In reply to a question asked by Mr. W. Kent (Queensland) Professor Robertson stated he secured the field of investigation in the Black Sea because that there could not be much endeavor. The pastoralists and the theorist could start work from different ends, but they would meet in the middle. They would be mutually dependent on each other for assistance. The Commonwealth had accepted the generous offer of 30,000 acres of excellent country in Queensland from the Government for experimental purposes, as the land was too good for their purpose, and did not afford them the opportunity of studying the question of rabbits they were concerned. If they could not furnish results commensurate with the magnificent offer they felt they should refuse it. The investigation into animal genetics which the bureau was not conducting might be carried out there. He thought it would be a good thing if the graziers accepted the Government's offer of the land for that purpose. The bureau would co-operate and advise the graziers, but unless men most suitable to direct the work. The practical work would have to be done by the pastoralists. An investigator was engaged in gathering information on the acute position in Queensland, which would be of use when the subject of the whole of the Commonwealth was being dealt with.

DISEASES IN STOCK.

DIFFICULTIES OF INVESTIGATORS.

Professor Woodruff, in addressing the delegates on the work of the council with relation to diseases in stock, said that the bounden duty of Australians, whose country was comparatively free from the scourge of ethic diseases, to act in those that existed. The first essential for good wool clips was healthy sheep. Much work had to be done to bring about the desired state. Stock were affected by parasites. Much work had been done in England, South Africa, and America, investigating the species of parasites that caused various diseases, in the treatment of the diseases, and methods of curing the causes. In Australia very little had been done. They were content to rely on the results of work carried out elsewhere. There was an urgent need for investigation. He had received a report that sheep were dying on one station, and that there were no parasites in the dead sheep. He conducted a post-mortem and a microscopic examination disclosed the presence of worms in the mucous membrane of the stomach. There were many things that could not be seen by the eye that needed investigation. Before the council could in various places under different names, was an example of the diseases that needed attention. The disease was caused by a type of bacteria, about which nothing had been known until the scientists of the world, turned on the spotlight. Loss of life from gut or gangrene in the wool, discovered methods of treatment. To-day those methods could be applied to sheep disease. A similar disease was wiping out the sheep in Ireland, until a vaccine was discovered which proved successful. In Tasmania, the disease was brought by the same name in Tasmania, was different from that in Western Australia and New South Wales. The knowledge of the disease was not sufficient on which to base their deductions. They could only hope to combat it by investigation. The disease in Australian sheep, under Australian conditions. That could not be done while pastoralists declined to tell them where the sheep died of disease, unless they received the confidence of the pastoralists they could not proceed. Their confidence could be secured. Ninety per cent. of the carcases for export had been condemned in the past 12 months but means they suffered from tuberculosis or septicemia. Before the embargo nobody thought it worth while to investigate the subject. Years ago Drs. Cherry and Bull had discovered the disease was caused by a germ they isolated, but no more was done. Now that lambs had been condemned for export, growers were anxious to find a remedy. A man had been put on to investigate the subject, and in Perth a meeting was held to discuss the matter in hand. They were conducting experiments to show how the disease was contracted, and how the germ entered the sheep's body. Until the position grew serious they could not get any support for their investigations. He was receiving support from France, where a vaccine had been made which was useful in that country. He had received 1,000 doses of the previous day, and they would be used in the experiments. No country was more favored than Australia to rid itself of tuberculosis in cattle. Denmark under adverse conditions had reduced its infection from 50 per cent. to than 5 per cent. to 10 per cent. It was said it was a pity it should not be wiped out in Australia. Very little had been done here, but he had hopes that something might be attempted. He had applied to the Pasteur Institute for a culture of a vaccine discovered in the laboratories, and it could be told the cost. He promised if the price was beyond his means he would return the culture. He received the culture and a letter, explaining that there was only one condition attached to its delivery, that he did not commercialise it, and would give it away wherever it might be useful. The spirit of Pasteur, who patented his great discoveries, that they could not be commercialised, so that humanity could be free to give them to humanity.

Pleuro-pneumonia did not exist, except in the back number countries of the old world. Nothing much had been done to investigate the disease, but they were working hard. Congresses had already discovered a blood test, which gave an 80 per cent. reliability in diagnosing the disease. It was not a "hot-house" or "head in the sand" attitude, and give the investigators their confidence. Money was available for the investigation, which was too good for their purpose, and did not council, but it would only be available while the force of public opinion existed. Congresses with the council would lead to results which, he confidently hoped, would justify its expenditure. It would be a good investment in the future, if it received support.

Sir Graham Waddell condemned the action of those who sought to hide diseases in their flocks, instead of placing them at the service of the investigators. He gave concrete examples of where such things had happened.

Another member said he had come sheep suffering from Braxy. They were not in the Australian Pastoralists' Delegates were unanimous in expressing their desire to operate with the council.

VISIT TO URRBRAE.

NUTRITION EXPERIMENTS.

Delegates to the Federal Conference of Pastoralists and Woolselling Brokers visited the Waite Institute for Agricultural Research on Thursday afternoon. They were received by the director (Dr. Hutchinson) and A. E. V. Richardson, who stated that the institute was established as a result of the generosity of the South Australian pastoralists—Mr. Peter Waite—who left the property of 200 acres of land, 30 miles from Adelaide, together with an endowment fund of £60,000, to maintain it. The total value of the land, and endowment fund was £100,000. The endowment contributed by the University 5 per cent. on the value of the bequest, £5,000 per annum. Hence, the revenue from the bequest and endowment fund totalled £8,000 a year. Mr. J. T. Mortfrom philanthropist, had also made considerable contributions to the institute, totalling £1,500 had been made by independent firms and the Superphosphate Association of Australia. The Commonwealth was also contributing a proportion of the revenue each year had been devoted to capital account—the erection of buildings, equipment, laboratory equipment, &c. The object of the institute was the investigation of scientific problems underlying the production of the pastoral industry. At present the scientific work was confined to soil and plant problems, as funds available would not permit of research in animal breeding. The work was being conducted in the field and pot culture houses, and in the laboratories and in the stable buildings and two in the basement of the house. It was hoped to have the laboratory equipment and laboratories erected within the next 12 months. The work at present in progress comprised—Cereal culture, cereal breeding, agricultural chemistry and investigation of soil problems. Plant pathology and the investigation of diseases of cereals and of tomato wilt.

A set of permanent field experiments was essential for the investigation of problems relating to the production and utilisation of farm crops. The field experiments supplied the data which the laboratory work practice were ultimately based, and provided material for laboratory work in soil chemistry, and plant pathology. The laboratory work comprised investigations of various methods of testing for the effect of manures on wheat, barley, grass, natural and seeded pastures, cultural and tillage tests, rate of seeding and time of seeding, and the effect of variety tests of the principal farm crops, and investigations into the best methods of producing and preserving green fodder and grasses. In the laboratories and pot-culture houses intensive studies were being made of the effect of manures on the higher supply of farm crops, pasture, and forage plants, and the production of dry matter, and the effect of manures on a limited rainfall more effective by the use of fertilisers, adjustment of the rate and time of seeding, use of improved varieties, &c.

Australia's Most Important Crop.

A considerable amount of work was being undertaken on pasture research. Australia was by far the most important of all crops, for practically the whole of the sheep and cattle of Australia were fed on natural pastures. Research on natural pastures was therefore of vital importance to the pastoral industry. The rainfall of the Waite Institute, therefore the investigations made there would be applicable to a large area of sheep country. There was also the opportunity, very little systematic work had hitherto been done on problems associated with the improvement of pastures. This was probably due to the fact that a tropical pasture sward was highly complex, and variable even within one locality. It was, moreover, very plastic and susceptible to slight changes in environment, e.g., manuring, grazing, and burning. The composition of the pasture was dependent on the character of the season and the method of grazing. The investigations at the institute were being conducted along five lines—Comparison of the value of introduced and indigenous species of grasses and fodder plants—Some 150 species of grasses and clovers had been collected and grown in a system garden for preliminary observation. The most valuable were selected out under field conditions. So far, five grasses and clovers had been found to do exceedingly well, and were being tested out on a large scale. They were Danthonias (the various species of wallaby grasses), Wimmera rye grass, Phalaris tuberosa (perennial), a bulbous subterranean clover, and cluster clover. Other grasses were exceedingly promising, and would in due course be tried out under field conditions. 2. Improvement of pastures by top-dressing with fertilisers—Tests were conducted of various fertilisers on natural and artificially seeded pastures. Determinations were being made of the influence of various kinds of phosphatic dressings, lime, and nitrates on natural and seeded pastures. The effect of the fertilisers on the growth and development of pastures, their grazing and nutritive value, was being determined. 3. Studies were being made on the effect of grazing on the composition and character of the pasture, the effects of very heavy and continuous grazing, intermediate and light grazing on the composition, nutritive value, and succession of the herbage. 4. The improvement of native grasses by selection—At present the possibilities of improving the Danthonias or species of wallaby grass, were being tested. These native species were very widespread throughout Southern Australia. Some 40 Studies were being made on the effect of Danthonias are being tested in the field. 5. Finally, investigations were in progress on the effect of different seasons and excesses of mineral nutrients on the growth, composition, and nutritive value of the herbage.

It was well known that there was a close correlation between the chemical composition of a grass and the composition of the soil on which it was grown. If mineral nutrients were deficient in the soil, the herbage grown on that soil would be deficient in those nutrients, and the stock feeding on the herbage would suffer from malnutrition. The importance of maintaining the role of mineral nutrients in the composition of pastures was emphasised at Cambridge and Aberdeen. An experiment of interest to pastoralists was being conducted at the institute. This experiment consisted of five one-acre fenced plots treated with varying types of grazing, the changes in the composition of the pasture succession brought about by cutting pastures weekly, fortnightly, and monthly, and at the close of the season were being investigated on another series of plots.

Sheep Nutrition.

The party was conducted round the different pasture experiments in progress, the processes being explained by Dr. Richardson and Mr. H. C. Trumble. Later Professor Brailsford Robertson described the proposed series of experiments with sheep fed on chaff. The institute hoped to be able to decide, from a study of data representing the growth of any given animal, what particular set of conditions it was necessary to provide, if it was possible, after a good deal of research, to take a short cut to ascertaining what the conditions were in the particular case in which sheep did not do well. With absolute control over what the animal ate, data showing the quantity and quality of the nutriment an animal required to barely maintain itself, how much to make normal growth, and how much to produce fat itself. Experiments would also be made with artificial legs and, for the first time in Australia, a new calorimeter would be used to see how much of the energy actually used, which was often quite a different figure to the amount it ate.

The party inspected the laboratory and chemical laboratory, where the work of studying soil problems was briefly described by Professor Ashby. A Russian tea had been served in the house the president of the Woolselling Brokers' Conference (Mr. Wood) said he was very inspiring to see what a pioneer had done for research. They had had most interesting addresses on the subject during the past few days, and he thought it might be said that they had made a forward step in Australian pastoral work, and had set up the necessity for research into their particular problems. Mr. Waite had set them an example which they were bound to follow; pastoralists generally would surely do something for the greatest industry in Australia.

Dr. Richardson said he was pleased that representatives of the greatest industry in Australia considered scientific research deserve consideration. He had always wondered why this great industry had, in the past, been somewhat indifferent to the appeals of science. They had work being in an institute which had been left and endowed by one of the greatest sheep men of Australia. Pioneers in South Australia. He hoped they would come again at a more favorable time of the year, when they could see performance instead of promise. (Laughter.)

The visitors later made an inspection of the institute, the collection of pastoral and agricultural maps which have been compiled by the institute.

Mr. Marmion Matthews Bray, LL.B., who died at Mount Lofty on Tuesday, at the age of 40 years, had an exceptionally brilliant career. The elder son of Mr. and Mrs. Christopher Bray, of 88 Brougham Place, Prospect, he was born at North Adelaide, on August 4, 1887. After his earlier years was educated at schools in the country, where his father was located; the latter, it may be mentioned, continuing with the Education Department until last year, his final position being that of head master of the Sturt Street Public School. The son obtained a Government bursary while at the Willunga School, and that entitled him to three years at St. Peter's College. There he won the Way and the Bowman I. and II. Scholarships for science, and in 1909 he secured the

THE LATE MR. M. M. BRAY.

Young Exhibition, being dux of the college. He had also won the Sir E. T. Smith Prize on several occasions. Having passed the Da Costa Scholarship, which took him to the University, he entered upon the study of law in 1904. He was the second Da Costa scholar, Mr. H. K. Paine (the present Commissioner of Insolvency) having been the first scholar. Mr. Bray completed his course with distinction, his first-class passes in different law subjects being three in the first year, two each in the second and third years, and three in the final year. He graduated as bachelor of laws, and won the Stow Scholarship in 1907. He served with Mr. (now Sir Frederick) Young, and just prior to completing his articles he entered the Federal Public Service about the year 1910, in the Attorney-General's Department. He was later transferred to the Federal Taxation Department as secretary, and soon after became Deputy Commissioner of Federal Taxation for Victoria. In 1915 he was offered a position of Judge of the territory that was formerly German New Guinea, but declined the offer because of the climatic conditions. He accompanied the then Prime Minister (Mr. W. M. Hughes) and other delegates from Australia to the London Conference as legal representative in 1916. On returning he resumed his former position, having to a breakdown in health, he retired three or four years ago, under the provisions of the Federal Superannuation Act, and settled at Mount Lofty. He was interested in his attention to duty throughout his period of service with the Federal Government, and gained the respect and confidence of his superior officers by reason of his outstanding ability. He was married to Miss Nelly Weir, daughter of Mr. J. R. Weir, of Camberwell (Vic.). The widow and a son survive.