was at once received from the chairman and official representatives of the Federal council and the local executives, informing the council that while appreciating the thoughtfulness exhibited by the resolution, they felt strongly that the scientific and other business of the meeting should go on as it would have done under happier circumstances, but that some of the social functions might have to be modified in such a way as to meet the general feeling, and, moreover, if any difficulties of transport or other matters should interfere with, or modify, or delay any of the excursions, they were glad to know that the council realised the possibility of such difficulties, and would make the needful allowances.

The following telegram was received by the president from his Excellency the Governor-General (Sir R. Munro Ferguson), and was read to the meeting:—"I heartily welcome you and the members of the British Association to Australia. I wish your arrival could have taken place in a less anxious time, but trust that in spite of the grave preoccupations of the moment your visit may be a happy one and fruitful in good results."

PARTY FOR PORT PIRIE AND BROKEN HILL.

On Saturday afternoon a party of delegates left Adelaide by the Port Pirie express on a visit to that town, Iron Knob, and Broken Hill. Mr. E. Lewis, of the Broken Hill Proprietary Company, acted as director of the tour. On Sunday

the party proceeded across the gulf to the Iron Knob iron deposits, and returned the same day. To-day they will inspect the smelting works at Port Pirie, and in the evening will take their departure for Broken Hill, where on Tuesday they will be the guests of the Mine Managers' Association, and will make an inspection of the mines. On Tuesday night the delegates will set out on their return to Adelaide, which will be reached on Wednesday morning. Among those who booked for the northern trip were Sir T. H. Halland, Professor Henry Bassett, Professor W. S. Boulton, Dr. F. D. Chattaway, Captain J. K. Davis, Dr. A. R. Derryhouse, Professor J. W. and Miss Gregory, Dr. A. Holt, Professor E. S. Moore, Professor G. T. Morgan, Professor A. Penck, Professor S. H. Reynolds, Dr. N. V. Sidgwick, and Messrs. G. W. Lamphugh and H. Tizard.

SUNDAY'S PROCEEDINGS.

Although no official arrangements had been made for Sunday in connection with the overseas visitors, they had plenty to engage their attention. At 2.30 a considerable number of visitors took advantage of the opportunity of viewing the city and suburbs by special tramcars. The route followed was to Henley Beach and back to Burnside. Other scientists visited the Public Library, Museum, and Art Gallery, and the Botanic and Zoological Gardens. At 3.30 a largely-attended special service was held at St. Peter's Cathedral. The Governor (Sir Henry Galway) was accompanied by Sir Oliver and Lady Lodge, the Hon. G. J. Mulholland (private secretary), and Miss Macaulay. The attendance also included the Mayor (Mr. A. A. Simpson) and several members of the City Council. The choir, clergy, members of the University in their academic robes, and numerous visiting scientists entered the Cathedral in procession singing the hymn, "O, worship the King," written by Sir R. Grant. The National Anthem was sung before the service was proceeded with and the Bishop of Adelaide (Dr. Nutter Thomas) delivered a discourse bearing on the importance of the visit of the British Association to Australia. A collection was taken for the Northern Bishopric Fund, and after the benediction the clergy and choir left the Cathedral during the singing of "From Thee all skill and science flow," composed by Charles Kingsley.

PROGRAMME FOR TO-DAY.

Arrangements have been made for excursions to Angaston and district to-day, and the party will be entertained at luncheon by Mr. Charles Angas. They will proceed to Tanunda by motor vehicles, and afternoon tea will be provided by the Chateau Tanunda Company. A contingent has been invited to visit Seppeltsfield, and they will be entertained at luncheon by Messrs. Seppelt & Co. A number of scientific excursions will be made into the hills, to Milang, Hallett's Cove, Inman Valley, and Sellick's Hill. In the evening Sir Oliver Lodge, the retiring president, will deliver an address, taking as his subject "The Ether of Space." His Excellency the Governor will preside.

PROFESSOR STIRLING.

Professor E. C. Stirling, C.M.G., has been associated with Professor Kerr Grant in arranging for the Adelaide sessions of the Science Association, and his organising ability has proved very valuable in correlating and preparing the thousand and one details necessary to ensure the success of the visit. Professor Stirling is a native of South Australia, having been born at Strathalbyn. He is the eldest son of the late Mr. Edward Stirling, formerly a member of the State Legislative Council. He was educated at St. Peter's College, under the headmastership of the late Archdeacon Farr, and subsequently travelled to Europe and continued his studies for 18 months in Germany and France. He matriculated at Trinity College, Cambridge, and there obtained the degree of Bachelor of Arts, with natural science honors, before he took up the study of medicine. Then he took the degrees of M.B., M.A., and M.D. Having meanwhile become a pupil at St. George's Hospital, London, he became, in due course, a member, and subsequently a fellow, by examination, of the Royal College of Surgeons, England. When he left London for South Australia he held the position of assistant surgeon at St. George's Hospital, having previously held

that of house surgeon. Soon after his return to his native State Dr. Stirling was appointed lecturer on physiology at the Adelaide University, and he held that position for 11 years. He was also made surgeon to the Adelaide Hospital and a member of the board of management. In 1884 he was elected to the House of Assembly for the district of North Adelaide, and brought forward the first Bill for extending the franchise to women. He was defeated at the next general elections, and has not since sought legislative honors. He was first president of the State Children's Council, and has held the positions of president of the South Australian branch of the British Medical Association, president of the Royal Society in South Australia, and president of the section of surgery at the Intercolonial Medical Congress in Melbourne in 1888. He has received a gold medal from the Queen Regent of Holland for services to art and science. He is the author of numerous scientific and medical papers, and has performed very valuable work for science in his researches concerning Australian fauna. Dr. Stirling resigned from the position of honorary director of the Museum last year, after having occupied it for eight years.

PROFESSOR KERR GRANT.

The secretary to the South Australian committee in connection with the meetings of the British Association is Professor Kerr Grant, of the University of Adelaide, and there have been few busier men in the city than he during the last few weeks, in which he has been giving attention to the thousand and one matters of detail necessary for the reception, accommodation, and comfort of the army of visitors, to enable them to see all that is most interesting in the State, both from the standpoint of science and that of the tourist, and to ensure the success of the various functions and meetings. Professor Grant has the Chair of Physics at the University. He is a Victorian, having been born at Bacchus Marsh in 1878. His father was a Scotchman, of literary and artistic tastes, and from him Professor Grant inherited a love for books; also an analytical and investigating mind, which have brought him to the fore in Australia. He attended the South Melbourne College, and from there went to the Melbourne University to study engineering. Upon discovering that his tastes were in the direction of pure science and mathematics particularly he dropped the study of engineering, and in 1900 graduated in the School of Mathematics. Subsequently he was appointed lecturer in mathematics and physics at the Ballarat School of Mines, and two years later passed on to Grinnell College, Melbourne.

University, to undertake similar duties there. In order to acquire further knowledge he went for a year's travel and studied chiefly at Gottingen University. On his return he was appointed lecturer in mathematics to the Melbourne University. Shortly afterwards he joined Professor Lyle in the department of physics, and a few years ago he came on to Adelaide as successor to Professor Bragg, on the latter's departure for the University of Leeds.

SOMETHING ABOUT RADIUM.

PROFESSOR RUTHERFORD'S OPINIONS.

One of the delegates in whom Australians will naturally take a deep interest is Professor Sir Ernest Rutherford, whose researches in radium won him the Nobel prize for chemistry in 1908, and who is a graduate of the Canterbury College, New Zealand.

Speaking of radium, the professor said that during the past few years there had been an increase in the amount of radium separated annually. "The greater part of the valuable substance now produced," he said, "is obtained by the Chemical Company of Pittsburg, in the United States, by using the low carnotite ores obtained from Colorado. That company is now producing about one gramme of radium per month. Next to America in the way of production come the State mines of Austria, and a certain amount of radium comes from mines in Australia and in Cornwall. I understand the carnotite areas in Australia produce about one gramme per year, but here, as in Colorado, the ores are low grade and the working costly."

What about the quality and price?

"The price of radium has remained fairly steady during the past year," he added, "but actually buyers are obtaining better value for their money on account of the institution of the national radium standard. All radium is now bought and sold on this standard, and in consequence, notwithstanding the fact that prices seem to

have increased, purchasers are really better off, because they get more quality."

Radium is mostly used in the hospitals?

"Yes. During the past few years there has been great demand for it for medical purposes, and now a large number of hospitals in Germany, England, and the United States are endeavoring to secure sufficient quantities for the treatment of their patients. In Germany during the past year large sums have been voted by the municipality for the purchase of radium and other radio-active substances. In England the largest supplies are in the hands of the Radium Institute, but a number of hospitals, including those in Manchester, Dublin, and Sheffield, have collected considerable sums of money in order to purchase supplies. At Manchester, for instance, we have collected over £10,000 with that object in view, and a sum of £20,000 is aimed at.

The cost is high?

"Yes. It has sometimes been said that the price of radium is out of proportion to the cost of separation. In some respects that is true, but if deposits of high grade ore were available for working, no doubt radium could be sold at a profit for a fraction of the present price. But considering the fact that the radium separated in America and Australia is obtained from low grade ores, and such a large amount of material has to be worked, the cost of separation is necessarily very high, and there is probably in the sale of radium no extensive margin of profit when low-grade ores are dealt with.

"When I visited the United States recently," said the professor, "I heard a great deal about proposed legislation in regard to radium. A Bill had been brought before Parliament for the purpose of making all radium ore-bearing lands revert to the Government automatically. In that way it was hoped that a considerable quantity of the radium would be separated for the use of the United States, and that any surplus quantities would be exported. However, I have not heard whether the Bill was passed or not."

Are you likely to visit the mines in South Australia?

"I am afraid not, but I hope to see the works for the concentration of the substance when I get to Sydney. It is to be hoped that the mines in South Australia will prove profitable, but there is a strong market for radium, and still larger quantities than have been supplied in the past will be purchased in the future. Most of the radium now produced is absorbed by the medical profession, and, of course, a small amount is used scientifically in the University laboratories."

COUNTING THE STARS

Dr. F. W. Dyson, who has accompanied the overseas visitors, is the Astronomer Royal at the Greenwich Observatory, and he is a cousin of Mr. G. F. Dodwell, B.A. (Government Astronomer in South Australia), whose guest he is while in the State. The Greenwich Observatory is the most famous in the world, and in a brief chat Dr. Dyson gave some idea of the work being carried out there. "Our latest work," he said, "has been to measure the distance between the stars and to count them. Taking the measurements is a difficult and tedious job, but we have succeeded in being able to measure those that are not more than 400 million of miles apart. Beyond that distance we cannot go. The counting of the stars has been done in groups, according to their brightness. Photographs of the heavens were taken by an enthusiastic amateur observer—one in England of the Northern Hemisphere, and the other in South Africa of the Southern Hemisphere—and we worked from these photographs. We came to the conclusion that there are between 1,000,000,000 and 2,000,000,000 stars in the heavens.

"Then," added Dr. Dyson, "we carry on work usual at observatories, such as giving the correct time and checking chronometers for the navy. Every day the Paris time is checked with Greenwich by wireless, and it is never more than a quarter of a second wrong. The sun is photographed daily and the spots measured, and we make many magnetic observations. We find that the earth while moving round on its axis wobbles about a little. It is nothing serious," he concluded, "as the wobbling from the line is not more than 14 yards."

THE RECEPTION.

BRILLIANT FUNCTIONS.

The Town Hall presented a brilliant scene on Saturday evening, when the visitors were tendered a reception by the Ministry. The hall was gay with bunting and floral decorations, the national bloom—golden rattle—being largely utilised in the adornment, while on the platform palms were artistically arranged. On the dais in the north-eastern portion of the hall the Premier and members of the Ministry, with their ladies, and the Mayor and Mayoress of Adelaide, were stationed, and here the visitors were introduced from 8.30 to 9 o'clock. On the arrival of his Excellency the Governor and Lady Galway at 9 p.m., the party were met by the Chief Secretary (the Hon. J. G. Bice) and the Commissioner of Public Works (Sir Richard Butler) in the vestibule, and escorted to the platform. Outside the Town Hall, the front of which was brilliantly illuminated, a fanfare of bugles announced the arrival of his Excellency, and a guard of honor was formed by a contingent of mounted police. As the viceregal party entered the hall the city organist (Mr. W. R. Pybus) played the National Anthem, and the audience joined in singing the familiar strains. Three cheers followed, which were heartily joined in by the large assemblage.

Welcome by His Excellency.

His Excellency the Governor (Sir Henry Galway) in welcoming the visitors, said, in the name of the citizens of Adelaide, he was pleased to welcome such a distinguished delegation of the British Association. The name of the association was honored wherever science was pursued. They thought with pride of the foundation of the association 82 years ago on the initiative, he believed, of Sir David Brewster. It was then a small body, with a few sections, but it had now grown into a very large fellowship, presided over by a general president, and supported by 13 presidents of sections. It was pleasing to remember that the annual session of the British Association had several times been held in the colonies and Dominions, at Toronto, Montreal, and South Africa. He ventured to hope that their deliberations in this quarter of his Majesty's Dominions would be as fruitful as any before, and that they would take back with them to the motherland kind memories of the fellowship of citizens they were honoring by their presence. As they all knew, the Commonwealth Government had expressed satisfaction at their promised visit in the practical form of a subsidy—a method of appreciating science which was much to be commended. Pride in the triumphs of science was perhaps more legitimate than pride in any other form of human accomplishment. Peaceful conquerors of unknown realms, their readiness, their researches and investigations, their discoveries all proceeded quietly while the great material world went on its noisy way, little realising the value of all the persistent, painstaking work until it touched the practical affairs of daily life. One lesson which the visit of the British Association to Australia would bring home to the public mind was that scientific investigations were well paying for. The money used for the endowment of chairs of science in

of learning was an investment valuable beyond computation. When the association met at Birmingham last year many people in Australia who could not pretend to be even moderately acquainted with science, read with deep attention the report of Sir Oliver Lodge's presidential address which dealt with the continuity of natural phenomena. In Australia, as at home in England, the work of the association's eminent retiring president was a known force in the thought of the day, and they were grateful to find Sir Oliver Lodge was with them that evening. (Applause.) The newly elected president, too (Professor William Bateson), was well known to students here, as elsewhere, as the distinguished authority on heredity, while other gentlemen of equal eminence were with them. Before such a gathering of authorities in all departments of science a layman was easily led to discover his own ignorance, especially when he thought of the various sections there represented. Ignorance of science was, however, no bar to gratitude to men of science for their valuable and laborious work. (Applause.) He was but expressing the sentiment of every section of the community when he said that in welcoming the British Association to Adelaide he felt it was not only a very great pleasure, but an equally great privilege and honor. (Applause.) That the visit of the association should be clouded by the great crisis through which the Empire was passing was a matter of deep and universal regret. Their welcome to them, however, was none the less sincere, but it was no time for rejoicing. However confident they might feel in their hearts they must be humble and pray to God to strengthen the nation in the hour of her trial, so that the British Empire might emerge from the struggle with dignity, honor, and increased glory. (Applause.)

The Premier's Greeting.

The Premier said he had the greatest pleasure, on behalf of the Government and people of the State, in giving the distinguished visitors a most cordial and friendly welcome to South Australia. It was a great honor to Australia that the members of the illustrious British Science Association had chosen

The express which arrived from Melbourne on Saturday morning brought a large contingent of visitors from the eastern States to attend the gatherings in connection with the British Association. They included Professors E. Goldstein, J. J. Findley, and W. M. Davis, Drs. C. A. Rayne and L. J. Briggs, Messrs. C. G. Abbott, F. Sebenham, M. M. Alorge, J. Hesketh, H. J. G. Moseley, Watson, Mr. and Mrs. A. H. Evans, and Mr. and Mrs. Laurie. Professor David, of Sydney, and Professors Masson and Skeats, of Melbourne, came previously.

THE OPENING GATHERINGS.

The meetings in Australia of the British Association, which began on Saturday, will long be remembered as a striking feature in the intellectual history of the Commonwealth. Never before has such a distinguished body of men eminent in different branches of intellectual activity, but bound together by the tie of scholarship, met in this continent, and it is a tribute to the development of culture in so young a country that an official congress, so largely attended, of a scientific brotherhood, should make this its meeting place. Australia is quite conscious of the tribute paid her by the acceptance of the invitation to hold the gatherings this year in the different cities of the Commonwealth. Our visitors will have an opportunity while in Australia of seeing something of what has already been accomplished in the realm of the higher learning. Universities and technical schools have been established in Australia, and these, in their own degree, are exerting a real and beneficial influence on the intellectual life of the people. It is a fitting tribute to the visitors that the Adelaide University should confer degrees on several members of the party, as the ceremony will serve to illustrate the unity of knowledge. Science, like art, is a kingdom to itself, and the citizens of it belong to a common brotherhood. They may come from the uttermost parts of the earth and meet in council, but they recognise each other as members of one body whose business it is to enlarge the borders of human knowledge, to conduct research, and to arrange and collate the results of investigation.

SIR OLIVER LODGE AND THE WORKERS.

Sir Oliver Lodge, speaking at the large gathering under the auspices of the South Australian branch of the Workers' Educational Association on Sunday night, paid a testimony to the activity of the organization. He said he was particularly pleased to be upon its platform, for he was greatly interested in the movement in England. He was Chairman of the inaugural meeting. It was suggested then that it should be called the Working Men's Educational Association, but a woman in the audience cried out, "What of the women." He thereupon suggested that the name should be changed to "workers," so he had had a hand in the christening. (Laughter and applause.) The association had risen by reason of the demand of the working man to know more about the world in general—to obtain greater knowledge of humanity and the conditions which influenced it. They were asking for a higher education all round. That was only right and proper, and if they did not obtain it for themselves their children would. (Applause.) Only in that way could they hope to secure a higher standard of human comfort and happiness. By education opportunity was given to the soul to develop. (Applause.) He believed there was a wholesome poverty that injured nobody, but it was the grinding, degrading poverty, of which they had, alas, so much in England's great cities that was injurious to the soul. (Applause.) It was not the creature comforts alone that they desired. They themselves were of far more value. Their character was their own property. That was what they could save in a permanent sense. There were things they did not take with them; but their characters determined their destiny. (Applause.) The workers in this country had a great deal of power, and, therefore, a great deal of responsibility. They must have knowledge if they were to rule the land wisely. They had been thinking of the problems of saving and spending. It might be said that they were mainly concerned about the earning of money, rather than the spending of it. Their wives spent it for them. (Laughter.) The various communities were now considering more than ever the question of spending, and it was a very hopeful sign. Humanity was acquiring a greater power to direct its own destinies to a remarkable extent. The development of Australia on the right lines would be more than useful to those directly concerned. It would stand as an example for the older countries, so that they might follow. They would be doing a work in these untrammelled and free conditions which, he hoped, might be felt throughout the whole of the civilized world. (Applause.)

THE ETHER OF SPACE.

A PROBLEM IN SOLUTION.

INFINITE REALM FOR RESEARCH.

LECTURE BY SIR OLIVER LODGE.

A crowd, filling every part of the Town Hall, assembled on Monday evening to hear the address delivered by Sir Oliver Lodge (president of the British Association for the Advancement of Science), on the "Ether of Space." His Excellency the Governor (Sir Henry Galway) presided, and, in introducing the lecturer, described him as the distinguished, popular, and learned principal of Birmingham University. (Cheers.) His Excellency said that to an unscientific man the subject of the lecture rather made one tread warily, but Sir Oliver had the ability and reputation of being able to put it in simple and illuminating words, so that all could understand. (Cheers.) Sir Oliver Lodge was accorded a remarkable reception, and, during the course of his lecture, he was listened to with rapt attention.

A Vast Conception.

Sir Oliver Lodge said:—If there is one subject of less local significance than another it is the ether of space, for it is the same not only here and at the antipodes but on every planet, at every star, and in



Sir Oliver Lodge.

the spaces between the stars. It permeates the universe; it extends to the farthest bounds of the visible cosmos, and it permeates not only what we call empty space, but full space also. It interpenetrates between the atoms of matter. Whether that matter be transparent or opaque the atoms are bathed in ether. It is ether which unites them. It is the largest body of which we have any knowledge. It is the most continuous, and its function is to weld the otherwise scattered particles into a cosmos, to unify them into the universe. If matter could exist without the ether, which is doubtful, it would exist in isolated lumps, or, indeed, isolated particles having no connection with each other. They are welded and unified together with the connecting and universal medium, the ether of space. If ether did not extend to the farthest star we should not be able to see the stars, for it is the ether which is the vehicle of light. It is light-bearing; it used to be called the luminiferous ether. Light consists of vibrations. Those vibrations must be vibrations of something. They cannot be vibrations of matter, for no matter could transmit them at the rate at which they go, and yet they must be existing somewhere. If light started from the sun now it would take eight minutes to reach the earth. In those eight minutes where is it? It is in the intervening space travelling at a great rate, rippling like a sort of tremor through a medium which is competent to convey it, a medium which Sir Isaac Newton called by the name of ether. It might be said that the ether was so intangible a substance, so perfect, so continuous that its properties were infinite. It might have transmitted light, or, at any rate, we might have imagined that it transmitted light, at an infinite pace. If it did it would have been truly beyond our ken. But it transmits light at a finite pace.

The Properties of Ether.

The ether has very remarkable properties if it can transmit waves, tremors, pulsations, at the rate at which light is transmitted. That rate has been measured with great accuracy, and the ether has thereby given itself away. (Laughter.) It has proved itself to have finite properties which we can investigate and determine. It has many other properties. I have only mentioned one because that has longest been known, and is simple and easy to understand. But it is owing to the uniformity of the ether that we find the same laws existing throughout the universe, by which I mean that the material means of executing those laws is the ether. We find that the atoms of the distant stars are vibrating in the same way, and that the stars are composed of the same chemical elements, showing that the universe is one, that it is, as we may imagine, dominated by one idea—one mind runs through it all. (Applause.)

The Relation Between Matter and Ether.

I go on to ask what is the relation between matter and ether. Matter is that with which we are familiar; the ether is to most people comparatively unknown. Matter may be defined as that which we can move. Movement is the characteristic of matter. If matter is that which moves, what about ether? My belief is that ether is the most stationary body in existence. We cannot move it. Can we do anything with it? My doctrine is that we can strain it. It possesses elastic properties, and can be distorted and put out of shape and it will recover. If you take a piece of steel and bend it you are not really straining matter; you are moving it. You are altering the positions of the particles of the configuration of atoms. Ether is the connecting substance that is strained, and that makes the steel spring back again. Matter moves; ether is strained. Matter has kinetic energy; ether has potential or static energy; and the whole activities of the material universe are alterations between these two forms of energy. The question that arises, if these two things are so closely related, always acting upon each other, and always interchanging, is whether or not ether is material and a form of matter, a subtle and elusive form, but yet belonging to the same category as matter. The answer I would give to that is that ether is material in the sense that it belongs to the material universe, as distinguished from the mental or spiritual universe, but it is not matter. Particles of matter, even in the midst of a solid body, are separated by interstices. It is ether which holds them together. We can snap them apart, or break their continuity, but until we do that they are held together by the force of cohesion. Here I am trenching on ground not yet fully cultivated—a ground upon which many people are now working. It is probable that matter is composed of ether. Ether seems the more fundamental thing. It seemed so to the late Lord Kelvin, who said we really knew more about ether than we knew about matter. How can we imagine atoms of matter composed of a medium and yet say that medium itself is not matter?

How Matter Moves.

Suppose we take a piece of string and tie it into knots. We would say the string was a uniform, continuous medium, on which there were so many knots. In the same way I would liken the knots to the atoms of matter and the string to the ether, the continuous connecting medium. You might take in the same way a wave. The wave is composed of water, and yet it is a peculiar part of the water, an individualised part, and a part that moves. That also is true in the case of ether and matter. Matter does not move through the ether like a foreign body, as a ship does through water. It moves through the ether as a piece of ice might do through water, being of one substance with it. I believe that is the way in which atoms of matter move through the ether. They do not disturb it; they are not foreign bodies in it. You may say the movement is slow, because the movement of ice through water is slow, but how in the case of vapor through water? That is another form of movement and much more rapid. (Applause.) Now, one fact about this kind of motion is that there is no re

friction between ether and matter. The planets move through the ether without any disturbance or waste of energy. It would be difficult to say what would happen to the energy if it had to be left behind. It is sometimes supposed that it is left behind in the form of heat, but heat is a thing belonging to matter only, and not to ether at all.

Interesting Experiments.

I have aimed, by many experiments, at finding out whether there is any friction between ether and matter, and the results are published in Royal Society papers between 1833 and 1897. I took steel discs, like circular saws, and whirled them at a great pace, expending nine horsepower in spinning them. I spun them until they were ready to burst by centrifugal force; and over these discs I had a beam of light reflected by mirrors round and round in such a way that one half of the light was sent round the discs with the motion, and the other half against the motion. Then I caused the beams to reunite, to see whether one had been expedited and the other retarded. If there had been the least friction the light that travelled with the discs would have been accelerated and the other retarded. If it had been but the thousandth part of an inch the experiment would have shown it, but the more carefully the experiment was made the less was the outstanding result, till one could say there was no outstanding result up to the limits of possible observation. (Applause.) Now, speaking to the physicists present, in one page of the transactions in 1897 I pointed out that if the experiments were reversed so that you span the mirrors and the discs on a sort of turntable, there must be a result. I did not put myself on the turntable to make this experiment. (Laughter.) I believe I ought to have done so, but it would have made me very giddy—(laughter)—and the experiment would have been cumbersome and costly. A learned Frenchman, however, has since performed this converse experiment, and the result has been very interesting. In that experiment he said he had proved the existence of ether. In that I am unable to agree with him. He proves no more than the other experiments had proved, but proves it in a more striking way. What he proved definitely is that the velocity of light does not depend on what you do to its source. It is very difficult to prove any fundamental thing. Many other attempts to get hold of ether and make experiments on it have all resulted in negation. We are unable to grip it. There is no friction. I won't say there is no connection between matter and ether. There is, but there is not the action with which we know how to deal. The ether is perturbed by electrified matter.

Ethereal Properties.

No experiments which have yet been made have enabled us definitely to ascertain ethereal properties. We can measure the velocity of light, but very little else. Ether must have an elasticity and density, but we do not know yet what they are. It must in the long run explain electrical attraction, magnetic attraction, cohesion, and gravitation. The childish experiment, so to speak, of a magnet attracting a sewing needle is, when you come to think of it, very remarkable. We are familiar with the fact, but we do not by any means fully understand it. We are familiar with the fact that an apple falls to the ground, but we do not really know why. The most simple experiments are the most difficult of explanation. Gravitation has not yet been unravelled. What Newton did was to apply the fact of gravitation to astronomy and unravel astronomy by its aid. But he did not explain gravitation. He knew perfectly well he did not. He left it to future generations to explain why the sun attracts the planets and how it was achieved. (Applause.) He thought it must be through an ether, but he did not say exactly how it was done. Subsequent generations have not yet solved it. It remains one of the problems which are being attacked. It may be that within the next 50 years it will be to some extent solved. At present we have hardly a clue to the nature of gravitation. This electrical theory of matter, the view that the particles of matter are charged with electrons of electrified matter, is one that is growing in conviction, but it is not by any means fully substantiated.

The Density of Ether.

It used to be thought that ether was a very subtle, tenuous, rarefied thing, hardly mentionable in the presence of matter. The doctrine of the future may be—my doctrine in the present is—that if matter is composed of ether, the ether must at least be as dense as matter, and, taking all the facts into account, I say that it is millions of times denser. The densest matter we know is gold and platinum. I say ether is a million times denser than those. It is a substantial medium in which matter is, as it were, a kind of accident, a modification. Matter is here a little bit and there a little bit, separated by great spaces as compared with the size of the particles even in a solid body. It is like a Milky Way, and like gossamer. It is matter which is rarefied and slight, it is

ether which is really substantial and dense. An inversion of our ancient ideas is taking place, and I regard that inversion as very important. (Applause.) It seems strange that we cannot hold ether—that it is intangible; but that is entirely because of the limitation of our senses. Through our senses we interpret the universe, and anything that does not appeal to our senses is for the most part unknown. To our senses, matter is all-important. Other aspects that might be equally real elude us. Anything that is extremely perfect and extremely uniform is apt to elude our senses. Even a mirror on a wall, if it is quite perfect and has no dust on its surface, is invisible. It makes no impression on the senses. Imperfection and change are what we can appreciate. Our senses require differences and contrasts in order to respond. The uniform thing is inaccessible. The fact I want to emphasize is that ether is intangible and yet real. And I will emphasize it by a parable. (Applause.)

What a Parable Taught.

Imagine a deep-sea fish, intelligent enough to be able to think about its surroundings. What would it know? It would be aware of other fish; it might be aware of seaweed and of accidents or happenings in its vicinity; but the last thing it could discover would be water. The deep-sea fish would be unable to perceive the presence of water, although completely immersed and surrounded in it. It would be surrounded in it so uniformly and so perfectly that it would know nothing about it. That is our position in the ether. (Applause.) Our senses are no test of reality. They are limited. With the aid of all our instruments—telescopes, stereoscopes, and so on—we have gone a little beyond ordinary knowledge into the unseen and the super-sensual; but we have gone a very little way only, and there is much more yet to be discovered. Our senses have already given us an appreciation of beauty, and of law and order; but it would be a great mistake to suppose that anything to which our senses do not respond is therefore non-existent. The fact that we cannot perceive a thing by ordinary physical investigation leaves us exactly where we were. (Applause.)

Inconceivable Magnitude and Complexity.

The magnitude and complexity of the universe are beyond our knowledge, and beyond our conception. We have at present, I believe, no comprehension of the fullness of existence or the value of life. We have developed consciousness and free will far beyond reach of physics. The greatest things are those we cannot comprehend. (Applause.) Science is aiming at going further and further, and will go further and further. But its realm is infinite, and we shall not exhaust it. Gradually the human race will get to know more and more, and we shall feel the greatness of our ignorance and the immensity of the region beyond our knowledge. (Applause.) I will conclude with words which emphasize that aspect of things, words akin to those that Newton used at the end of his long and immensely successful life in investigating nature. He had realised how small a part it was that he and the generation in which he lived knew. "Lo, these are parts of His way, and how little a portion is heard of Him. The thunder of His power who can understand?" (Loud applause.)

On the motion of Professor Stirling, of Adelaide, seconded by Professor David, of Sydney, an enthusiastic vote of thanks was accorded the lecturer.

THE CONGRESS OF SCIENCE

ARRIVAL OF THE GREAT OVERSEAS CONTINGENT

SPECIAL HONORS CONFERRED BY ADELAIDE UNIVERSITY.

Scientists, old and young and short and tall, arrived in Adelaide on Saturday morning. It was a great day for learning; it was a great day for the city. For the first time the travelling Congress of Science came to Adelaide. Never before has Australia been visited by such a gathering of distinguished members of the British Association for the Advancement of Science.

Several members of the great party from overseas arrived during last week, but the main contingent came by the Orvieta on Saturday.

This latter body, numbering about 150 in all, reached the city at 30 minutes after noon. The train from the Outer Harbor was met by several of Adelaide's leading citizens, among whom were Professor E. C. Stirling (chairman) and Professor Kerr Grant (secretary of the South Australian Committee). The travellers were directed to the northern exit from the station, where all available road space was occupied by motor cars and other vehicles waiting to receive the visitors to convey them to various places of residence. A party from the university assisted the visitors, and, as a result of systematic arrangements, all were quickly attended to.

A Notable Figure.

Sir Oliver Lodge, the retiring president of the association, was one of the foremost of the new arrivals. With Lady Lodge he was at once escorted to Government House. They will remain as guests of Sir Henry Galway during their stay in Adelaide. At the invitation of Mr. T. E. Barr-Smith, the Misses Lodge (2), will reside at "Birkgate," Glen Osmond.

Sir Oliver Lodge, who was born at Penkull, Stafford, has devoted his attention to many branches of science. Chiefly his work has been related to lighting and electrical subjects. He has also become a notable figure in the ranks of those who have devoted time to psychical research. Sir Oliver Lodge will to-night discourse upon the subject of ether in space.

The Roll Call.

The following is a list of those of the Science Congress who arrived on Saturday. Their places of residence during the Adelaide stay are also shown:—

- Andersson, Prof. G. (South Australian Hotel).
- Ashby, Dr. Thomas (Mr. H. W. Anderson, Medindie).
- Backhouse, Mr. W. A. (Newmarket Hotel).
- Bailey, Mr. P. G. (Newmarket Hotel).
- Balfour, Mr. Henry (Prof., Stirling North Adelaide).
- Bassett, Prof. Henry (Grand Central Hotel).
- Bolton, Mr. H. (Newmarket Hotel).
- Bond, Mr. and Mrs. C. I. (Mrs. G. S. Aldridge, N.A.).
- Dr. H. Borns (Commercial Travellers' Club).
- Boulton, Prof. W. S. (Grand Central).
- Bower, Prof. F. O. (Prof. T. G. E. Osborne, South terrace).
- Brown, Prof., E. W. (Niesche, Mr. F. W., Wakefield street).
- Brown, Prof. R. H. E. (Grand Central).
- Buckmaster, Mr. C. (Mr.).
- Chamberlain, Dr. R. P. (Mr.).
- Ward, Burnside. K.
- Chattaway, Dr. F. D. (Grand Central).
- Croesman, Mr. W. N. (Grand Central).

Choosman, Miss G. H. (Grand Central).
 Coker, Prof. E. G. (Mr. H. Law Smith, Glenelg).
 Coleman, Prof. A. P. (South Australian Hotel).
 Cole, Prof. F. J. (Mr. W. Duffield, Glenelg).
 Cora, Prof. G. (Mr. E. S. Paterson, South terrace).
 Cunningham, Mr. J. T. (Dr. A. M. Morgan, N.A.).
 Dalby, Prof. W. E. (Mr. Graham Stewart, Medindie).
 Dakin, Prof. W. J. (Grand Central).
 Davidson, Mr. W. R. (Botanic Hotel).
 Davis, Captain J. K. (Mr. William Burford, Glenelg).
 Dendy, Prof. A. and Miss (Mr. A. C. Minchin, Zoological Gardens).
 Denny, Prof. A. and Mrs. (Mr. H. Allnut, Parkside).
 Dixey, Dr. F. A. (Dr. R. H. Marten, N.A.).
 Dwerryhouse, Dr. A. B. (Grand Central).
 Dyson, Dr. F. W. (Mr. G. F. Dodwell, the Observatory).
 Eddington, Prof. A. S. (Grand Central).
 Eggar, Mr. W. D. (Rev. Canon Girlestone, St. Peter's College).
 Ewen, Mr. and Mrs. J. T. (Mr. C. B. Hodge, Toorak).
 Ferrar, Mr. H. T. (Grand Central).
 Fields, Prof. J. C. (S.A. Hotel).
 Golding, Mr. and Mrs. J. (Mr. J. S. Thomson, Kensington Park).
 Gonner, Prof. E. C. K. (Mr. W. J. Denny, South terrace west).
 Grasby, Mr. W.
 Gray, Prof. A. (Mr. H. Newport, Medindie).
 Gray, Rev. Dr. H. B. (R. Hewgill, St. John's Rectory).
 Gregory, Prof. J. (Grand Central).
 Gregory, Miss (Mrs. de, Marryatville).
 Gregory, Mr. R. (Mr. M. Black, N.A.).
 Grew, Mr. and Mrs. (Grand Central).
 Guthrie, Mrs. (Grand Central).
 Haddon, Dr. A. (Mr. C. Stirling, N.A.).
 Haddon, Miss K. (Dr. Helen Mayo, N.A.).
 Hamel, Mr. E. D. de (Grand Central).
 Harland, Mr. E. S. and Miss (Grand Central).
 Henderson, Mrs. (Grand Central).
 Herrington, Dr. P. T. (Grand Central).
 Hicks, Prof. W. M. (Rev. Wm. Jeffries, N.A.).
 Hobson, Mr. B. (Commercial Travelers' Club).
 Holt, Dr. A. (Grand Central).
 Hopkins, Mr. C. H. (Grand Central).
 Howe, Prof. G. W. O. (Grand Central).
 Hudson, Prof. W. H. H. (Mr. C. S. Seales, Medindie).
 Johnson, Prof. T. (Grand Central).
 Julian, Mrs. F. (Grand Central).
 Jungersen, Prof. H. and Frau (Grand Central).
 Lamplugh, Mr. G. W. (Grand Central).
 Leith, Professor R. F. C. (Dr. C. T. Crespigny, North Adelaide).
 Low, Dr. A. (Grand Central).
 Luigi, Professor L. (Mr. E. S. Paterson, South terrace).
 Lupton, Mr. and Mrs. A. (Glen Legoe, Unley Park).
 Luschan, Dr. and Frau F. von (Mr. H. C. E. Muecke, Medindie).
 Mass, Professor C. (Mr. C. Wittig, College Park).
 McCombie, Dr. and Mrs. H. (Grand Central).
 McFarlane, Mr. J. (Grand Central).
 Malinowski, Dr. B. (Dr. H. H. Palleine, Mitcham).
 Marett, Dr. R. R. (Dr. H. K. Fry, Norwood).
 Maynard, Mr. and Mrs. A. E. (Mr. T. Barr Smith, Glen Osmond).
 Milroy, Professor T. H. (Grand Central).
 Minchin, Professor and Mrs. E. A. (Dr. J. C. Verco, North terrace).
 Moody, Dr. and Mrs. C. T. (Mr. G. Brookman, Gilberton).
 Moore, Professor B. (Dr. J. W. Browne, Adelaide).
 Morgan, Professor G. T. (Grand Central).
 ... and Mr. C. (P...

Myres, Professor J. L. and Mr. C. (Professor H. Darnley Naylor, College Park).

Newton, Mr. R. (Mr. R. L. Jack, Kensington Park).

Nicholls, Professor G. E. (Washington street, Glenelg).

Nicholson, Professor J. W. (Mr. C. M. Todd, Norwood).

Oldham, Mr. H. Y. (Grand Central).

Parkin, Mr. T. (Grand Central).

Patten, Professor C. J. (South Australian Hotel).

Penck, Professor A. (Dr. von Lukowitz, North terrace).

Porter, Professor A. W. (Mr. E. Kyffin Thomas, North Adelaide).

Poulton, Professor E. B. and Mrs. (Sir J. Downer, North Adelaide).

Poulton, Miss (Colonel Makin, N.A.).

Rankine, Dr. A. O. (Grand Central)

Reichel, Sir H. R. (Professor J. Brown, N.A.).

Rendle, Dr. A. B. (Dr. R. S. Rogers, Adelaide).

Reynolds, Professor S. A. (Colonel Makin, N.A.).

Ridler, Miss C. C. (Botanic Hotel).

Rosenhain, Dr. W. (Commercial Travellers' Club).

Schafer, Sir E. A. and Lady (Mr. S. P. Walte, "Urrbrae," Glen Osmond).

Scharff, Dr. and Mrs. R. F. (Mr. A. E. Jolly, N.A.).

Scharff, Mr. T. W. (Commercial Travellers' Club).

Scott, Professor A. W. (South Australian Hotel).

Simpson, Dr. G. C. (Hon. D. J. Gordon, Unley Park).

Skyrme, Mr. C. G., and Mrs. (Grand Central Hotel).

Smith, Miss Lorrain (Professor Mitchell, Prospect).

Smith, Professor C. M., and Miss (Botanic Hotel).

Sollas, Professor W. J. (Mr. L. W. Bakewell, Fitzroy).

Steggall, Professor J. E. A. (Mr. R. Law Smith, Glenelg).

Stewardson, Mr. H. C. (Grand Central).

Stocker, Mr. W. M. (Newmarket Hotel).

Symington, Professor J., and Miss (Dr. R. S. Rogers, Adelaide).

Tatteraall, Dr. W. M., (Mr. Wm. Fuller, St. Peters).

Tins, Dr. H. W. M. and Mrs. (Grand Central).

Thomas, Miss E. N. (Grand Central).

Turner, Professor H. H. (Mr. Justice Murray, Magill).

Vaughan, Mr. A. (Mr. G. McEwin, N.A.).

Waller, Dr., Mrs., and Miss (Hon. J. Lewis, Glen Osmond).

Waller, Mr. J. C. and Mr. G. (Mr. J. R. Fowler, Norwood).

Walther, Professor J. (Dr. von Lukowitz, North terrace).

Witkiowicz, Mr. S. (Botanic Hotel).

Woodward, Mr. J. H. (Mr. C. T. McGlaw, Unly Park).

The following visitors arrived from the eastern States by the Melbourne express:—Professors Davis, J. J. Findley, and E. Goldstein, Drs. L. J. Briggs, and Rayne, Mr. and Mrs. A. H. Evans, Mr. and Mrs. Laurie, and Messrs M. M. Alorge, C. G. Abbott, F. Debonham, J. Hesketh, H. G. J. Moseley, and Watson.

HONORS FROM ADELAIDE

AD EUNDEM GRADUM DECREEES

CONFERRED ON VISITING SCIEN- TISTS.

The first public ceremony in connection with the visit of the British scientists to Adelaide took place at the Town Hall on Saturday afternoon when the University of Adelaide held a special congregation for the purpose of conferring degrees upon certain of the visitors. It was an interesting function, brilliant from a social point of view, and impressive because of the tremendous aggregation of learning there foregathered. The hall, which was filled to overflowing with people admitted by special invitation, was transformed by a splendidly executed scheme of decoration from a bare, gloomy structure into a place of warmth and brightness. On the walls pictures covered the nakedness of the drab plaster, and the intertwining of the British Royal Standard, the Union Jack, and the Australian flag supplied a patriotic touch appropriate enough under present circumstances. Two huge oil paintings of their Majesties King George and Queen Mary, kindly loaned by his Excellency the Governor, occupied prominent positions. A dense mass of pot-plants and palms hid the greater portion of the platform, and great bunches of wattle blossom clustered on every hand diffused the heavy, springtime fragrance of the Australian bush.

To survey the great gathering in the hall was to notice at once the bright notes of color provided by the multi-colored hoods on the gowns worn by the graduates and professors present. There were hoods of pink, yellow, white, red, and heliotrope, and an especially gorgeous one of green with red straps vied in effectiveness with the scarlet gowns of the Deans of the various Faculties of the Universities of Adelaide, Melbourne, and Sydney.

The front row of seats was reserved for the visiting scientists, and near them were the members of the University Senate and Justices Sir John Gordon, Murray, and Buchanan. The Chancellor of the University (Sir Samuel Way, C.J.), presided on the platform, and with him were the Commissioner of Public Works (Sir Richard Butler), representing the State Government, the Vice-Chancellor (Dr. Barlow), Professor Bateson (president-elect of the Association), the Mayor of Adelaide (Alderman Simpson), Professor Stirling, Sir Oliver Lodge (president of the Association), Sir Langdon Bonython, Mr. Alfred Chapple (headmaster of Prince Alfred College), and the town clerk (Mr. T. G. Ellery).

Demonstration of Esteem.

The remarkable love and esteem which Adelaideans have for that grand old man Sir Samuel Way was strikingly exemplified when he took his place on the platform. It was his first appearance in public since he was stricken down by the dread hand of disease, and the people did all in their power to show him that he holds an even higher place now in their affection than ever he did before. Sir Samuel looked remarkably well, and appeared to have lost none of that sprightly bearing which has characterised him even in his old age. The empty sleeve pinned across his chest provided the one pathetic instance, but it provided an opportunity for cogitation upon the wonderful courage and fortitude of the man who in the declining years of his life submitted himself to the surgeon's knife for a most serious operation.

The Ceremony.

The Governor (Sir Henry Galway) and Lady Galway arrived attended, by Mr. Mulholland (private secretary) and accompanied by Miss d'Eranger. As his Excellency moved towards the platform the city organist played the National Anthem, and the audience sang the verses with true patriotic fervor.

Professor Stirling's duty it was to present the visitors for degree. Prior to doing this he addressed the congregation and said he should surely be permitted to offer to the Chancellor of the University, on behalf of all its members their sincere and hearty congratulations that he was once more able to preside at one of their meetings. Though only entitled to offer these congratulations on behalf of the University, yet he was convinced that the sentiment he had expressed would be echoed by every member of the audience; indeed, by every member of the community of South Australia, who had known Sir Samuel so well and for so long. (Cheers.) Their chancellor has in his day played many parts with conspicuous ability, but in his long and varied life had shown no more admirable phase of his character than the inextinguishable optimism and the indomitable courage with which he had faced the severe ordeal through which he had so recently and so successfully passed. No words could better express his attitude in the presence of a great crisis of which no one could foresee the end than the simple phrase, "He played the man." (Cheers.) They, then, the members of the University, whose spokesman he had for the occasion the honor to be, not only congratulated him on his great recovery, but also with equal sincerity welcomed him back to the presidential chair from which he had for 33 years so ably and so zealously presided over the welfare and destinies of the University. And now that they had this striking example of his wonderful vitality, might they not hope that some of them might see him celebrating a half-century of occupation of his chancellorship? (Cheers.) It was necessary to add one word more. Though the chancellor's presence there that day was the best evidence of his recovery, they must know that he could not yet have regained the full measure of his physical strength. For that reason they had begged the chancellor that he would make no verbal reply.

to their congratulatory notes. They were sure that their good wishes would not go unappreciated.

A Significant Event.

The acceptance by the British Association of the invitation of the Federal Government to hold its eighty-fourth annual meeting in Australia was a gratifying incident in the history of the Commonwealth and of its constituent States. The hearty welcome that had been and would be accorded to this distinguished body by all classes of the community, wherever they might go, would assuredly reflect the general interest in the visit. How great was their regret that this meeting, which so many of them had looked forward with such pleasurable anticipation, should be held under the dark shadow of the war clouds that had burst over so great a part of the civilised world. And should they not extend their sympathy to their brothers in science who were countries no less than their own were involved in this devastating warfare. (Cheers.) To no institution was the visit more welcome than to the universities of the various States, and by none more appreciated, for it was an acknowledgment that Australia had earned and won for itself a place worthy of recognition in the world of science, and of intellectual thought. To mark, therefore, the importance of the significance of the event the Universities of Sydney, Melbourne, and Adelaide, acting in friendly concert, had resolved to confer their degrees upon a number of the visitors, distributing the recipients in fair proportion among the three universities concerned. By the limitations of its statutes the University of Adelaide had no power to confer honorary degrees. All that it could do under its charter was to confer its *deus ad eundem gradum* upon distinguished graduates of other recognised universities. But it was the wish of the University that it should be understood that when to-day it conferred its *ad eundem* degrees upon distinguished visitors the honor was intended to be in recognition of achieved distinction in precisely the same way and to the same extent as if they were honorary degrees in the strict sense of the term. And while thus honoring their visitors in the only manner possible to them the University of Adelaide felt that it was honoring itself. (Cheers.)

The chancellor then conferred degrees upon the undermentioned visiting members:—

Doctor of Science.

Sollas, Prof. Wiam Johnson, D.Sc., University of Oxford.

Panck, Prof. Arecht, D.Sc., University of Oxford.

David, Prof. Innatt William Edgeworth, D.Sc., University of Oxford.

Brown, Prof. West William, D.Sc., University of Cambridge and Sydney.

Lodge, Sir Oliv Joseph, D.Sc., University of London.

Jungersen, Prof. Hector Frederik Estrup, D.Sc., University of Harvard.

Howe, Prof. G.W. O., D.Sc., University of Durham.

Juritz, Prof. Chles F., D.Sc., University of the Cape Good Hope.

Von Luschan, Prof. Felix A. M., Ph.D., University of Munich.

Doctor of Medicine.

Smith, Prof. Elliot, M.D., University of Cambridge.

Master of Arts.

Hall, Alfred Deiel, M.A., University of Oxford.

Coleman, Prof. War Philemon, M.A., University of Toronto.

Bachelor of Arts.

Lucas, Sir Charles Prestwood, B.A., University of Oxford.

Bachelor of Science.

Beare, Prof. Thomas Hudson, B.Sc., University of London.

The chancellor heartily welcomed Professor Beare, who he pointed out, was one of the first graduates of the University of Adelaide.

The President Replies.

Sir Oliver Lodge replied on behalf of the newly-admitted graduates. He said that as president of the British Association for the Advancement of Science until its meeting in Melbourne he had received from his Excellency the Governor-General of the Commonwealth (Sir Ronald Munro-Ferguson) the following telegram:—"I heartily welcome you and the members of the British Association to Australia. I wish your visit could have taken place at a less anxious time, but trust in spite of the grave preoccupation of the moment

your visit may be a happy one and fruitful of good results." (Cheers.) He proposed to reply thanking the Governor-General for his good wishes. When they left England to hold their meeting in the Antipodes they did not expect to arrive there during the Armageddon, the reverberations of which eruption were being felt round the world in unmistakable manner. They might have thought that in going to Australia they would have been far enough away from the scene of operations to feel its effect, but it was not so. It reminded him of the eruption of Krakatoa, which was felt round the world in a manner interesting to science. They would remember that that eruption, disastrous as it was at the time, left behind it a glory of sunset beautiful indeed, but in the circumstances quite disproportionate to the magnitude of the disturbance. The experience of recent years in warfare had been that when peace returned the nations were immersed in the beauty of international peace and friendship and mutual respect established on a stronger basis than before. He could not but think that when the present war was over this would again be the case, and he hoped that it would never fall to their lot to witness such an upheaval again. Under the circumstances a special meeting of the council of the association was held that afternoon, and an offer was made to abandon any item in the programme that might seem out of

place or be rendered difficult of achievement. A resolution was unanimously passed, and would be handed to the press. Professors Orme Masson, David, and Starling, however, on hearing the resolution, all assured the meeting that while appreciating the meaning of the offer they felt that for the most part the business of the association should go on undisturbed and as arranged, but they agreed that there were social items on the programme which might well be modified. There might be difficulties of transport which would render excursions rather difficult, and the hope was expressed that any shortcomings in that respect might be overlooked. The meeting had assured the local professors that the visitors were entirely in their hands; the difficulties were recognised, and all appreciated the efforts that had been made on behalf of the visitors.

A Difficult Task.

It had not been easy for the members of the British Association to give up their work for so long and visit Australia, but the call to Australia was irresistible. (Applause.) He remembered the meeting of the general committee at which the Australian representatives were present in London. He knew that many of the members went to that meeting determined to resist the request that the association should visit Australia, but the spokesmen of the Australians (Sir George Reid) and Professor Orme Masson spoke so eloquently and persuasively—he had seldom heard better speakers—that the opinion of those formerly hostile to the proposal was entirely changed, and the proposal was carried unanimously. And now they had been honored by the University of Adelaide. He would not venture to say anything about the professors now on visit to that university, but he would remind those present that Adelaide sent to London a distinguished physicist, Professor Bragge, whose great work had excited the admiration of the scientific world. (Cheers.) The manner in which Professor Bragge had used the X-rays to discover and demonstrate the molecular arrangements in crystals and the arrangement of atoms in molecules had been most extraordinary. He had made manifest most of the investigations of Professor Pope and Professor Barlow. Associated with him was his son, who was of great assistance to him in his work, thus showing that the science of crystallographic rearrangement had descended to the second generation. (Applause.)

"On behalf of myself and our members," said Sir Oliver in conclusion, "I offer you very hearty thanks for the honor you have done us."

Cheers were then given for the King, the audience again sang the National Anthem, and the ceremony concluded.

WELCOMED BY THE GOVERNMENT LARGE GATHERING AT THE TOWN HALL

THE VALUE OF SCIENTIFIC RESEARCH.

The official welcome by the Government and the citizens was tendered in the Town Hall in the evening, when there was a large and representative gathering. The visitors were introduced to the Governor and suite and the members of the Ministry, after which welcome speeches were delivered. The Premier (Hon. A. H. Peake) occupied the chair.

The Governor said that in the name of the citizens of South Australia he was pleased to welcome the distinguished delegation from the British Association, the name of which was honored wherever science was pursued. They thought with pride of the foundation of the association 82 years ago, at the instance, he believed, of Sir David Brewster. It was then a small body, with a few sections, but had now grown into a very large function, presided over by a general president, supported by 13 presidents of sections. The annual session of the association had several times been held in one or other of the dominions, and he ventured to hope that their deliberations in this quarter of his Majesty's dominions would be as fruitful as any before. As they all knew, the Commonwealth Government had expressed its satisfaction at their visit in the practical form of a subsidy, a method of appreciating science which was much

to be commended. Pride in the accomplishments of science was perhaps more legitimate than pride in any other form of human accomplishment. Peaceful conquerors of unknown realms, their readiness, their researches, and investigations, their discoveries, all proceeded quietly, while the great material world went on its noisy way, little realising the value of all the persistent, painstaking work until it touched the practical affairs of daily life. One lesson that the visit of the British Association to Australia should bring home to the public mind was that scientific investigations were worth paying for, and that money used for the endowment of chairs of science in seats of learning was an investment valuable beyond computation. When the association met at Birmingham last year many in this country who could not pretend to be even moderately acquainted with science read with deep attention the report which reached them of Sir Oliver Lodge's presidential speech, which dealt with the continuity of natural phenomena. Here, as at home in England, the work of the association's eminent past-president was a known force in the thought of the day, and they were gratified to find the retiring president with them that evening. (Applause.) The president-elect—Professor Wm. Bateson—was also well known to the students in Australia as elsewhere, as the distinguished authority on heredity, and other gentlemen of equal eminence were with them. Before such a gathering of authorities in all departments of science a layman was easily led to discover his own ignorance, which, however, was no bar to gratitude to men of science for their valuable and laborious work. He was but expressing the sentiment of every section of the community when he said that in welcoming the British Association to Adelaide they felt it was not only an extreme pleasure, but an equally great privilege and honor. That the visit of their association should be clouded by the great crisis through which the Empire was passing was a matter of deep and universal regret, but they felt that in their hearts they must be humble and pray to God to strengthen the nation in the hour of her trial so that the British Empire might emerge from the struggle with dignity, honor, and increased glory. (Applause.)

The Premier said he had the greatest pleasure, on behalf of the Government and people of the State, in giving the distinguished visitors a cordial and

friendly welcome to South Australia (Applause.) It was indeed a great honor that had been done to Australia in that the members of the illustrious British Science Association had chosen this far-off land which to hold its assembly this year. It was recognized that the association represented the very flower of the twentieth-century civilisation, and the highest point to which culture and research had carried the human mind. Their labors in the field of science had not only raised them, whose names were familiar in people's mouths as household words, to positions of envied pre-eminence, each in his own domain, but they must feel, as every citizen did, a joyful satisfaction in knowing that with their own ascent to such lofty heights, the name and fame of our common country and race had been lifted as well. The visitors had arrived here in the course of their peaceful pursuits in the midst of great disturbance and anxiety of the public mind, when thoughts of the stirring events that were now taking place in the dear old mother country were causing deep emotions to swell within them as to the safety and happiness of the dear ones whom they had left behind in "The little grey home of the west." (Applause.) But the Government and citizens felt sure that they would be comforted by the thought that the scientists had their deepest sympathy, and further in the assurance that they were surrounded by people who were just a little more British than the English themselves, if that were possible. (Applause.) They would find that all were equally concerned with respect to the security of the Empire, and also as to the success of the brave sailors and soldiers on sea and land. It was a happy circumstance that the visitors should be here just at this time, for apart from those things of special interest from a scientific point of view that they might discover in the course of their investigations, they would not be able to avoid the abundant manifestations on every hand of the deep and abounding loyalty and devotion of Australians to the person and throne of their beloved King. In that England was at war, Australians were at war, too, and they would rejoice in knowing that the full resources of the Commonwealth were at the disposal of the King in this terrible crisis. (Applause.) The visiting gentlemen had gained their laurels and eminent renown as victors and conquerors in the fair fields of peace, and their minds will no doubt dwell with hopeful contemplation on that happy time when war should be no more, and "when universal peace should lie like a shaft of light athwart the land." He and other citizens shared with them in that great hope and aspiration of the human race. The greatest pleasure that could be wished for their guests was that even while they were in this country, which happily had never felt the rude shocks of war, they might be able to join their thanksgivings with Australia in celebrating the restoration of peace to the Empire and to the world. (Applause.)

Sir Oliver Lodge, in replying on behalf of the delegates, said the visit of the association was unfortunately clouded by a great crisis. Still, their welcome was no less universal and sincere. For many years he had been connected with the British Association for the Advancement of Science in various capacities. He attended his first meeting of that body in 1873, and had missed few meetings since. He felt he owed a great deal to the opportunities it had afforded him, especially when he was a younger man, of meeting on terms of friendship and assurance men of far greater intellectual ability. The association was sometimes regarded as purely a social organisation. That was not so. Their social intercourse served a purpose, for it enabled them to exchange views and become acquainted with each other. Their studies were carried out over widely separated areas. There remained a great number of discoveries to be made in the realms of medicine, and science, and he considered that Governments should be a little extravagant rather than niggardly in their practical support of scientific investigations. Science prospered in times of peace, which was largely the reason for the great advances made during the nineteenth century. They had a great many lessons to learn from Australia, one of which was federation. (Applause.) Mention of federation brought to mind Tennyson's famous lines, with the sentiment of which they were all in accord:—

"When the war drum throbs no longer,
And the battle flags are furled,

In the Parliament of man,
In the federation of the world,"

(Applause.)

During the evening the Adelaide Male Quartette (Messrs. Wood, Charlton, Norfolk, and Vardon) contributed several musical numbers. Supper was served in the supper room, and after a pleasant social evening the gathering dispersed.

WATTLE DAY LEAGUE'S WELCOME.

Mr. Will J. Sowden addressed the following letter to Sir Oliver Lodge:—"I venture to address you in my capacity as

Federal president of the Australian Wattle Day League—a patriotic society which has flourishing branches in every State of the Commonwealth and in the mother country itself—and also as president of the South Australian branch of that league. The members of the league desire to extend to you, as the official representative of the world-famous British Association, a most cordial greeting, and request you to accept as an earnest of their goodwill the accompanying example of the beautiful golden wattle blossom which is the badge of the league and the national flower of our dearly loved Australia. Our league recognises in its membership no distinction of birth or class or creed and no bond but that of patriotism, and its members fondly cherish the golden wattle blossom, less on account of the great economic value of the tree on which that blossom grows, than because they regard it as a peculiarly fitting symbol of the golden grain, golden fleece, the golden metal, the golden light, the golden opportunities, and the golden hearts and aspirations of Australia and Australians—loyal sons and daughters of Great Britain."

THE NORTHERN TOUR.

A party of members of the science visitors left Adelaide on Saturday afternoon for Port Pirie. Mr. E. Lewis, of the Broken Hill Proprietary Company, acted as director of the tour. Yesterday the party was to proceed across the gulf to the Iron Knob iron deposits. To-day they are to inspect the smelting works at Port Pirie, and in the evening will take their departure for Broken Hill, where on Tuesday they will be the guests of the Mine Managers' Association, and will make a visit to the mines. To-morrow night the delegates will set out on their return to Adelaide. Among those who booked for the northern trip were Sir T. H. Halland, Professor Henry Bassett, Professor W. S. Boulton, Dr. F. D. Chattaway, Captain J. K. Davis, Dr. A. B. Dwerryhouse, Professor J. W. and Miss Gregory, Dr. A. Holt, Professor E. S. Moore, Professor G. T. Morgan, Professor A. Penck, Professor S. H. Reynolds, Dr. N. V. Sidgwick, and Messrs. G. W. Lamplugh and H. Tizard.