had to be carried out under conditions of comparative freedom from the anxiety associated with ordinary necessities of life. During the war there had been a great manifestation of scientific effort, although it was chiefly devoted to the purposes of national defence, and after the war there arose a real fear that the need for pure science research would be no longer felt. Unfortunately there was still ground for that fear which was seen by the lack of adequate financial support which was accorded such institutions as were represented at the present congress. No form of applied science could come to birth unless preceded by abstract pure scientific research. (Applause.) Examples of that fact were to be found in every walk of life. The Australian nation could not afford to blunder through life, and the more it developed the more clearly it would need to realize that it could not make any marked progress to real greatness unless aided by the genius of sciences and by such associations as were there represented. It existed mainly for the purpose of familiarizing the general public with the progress of science and its teachings.

Science Research Council.

Taking advantage of the presence of so many of their members in Adelaide in connection with the sessions of the Australasian Association for the Advancement of Science, the Science Research Council held a meeting at the Prince of Wales Theatre at the University on Monday morning. Sir George Knibbs presided.

The special committee in connection with the freezing of meat reported that during the last 12 months apparatus necessary to conduct their experiments had been obtained, and practical operations were conducted toward the end of the period. The apparatus consisted of a steel tank 12 ft. by 6 ft. by 4 ft., fitted with a set of expansion coils and the whole had been installed at the Government cold storage at Victoria docks, Melbourne. By means of calcium chloride brine it had been possible to obtain an extreme range of low temperatures. Experiments on small portions of beef and been carried out in England so that the object of the researches in Australia was in connection with larger pieces of beef—quarters, in order to determine whether it was practicable to eliminate or reduce "drip," by means of rapid freezing. The beef was frozen by means of brine at low temperatures, and then would be thawed at different rates of progress. It was hoped by that procedure to arrive at the most effective and economical methods of both freezing and thawing by which to treat beef so as to eliminate "drip."

The Zoological Survey Committee reported that steps had been taken in New South Wales to commence a biological survey in that State and the trustee of the National Park had made available a cottage at Port Hacking, which would be the headquarters of the biological section, which had been formed in the Zoological Society of New South Wales.

The Western Australia State Committee submitted a request to the council that something might be done in regard to the standard of lime, and the council decided to approach the standardization committee with a view to lime standardization.

The following new members were elected:—Dr. W. G. Woolnough (Sydney), Dr. H. Kidson (Melbourne), and Professor L. Harrison (Sydney).

WHAT THE WORLD OWES TO ELECTRICITY.

POWER DEVELOPMENT IN AUSTRALIA

ENTHRALLING LECTURE BY SIR JOHN MONASH.

In a Presidential address of intense interest, delivered to the assembled members of the Australasian Association for the Advancement of Science at the Adelaide Town Hall on Monday night, Sir John Monash, Chairman of the Electricity Commissioners of Victoria, the man under whose direction the Morwell electricity scheme came into being, dealt with the subject of "Power development." In concise, easily understood, sentences, he told his audience just what the world owed to electricity, and the enormous scope that still remains for the development of the industry. That development, he said, was a problem of first-class magnitude in both its engineering and financial aspects. The immediate attention of scientists, engineers, and statesmen was required to the problem of satisfying the demand for electric services which was confronting Australia. They would have to evolve far-reaching plans for meeting the situation, take exhaustive stock of their various resources for power production, and estimate their respective extent and capacity.

The audience included His Excellency the Governor (Sir Tom Bridges) and Lady Bridges, who were attended by Capt. J. Hambleton, A.D.C., the Chief Justice (Sir George Murray), the Lord Mayor and Lady Mayoress (Mr. and Mrs. C. R. J. Glover), Sir Baldwin Spencer, Sir Edgeworth David, and a number of other highly important people in the scientific world.

The Induction.

In inducting Sir John Monash to the Presidential office, the retiring President (Sir George Knibbs) said that one of the most delightful of all the duties which the President of an association like theirs had to perform was that of inducting his successor into the chair of office. Especially was that so when that successor was one whose career had given evidence of great ability and had been marked by public service of a very high character indeed. The month of August reminded them that it was just six years ago that the Australians, with the Canadians on their right flank, and the British on their left, delivered the German army a series of terrible blows, that broke their supposed impregnable line beyond repair, and changed the whole aspect of the war. The plan and control of that offensive was that of their new President. But what Sir John Monash had done for the defence of the great nation to which they belonged was well known to them all, and in asking him to take on the duties of President of the association, and to take the chair which, in a few minutes, he would vacate, he felt that it was really quite unnecessary that he should refer further to those matters, for he was well known to every one throughout Australia. Sir George then referred to Sir John's career, which was fully outlined in yesterday's Register. Continuing, he said that the testimonies by Australia's distinguished Allies of appreciation of his achievement and of his personality, showed that the estimation in which he was held in distant lands was akin to their own. They all knew, also, that at the present time he was Chairman of the State Electricity Commission of Victoria, where he was doing very novel and most important work for that State. Great numbers of them read his "Australian Victories in France," and knew his powers of expression in their language. Born in Victoria, he was an Australian of the Australians, and every scientific man in Australia welcomed him in the office which he had accepted, and to which he now inducted him. In asking Sir John to take the presidential chair, and to give his address, Sir George wished him a most successful period of office, and he needed hardly say that they all gave him the most hearty welcome as their new President.

Sir John conveyed to the assembly his deep appreciation of the coveted honour done him by his election to the Presidency of the association. He thanked the retiring President (Sir George Knibbs) for the generous terms with which he had been introduced. It would be his earnest endeavour to worthily fill the office which Sir George had just vacated. He took the opportunity, on behalf of the association, to express to the people of Adelaide, and of the State, their warmest thanks for the ready and considerate hospitality in so many quarters which had already assured the success of the meeting and the comfort and pleasure of all the visiting members. It was 17 years since the Association held its meeting in Adelaide. The world had, in the interval, passed through a fiery ordeal, and the free interchange of thought between men of science among the nations had been, for some years, rudely interrupted. But science was cosmopolitan; the search for truth knew no international boundaries. And so they might hope that, as the echoes of the Great War died away, the people of the earth would again, as in the old days, reap the benefit of a world-wide community of thought and purpose in the task of wresting the secrets from Nature. He expressed the acknowledgments of the association to Professor A. Liversidge and Professor Sir William Bragg in representing the association body at the meeting of the British Association. He wished to direct the attention, and enlist the sympathies of, the members of the association, and the Australasian public generally, to a highly important and essentially Australian field of science research which had been opened up since the last meeting in the formation of the Great Barrier Reef Committee with Sir Matthew Nathan at the head. The Great Barrier Reef was of such surpassing interest and value that it should be studied exhaustively. It possessed many products of high commercial value, such as pearl, tortoise, and other shell; beche-de-mer, sponges, and the like, as well as, very probably, fish food on a vast scale. The causation and the adaptation of these resources to serve human needs were worthy subjects of study to the geologist, the zoologist, and physiographer.

Power Development.

One of the purposes of the association was to familiarize the general public with the achievements of science, and to create a widespread interest in scientific progress and in the patient investigations from which it springs, Sir John continued. Therefore it had seemed to him that it would not be inappropriate to attempt, upon that occasion, an exposition of the practical application of scientific discoveries in a particular field of human endeavour which had become of paramount importance to the progress of civilization. He referred to "power development." It had been his fortunate task, in post-war days, to assume the direction of a great undertaking of that nature, in Victoria, and to labour in a field of applied science, of which a phenomenally rapid progress had been the chief attribute.

Than electricity it would be difficult to instance any other department of science in which abstract research and experimental investigation had led so repeatedly, and with such convincing directness, to practical advancement. Electric energy had become the servitor of humanity. Its utility was assuredly destined to expand until it might even dominate future civilization. In the course of a single generation they had witnessed the almost complete obliteration of a social and economic condition which was thought to have been the acme of progress. Factories, industrial plants, and workshops, belching forth pollution through forests of chimney stacks, were almost a thing of the past. The days of the steam railway locomotive were numbered. Electro-chemical and electro-metallurgical processes, entirely unheard of a bare decade or two ago, had superseded methods then looked upon as fully perfected. Motive power in almost every form had become the offspring of electricity. The conditions of domestic life had been wholly transformed. The civilized world was becoming, by a process of peaceful penetration, steadily, but none the less surely, electrified.

Those master strokes of progress had been delivered silently, insidiously, and relentlessly. All the physical sciences had at every stage made their contribution to each successive advance. Each advance had stimulated fresh enquiry, and had become the "jumping-off line" for another forward bound.

In the light of the transformation which had taken place, within the short period of a quarter of a century, the electricity imagination was completely baffled in any attempt to foresee — with convincing sureness— the influence wihch the development of electric power might have upon society in the next decade or two. The speculations which were announced during the closing years of last century, as to the approaching broadcast use of this new form of energy—arrestingly fertile as they were—had been completely falsified. Nor could it have been foreseen how the whole social fabric and every phase of human activity would have become transformed.

Growth of Consumption.

The application of electricity to the service of man began, on a modest scale, and with a very restricted scope, in Europe and America some 40 years ago, the lecturer continued. There were many still living who could remember the first serious entrance of electricity into the social structure. Scientific research had not then progressed beyond the point where it had been found to be possible to generate a direct current by the use of electro-magnetic machines known as "dynamos," and to transmit the same, by the aid of metallic conductors, for limited distances, and with indifferent efficiency. The requisite motive power was provided by small steam engines of the reciprocating type, and was at first applied in a primitive manner by belt drive. The use of the current so produced was confined, for some years, to lighting purposes in restricted city areas, in isolated buildings, and in groups of shops. The form of electric lamps then employed had long ago been superseded as woefully inefficient.

The relatively low voltage at which the direct-current system could operate was the reason for the very restricted area of supply. Efficient distribution was limited to a distance of less than one mile from the generating station. Recognising those limitations as a bar to further electrical development, physicists and engineers embarked upon an active search for means to widen the radius of influence. The result of much patient research had been the evolution of the alternating current system of generation and distribution as known and practised to-day—a system which has no limitations of range, at least on the technical, if not under all conditions on the commercial side, and which permits of the conversion or "transformation" of electric pressures within the widest requisite limits. It furnishes in its entirety, a system of extraordinary flexibility and adaptability to all the needs of civilization.

SIR JOHN MONASH,
who last night was inducted as President of the Science Congress, and delivered an address on power development.

Those discoveries released the bonds which had been retarding the growth of electric systems. It was in the last decade of the nineteenth century that alternating current generating plant was put into use, for the first time, on a substantial commercial scale, and from that date the electric era dawned in earnest. Subsidiary doors in the path of development were, in the years thereafter, unlocked one by one. The alternating current induction motor was perfected by Tesla in that decade also. The invention of the steam turbine about 1895 made it available for adoption later as a prime mover, in substitution for the reciprocating steam engine, and so gave birth to the modern turbo-generator which combined in one unit, and upon the same shaft, both the steam drive and the electric generation. Thereby a great advance was made in the economic use of steam; generation costs were lowered, and electric energy was the better able to overcome its commercial rivals.