The Science Congress.

A Chair of Anthropology Suggested.

Afternoon Devoted to Excursions.

General Council Meeting Held.

The sessions of the Australasian Association for the Advancement of Science were continued at the University on Wednesday. The meeting of the Agricultural Section attracted most attention. Before it Professor Watt, of Sydney, read a paper on "The World's Food Supply." The meeting of the Agricultural Section was devoted to a meeting of the council, but the majority of the delegates took part in the various excursions to industrial establishments. The afternoon was devoted to of the council, was to request the Commonwealth Government to establish a Chair of Anthropology at an Australian University. The most important decision

Delegates to the Adelaide meeting of the Australasian Association for the Advancement of Science were early astir yesterday, and quickly got to work in the different sections allotted to the University. There were, as in many presidential addresses are wont, but the subjects were of intense interest. Papers on scientific subjects were read by specialists, and many suggestions bearing for their object the welfare of humanity generally were made. One of the most striking of the papers was that by Professor Watt, of Sydney, who outlined the position of the world's food supplies, and set forth possible salvation [illegible] as he of as most people supposed, was not so far off as most people supposed. The question of conserving the existing sources for providing supplies and dealing with future requirements of humanity, in view of the fact that the area of land available for cultivation was limited, and the fact that the population was increasing, was one which could only be dealt with by the nations, supported by the world in its entirety. Closely associated with the work of the [illegible] was the address by Professor Watt was the plea for some arrangement for agricultural research also presided by Mr. W. L. Chilcott and Mr. R. C. Scott. They contended that an agricultural education institute similar to that in existence in Canada should be established in Australia, and considered that had the Federal Bureau of Agriculture been allowed to materialise, that body would have been the proper authority to undertake the coordination and standardisation of experimental work which was so necessary. On the subject of health Dr. D. G. Robertson (Director of the Commonwealth Bureau of Industrial Hygiene) stressed the importance of industrial hygiene, of which he is an enthusiastic advocate, and of the prevention of disease. Valuable papers on other matters for instance papers on the Dalton plan of co-operative educational work, and the teaching of Australian history and the teaching of Australian [illegible] were also presented. The results of the study of the water requirements of crops were detailed in a paper read by Mr. W. S. Richardson. The necessity for the establishment of a trade department, free from political control was advocated by Mr. Norman Taylor (president of the National Roads Association). Delegates expressed admiration at the decision of Professor Walter Baldwin Spencer, who had resigned the presidency of the council to visit by the suggestion of Professor Walter Baldwin Spencer, and a resolution urging the establishment of a chair of anthropology in Australia for the immediate study of the native race of Australia and contiguous territories. Whilst the council was sitting a very large number of delegates and visitors engaged in excursions to the city in a fleet of motor cars. Others visited various local industrial establishments. The visitors expressed satisfaction with the arrangements made for their entertainment.

MEETING OF THE COUNCIL.

A CHANGE OF NAME SUGGESTED.

The usual meeting of the general council of the association was held on Wednesday afternoon, and was presided over for the president (Sir John Monash). The most important matter dealt with was a recommendation from the Ethnology and Anthropology section that the association should support the request of the Australian National Research Council and the American Universities for the establishment of a Chair of Anthropology in Australia.

After a long discussion, the council decided to support the recommendation and to transmit their resolution to the Prime Minister (Mr. Bruce).

The chairman extended a hearty welcome to Professor Grafton Elliot Smith, of the Sydney University, which was endorsed by acclamation.

The question of changing the name of the association so as to include that of the Australian and New Zealand Association was raised by a New Zealand delegate, who said he was here at the request of the New Zealand Department of Internal Affairs. He proposed no resolution for his request, but if a precedent could be produced it was his intention to move that the New Zealand remembered by the association was lost in the present title. The council decided not to alter the name, but it was agreed that the words Australasia and New Zealand inscribed on the back of the present title.

The question of the printing of 1,000 copies of the index to volumes 1 to 10 of the proceedings of the association and establishing a central office in Sydney, with a permanent paid secretary, were referred to a committee consisting of the president (Sir John Monash), Sir Baldwin Spencer, Sir George Kelaby, and the secretary (Mr. R. C. Andrews).

BEEFINE
The Pioneer Hand Bodyer
Improves flavor and nourishment of soups, gravies, &c.

LAND'S SUCCESS.
the Ashes Were Won.
THAT THE CAPTAIN OF THE ENGLISH TEAM SAYS.
July 7, 1924.
QUANNA SALVE
athlete in that branch of sport, football, which requires a call upon reserves of energy to the utmost, feel obliged to make a few remarks relative to the wonderful curative of your splendid salve, and ask you this unsolicited testimonial with sincere good it has done me in my operations. I found it most useful in penetrating to the weak spots, the muscles that eliminate themselves and by my team to the gruelling test of muscle endurance great merit is due to Quanna the part it took in helping our team the much coveted ashes. I shall go I shall carry a Quanna Salve, and will never travelling it.
Yours faithfully,
JONATHAN PARKIN,
Captain British Football Team.
Chemists and Stores
Post free, from the Manufacturer, Maxwell, Brisbane.
Agent Mr. H. Tree, Williams-street, Adelaide.

TRANSPORTATION.

ROADS AND THEIR DEVELOPMENT.

A separate Roads Department, free from political control, is said to be necessary for the proper development of the roads of the country.

Mr. Norman H. Taylor, Federal president of the National Roads Association, read an interesting paper to the engineering section on the subject of Roads and their Development in Relation to Modern Traffic. Transportation, someone had said, had been the ladder upon which humanity climbed from a condition of primitive life to that of a finely wrought and complex civilisation. Roads were the arteries of Empire through which its life throbbed and coursed. In spite of years of discussion they had made no real progress with this idea. It achieved it would encourage closer intercourse between the peoples of the empire, and it would enable the produce of each country inside the empire to reach the markets of the other countries in less time, and at less cost than was possible to-day. A new interest in roads had been made necessary by increased motor traffic, starting out as a plaything, transformed into a luxury, and then becoming in turn a unique element in the standard of living, the motor vehicle had assumed the role of a highly efficient factor in transportation, fostering the lives and promoting the welfare of America as few developments in the history of any nation had done. A man who had been called the English Ford, the maker of one of the English cars, was asked the other day whether he saw an end to the present rapid production of motor cars. He replied that that day would never come. "I contemplate anticipate," he added, "the time when it will seem the most ordinary thing in the world for the British workman to have his own car."

The awakening of a great public demand for better highways was not confined to Australia. The whole of the civilised world, and much of it that they were prone to regard as uncivilised, was tackling the problem with as much vigor as ourselves, if not more. The reason for this movement in Australia was not far to seek. Probably the greatest curse from which Australia suffered was centralisation. They got most of their wealth from primary production, yet more than half of their very small population lived in the five capital cities. One of the greatest questions exercising the minds of the statesmen of to-day was how to place and keep a greater population on the land. The National Roads Association thought the solution lay very largely in providing good roads, so that in fair weather as well as foul people could get to their home towns. Australia was spending as much per head of its population as most other nations, but her needs in view of her scattered population and vast distances, were greater. She could afford to spend a good deal more. What had been spent up to now was only a small portion of what she could and ought to disburse. They borrowed millions to build railways, to which there could be no objection. Surely it was just as desirable, just as necessary, just as moral, to borrow millions to build permanent roads (as all roads as permanent as were railways) so that settlers could get their produce to the railway stations. It must not be forgotten that all their primary products on their genesis and exodus on the roads. Bad roads depreciated the value and earning power of the railways, good roads enhanced their value and usefulness.

Mr. Taylor dealt interestingly with the various experiments now being made in road-making, and said he did not pretend to make in the distant country could be constructed either of cement or bitumen. [illegible] and subsidiary roads, should be so constructed to ensure not only comfort but economy. No roads should be built without an adequate sum being set aside for their maintenance. Too often roads were built and wholly destroyed. Railways had gangers every few miles, why not roads? A great many of their roads were much too narrow, especially those leading to populous suburbs or watering places, and the rail was urgent and insistent that they should be widened at once. Many of their important roads were overcrowded now, especially those with double lines of tramways. So important were roads to development, and so great was the problem that he felt strongly that nothing entirely satisfactory could be done until they had a separate Roads Department, free from political control, with a commissioner at its head, with the same power as the Railways Commissioner had today.

Three sources of revenue were open—The direct taxation of all road users (pedestrians excepted), a certain grant from all municipal and district councils for being relieved of all responsibility in regard to main or arterial roads, or a grant from the Government, to which all would subscribe, for increased facilities of transportation. This would cheapen goods, and so benefit the whole community.

AGRICULTURE.

RESEARCH NECESSARY.

In Great Britain much has been achieved by the Agricultural Education Association, and the time seems ripe for the formation of an analogous body in Australia.

In a paper prepared by Mr. W. J. Colebatch and Mr. R. C. Scott, and read in the agricultural and forestry section the writers stated that in the Commonwealth there was an ever-increasing number of young men trained in agricultural science, many of whom were being called upon to conduct field and laboratory enquiries into questions of fundamental importance to practical agriculture; and, inasmuch as agricultural production and rural development would in the future turn largely on the results of their labors, the furtherance of their efforts by every possible means became a matter of national concern. The responsibility in this rested mainly upon the shoulders of the Federal and State Governments. To them was entrusted the framing of an agricultural policy, and on their sagacious foresight to which the agricultural problems of Australia was intertwined in the near future. Their wholehearted sympathy and practical support were vital to the extension, systematic enquiries already instituted, and search in Australia had as yet hardly shed its swaddling clothes the idea for liberal assistance and fostering care only those in authority would be recognised and fostered and opportune. The field research fell on the political powers, however, but there were undoubtedly obligations of a non-political order to be discharged by the departments, institutions, and educational bodies that were charged with the elucidation of these problems and the dissemination of agricultural truths and findings. It was to this subject that earnest thought should be given. Were they, even at the present time, organising their activities and exploiting their opportunities to the limit of their powers? Was it not possible for improvements to be effected in regard to standardisation and coordination by co-operative efforts and combination?

It appeared to the writers that very little had been done as yet to overcome the disadvantages that were an inevitable corollary to the intervention of wide stretches of space and time between groups and individuals. The stimulus of collaboration, the inspiration and encouragement arising from discussion and enthusiasm engendered by intimate knowledge of the ambitions and objects of others, were felt in minor degree only, if at all, under present circumstances. In Great Britain much had been achieved by the Agricultural Education Association along the lines indicated, and the time seemed ripe for the formation of an analogous body in Australia. Amongst the several functions which it would be expected to discharge might be mentioned the classification and publication in an annual volume of all forms of experimental work, field and laboratory, having a bearing on agriculture in Australia.

Hitherto they had been able to glean a little knowledge of the progress being made in different centres from the pages of the departmental publications, but there was a vast amount of work carried out that was of little direct value to the farmer, and in consequence did not appear in print. This work, however, might be of engrossing interest to other investigators, and consequently it was eminently desirable that progress reports giving complete records of the whole of the work undertaken each year should be brought together in an annual reference volume. Had the dream of a Federal Bureau of Agriculture been allowed to materialise, that body would have been the proper authority to undertake the coordination and standardisation of experimental work which was so necessary. On the subject of health Dr. D. G. Robertson (Director of the Commonwealth Bureau of Industrial Hygiene) stressed the importance of industrial hygiene, of which he is an enthusiastic advocate, and of the prevention of disease. Valuable papers on other matters for instance papers on the Dalton plan of co-operative educational work, and the teaching of Australian history and the teaching of Australian [illegible] were also presented. The results of the study of the water requirements of crops were detailed in a paper read by Mr. W. S. Richardson. The necessity for the establishment of a trade department, free from political control was advocated by Mr. Norman Taylor (president of the National Roads Association). Delegates expressed admiration at the decision of Professor Walter Baldwin Spencer, who had resigned the presidency of the council to visit by the suggestion of Professor Walter Baldwin Spencer, and a resolution urging the establishment of a chair of anthropology in Australia for the immediate study of the native race of Australia and contiguous territories. Whilst the council was sitting a very large number of delegates and visitors engaged in excursions to the city in a fleet of motor cars. Others visited various local industrial establishments. The visitors expressed satisfaction with the arrangements made for their entertainment.

WORLD'S FOOD SUPPLY.

SOUTH AUSTRALIA'S PRE-EMINENCE.

The most effective means of preventing a world's bread shortage is to give encouragement to scientific research and investigation, says Professor Watt.

The problems of the world's food supply formed the subject of a presidential address to the agriculture and forestry section by Professor R. D. Watt, of Sydney. In a country like Australia, he said, where they grew food products far in excess of their own requirements, and especially in South Australia, which produced more wheat per head of the population than any other State of the Commonwealth or any country in the world, it might come as a surprise to many that the food supply of the world should give any concern either at the present time or in the future. They had been hearing in recent months of the possible exhaustion within a limited time of many of their sources of power, and of an approaching world shortage of some of the metals and of timber, but only occasionally did they find public men drawing attention to a still more serious possibility, namely, a world's food famine. There were many potential sources of power, and there were many substitutes for metals and timber, for certain classes of work at least, but there was only one source of food, and the area on which it could be grown was definitely limited.

The Synthetic Chemist.

No one could tell what the synthetic chemist of the future might do in the way of food production, but at present they were absolutely dependent on the greatest synthetic chemist of the universe, namely, the green plant, which alone could, under the influence of solar energy, build up those complex organic compounds (carbohydrates, proteins, and fats) which were capable of nourishing mankind from such simple substances as carbon-dioxide, water, nitrates, and phosphates. Man depended entirely for his nutrition on such products. It was estimated that the numbers of the human race had approximately doubled during the last 100 years, and the rate of increase in population had been greater during that period than at any previous time in history. This rapid growth had only been made possible by the application of science to transportation, to medicine and surgery, to food production, and to many other phases of human activity.

As recently as the eighteenth century each country, and, indeed, each local community, was more or less self-supporting in the matter of food supply, and depended on adventurers, who braved the ocean and its perils for only a few of the minor luxuries. Today, owing to safe and rapid transit by land and sea, to refrigeration, dehydration, and other modern developments, the resident of any advanced country had at his whole world for his farm. The present population of the world was over 1,800 millions, and was increasing at the rate of approximately 1 per cent. per annum. That might seem a very moderate increase, but it meant that 18 million people, or more than three times the population of Australia, were added to the world's dinner table annually, and the addition got greater year by year. The total area of the globe, 33 million acres, seemed large, but they could not utilise all the area for growing crops. The areas available for agriculture totalled about 13 million acres. Of this potential world farm about 5,000 million acres were now being cared for by the hand of man. According to the calculation of 3.5 acres per person the maximum population the earth could support was a little over 3,000 millions. At the present rate of increase the time was not so far distant, but that was none of their grandchildren would live to see it.

Anxiety Concerning Food.

Until such time as Russia had a supplier again it looked as if Europe would have to depend mainly on Canada, the Argentine, and Australia for her imports of wheat, and as these three countries were all rather subject to climatic vicissitudes, and dependent upon a variety of circumstances for their rate of development, there was likely to be at times a good deal of anxiety and a somewhat nervous market in the near future. The carry-over from last wheat year, which ended on August 1, was quite considerable, but in spite of that the reports of damage by drought and by rust in the Canadian crop had recently caused a sudden rise in wheat prices. The harvest returns from the Northern Hemisphere were usually copious of high coupons. In such localities the water requirements of crops had necessarily to be high as that crops were likely to suffer from the double disadvantage of shortage of rainfall high transpiration rate, and a knowledge of the rate of evaporation from a free water surface was there as important as a knowledge of rainfall in determining the suitability of arid lands for settlement. Many of the factors influencing the economy of water used by plants which had been commonly regarded as greatly influencing the transpiration rate in such were rather factors in plant nutrition.

Any factors which caused malnutrition resulted in a relatively high water requirement within production of dry matter because of the continued use of water without a normal increase in dry matter. Transpiration appeared to be a purely physical phenomenon depending primarily on the evaporating power of the atmosphere, but it could be modified to a considerable degree by the variety of the crop, fertility of the soil, application of soluble phosphates, and controlling the water supply. The varieties of wheat tested showed a wide variation in the transpiration ratio, this variation in the breeding of wheat varieties for arid districts. The proportion of straw to straw was a factor of importance in the creation of wheats for arid districts, for that determined whether the variety would utilise the scanty water supplies economically in the production of grain.

Suitable Fertilisers.

The application of soluble phosphates was found to produce a marked lowering effect on the water requirement of wheat. The effect of a suitable fertiliser in aiding the plant to economise water supplies was an important factor in relation to the control of the transpiration ratio. Any factors which aided the more perfect development of a wheat crop—well tilled soil, use of appropriate fertiliser, supply of conserved moisture, and seeding of the crop under favorable conditions enabled wheat to produce grain at a minimum water cost. The production of new wheat varieties to meet the requirements of a low transpiration rate opened up a field of vast possibilities. Earliness of maturity and high migration rate were of great importance in the production of wheats for arid localities. With evolution of harder strains with low water requirements, new territories might be colonised and the utilisation of existing areas may be made more effective.

Tests made in Victoria showed that the transpiration ratio for wheat was lowest during the early stages and progressed increased as the wheat approached the ripening stage. During the final stages the transpiration ratio was three to four times as high as that of the earlier stages. This showed the need of early maturing varieties in hot dry areas of the wheat belt where the ripening period was excessively rapid. Recent investigations in Victoria showed that the mineral nutrients were taken in rapidly in the early stages, and the bulk of the water used in the final stages of the growth of the crop. Thus it was found that in the middle of September wheat crops had taken in over 80 per cent. of their mineral requirements, though they had formed only 27 per cent. of their total dry matter and had taken up only 18 per cent. of their total water supply.

These results showed the necessity of having an abundance of soluble food constituents in the soil at seeding time, either by the application of fertilisers or by the thorough preparation of the seed-bed.

The results of the study of the water requirements of crops and the relationship between rainfall and wheat yield, confirmed by the results obtained by the best wheatgrowers in the Wimmera, enabled him to affirm, with some degree of confidence that the average yield of the wheat belt of Victoria could be at least doubled before the limits imposed by the rainfall were approached.

FODDER VALUES.

IMPORTANCE OF PROTEINS.

Too little attention is given to the feeding value of fodder in Australia, declared Messrs. Jefferis and Piper.

Messrs. A. T. Jefferis, B.Sc., State Agricultural Chemist and C. S. Piper, B.Sc., assistant chemist, presented a paper on the value of some South Australian oats and other fodder. The paper stated that little attention had been given to the feeding value of fodder in Australia. At Roseworthy College, in the last two years, considerable work had been done in order to gain knowledge of crops profitable to grow in respect to quality as well as yield. Mr. Colebatch, principal of the college, had introduced thirteen varieties of oats to discover one which would provide green feed in winter as well as hay and grain. Tables giving the analysis of ensilage, hay, ripe plant, straw, and grain of these thirteen for 1922 and 1923 were shown, but owing to the great seasonal variation, a comparative table of the results could only be obtained when several years work. An examination of the average analysis for all varieties in each season was, however, very instructive as the percentages of proteins at all stages were much less in 1923 than in 1922, particularly in the hay which fell from 10.6 to 2.6 per cent. The composition of Indian grass at several stages was shown, and it was seen to contain over 10 per cent. proteins when in flower, more than double the amount in last season's oaten hay.

Berseem Clover, introduced by Professor Perkins from Egypt, provided 30 tons of green feed per acre per season. It was comparatively high in proteins, and a useful legume when, during the winter, others such as lucern were at a standstill. Tables comparing the composition of shrivelled grains of wheat, oats, and barley with plump grains showed the latter to be higher in proteins and fats, and therefore, provided the digestibility of screenings compared favorably with the plump grain, farmers were making a mistake in selling them at a low price and retaining good grain for feed. With regard to food values in general, as applied to Australian conditions, insufficient stress was laid on the importance of proteins.

Farmers in the Gawler district had explained that last season's hay would keep their horses in condition, whereas that of 1922 was excellent. The proteins were only one-half as high in the 1922 hay, giving a nutritive ratio of 1 to 6, against 1 to 11. On the starch equivalent basis last season's hay was somewhat higher in value, whereas in actual practice, it was greatly inferior. There was no doubt whatever that the lack of proteins in this hay, owing to the exceptionally wet season, had caused the deficiency, and no amount of crushed oats of the same harvest could bring the ratio to the required nutritive value. In compounding of rations and balancing mixtures, fodder with high protein contents such as lucern hay, bean, peas, and oil cake concentrates such as linseed meal, might be found necessary. Hand-feeding of stock was in the ascendancy throughout Australia, particularly during the colder months when natural pasture was scarce, and as the pastoral industry was constituted to be worth some £70,000,000 per annum, there was scope for very valuable work in the laboratory and feeding pen.

PEA-GROWING.

VALUABLE ROTATION CROP.

There are great possibilities in parts of this State for pea-growing in rotation with wheat.

Mr. W. S. Kelly, chairman of the Advisory Board of Agriculture, speaking before the agricultural section, said they were all seeking a system of rotation cropping that would help them to maintain the fertility of soils and add to the stock-carrying capacity of farms. Many systems were being tried. Some with the aid of clover or lucern were very suitable for rough or distant country. But small farms of good agricultural land must be farmed under a rotation that would make it possible to grow wheat frequently. Peas could in a 20-inch rainfall be rotated with wheat so that wheat could be grown every second, third, or fourth year, in accordance with what rotation was adopted.

It was difficult to be certain as to yields, but it seemed reasonable to assume that the yields would equal in bushels the yield of wheat crops. They should be able to reap 15 to 30 bushels per acre. If this were fed to the hood it would greatly add to the carrying capacity of the farm. Peas were very high in albuminoids, their content being nearly 20 per cent. of this essential property. Considering its weight and its richness a bag of peas was worth nearly as much as three bags of oats.

Peas seemed to require at least 15-inch rainfall. The land should be fallowed after harvest, worked down with the first rain, cultivated just prior to seeding, and sown immediately after seeding. The peas should be sown by the end of June. Harvesting was now simple, because of the machinery which would handle peas as well as wheat. One man could now reap from 50 to 100 bags per day. Many people contested the point of success of the subsequent wheat crop. This was determined largely by the moisture available. Peas would rob the soil of some moisture. Therefore it was essential that the rainfall be adequate. On the best agricultural areas large quantities of peas could be grown. This would greatly increase the stock-carrying capacity of farms. At the same time wheat yields need not suffer.

PUBLIC HEALTH.

INCREASED HUMAN EFFICIENCY

The chief value of industrial medicine, says Dr. D. G. Robertson, lies in its potentiality for preventing disease.

Dr. D. G. Robertson (director of the Commonwealth Division of Industrial Hygiene) in a paper read before the Sanitary Science and Hygiene section, stated that there were sound reasons why industry should bear its share in raising the country's standard of health. Industrial medicine afforded a way as it was well within the power of employers to ensure a high standard of health within their own organisations.

He said the chief value of industrial medicine lay in its potentiality for preventing disease. It offered the following benefits:—A decrease in the number and length of absence of employes due to injury and disease, a decreased turnover in factory labor, increased earnings for the worker, and increased production for the employer. The National Cash Register Company of America, had, by an efficient medical department, reduced the sickness of their employes from nine days to 131 hours for each employe a year. Dr. Robertson said public health not only postponed mortality and prevented sickness, but furthered the positive side of health by increasing the vitality, capacity, and efficiency of the human body. That was accomplished by supervision of the individual. Industrial medicine afforded an economical means of supervising large groups of individuals. The sickness of the industrial worker caused a huge financial loss yearly.

In certain Government departments it had been found that on every working-day at least two per cent. of the employes were absent through sickness due largely to preventable causes. For the financial year ended June 30, 1923, the salaries of permanent officers of the Commonwealth Public Service amounted to £6,000,000, and of that sum £132,000 represented sick pay. In increasing numbers Australian employers were instituting some system of medical service, which in the case of the Australian Gas Light Company, employed 14 medicals, and in some cases for a staff of less than 500 employes. It was essential that employers should set before themselves clearly the work a medical service should do, and how that work should be undertaken.

Value of Expert Advice.

As a first step the industrial physician should become familiar with the plant. He should possess a working knowledge of the principles of lighting and ventilation, and be familiar with the effects of the common industrial poisons. He should report to the management conditions he considered potentially detrimental to health and comfort. Prompt and proper treatment should be available for all injuries, and employes should be compelled to report immediately all injuries, no matter how trivial. Medical attention should be confined to minor ailments, other cases being referred to the family physician, but it should be made a working rule of the establishment that every employe becoming sick during working hours should report to the medical department before going home.

If examinations of applicants for employment were required they should be held not for the purpose of rejecting the physically unfit, but to prevent persons being placed in occupations in which they were likely to be dangerous to themselves, to others, or to property, or where they could not reasonably prove efficient.

The prevention of the spread of infectious diseases such as the common cold was an important duty of the medical department. Australian employers were now recognising the importance of dental hygiene by offering dental attention.

Accurate records of the work performed in the medical department and of the sickness among employes should be kept. In the ability to reduce the amount of sickness below the general or accepted average lay the test of the industrial physician or nurse. As the medical department was placed in touch with the employes throughout the whole organisation, excellent opportunities were afforded for instructing the workers by personal advice on healthy habits of living. The accumulation required by the medical department depended upon certain factors, but generally speaking, a surgery, consulting room, and rest-room were necessary. The industrial canteen was a valuable adjunct to medical services, and Australian employers were setting a high standard in that respect.

WARNS WOMEN AGAINST USE OF SOAP ON HAIR.
Nearly all soaps and ready-mixed shampoos even the most expensive contain free caustic alkali, which is dangerous, as it dries the scalp and makes the hair brittle.
Simply the most elegant and safe thing to use is ordinary extracted coconut oil (not the commercial, but quite genuine stuff, which is not at all expensive, but far better than soaps or other scalp preparations). Every chemist keeps a supply of this, and a few ounces lasts you months. Your sisters and brothers, for instance, just wet the hair with water and rub it through—thoroughly. One or two teaspoonfuls is plenty to create a lather rich, heavy, creamy lather. It dissolves dandruff and removes it easily. The hair comes quickly and easily, and is left brilliant, soft, fluffy, wavy and much more in order, looking much thicker than it actually is.
Best of all, this extracted coconut oil is so pure and so easy to rinse away that you hadn't washed it at all. All the dirt, grime and germs of every kind, all traces of dust, dirt, or dandruff are gone.
IMPORTANT.—Do not confuse Cocoanut Oil with cheap and sticky stuff called coconut oil, or the commercial article, which is generally chemical in value. There is only one genuine Cocoanut Oil, wine-green, and is sold only by the International Chemists. Look for the maker's name on every bottle to ensure satisfaction.)

THE WHEAT CROP.

WATER REQUIREMENTS.

To produce a ton of grain, Dr. Richardson declares, 10½ in. of water is required to pass through the crop.

Dr. A. E. V. Richardson, M.A., D.Sc., Director of the Waite Institute of South Australia, in a paper read before the agricultural and forestry section, stated that the quantity of water used in the growth of farm crops was so considerable that the water supply of the soil was frequently a limiting factor in crop production. It had long been known that crops differed materially in their water requirements, but the results obtained in Victoria showed that climatic and soil conditions profoundly affected the amount of rain required by any given crop. These were matters of great scientific interest, and of great economic importance, especially in countries with a large area of relatively arid country. The water or rain transpired by the crop during the whole of its growth was measured and expressed in terms of the dry weight of the crop and grain produced. The result of six years of investigation in Victoria showed that winter-grown cereals under Australian conditions required more rain to produce a unit weight of crop than in England and Northern Europe, but much less than similar crops grown in the United States and India. For six years in Victoria the wheat crop required, apart from losses of moisture in the soil, approximately 4 inches of rain to mature a ton of dry matter, grain, and straw. To produce a ton of grain, 10½ inches of water was required to pass through the crop. Thus for moderate rainfalls every inch of rainfall was capable of producing 2½ bushels of wheat per acre—5½ bushels per inch of rain. The composite average winter rainfall—April to October—in the South Australian and Victorian wheat belt, was practically identical, namely 11½ inches. Assuming that the extra water conserved by fallowing would balance the losses of water by evaporation from the soil, the rainfall was sufficient to produce an average of 40 bushels per acre in each State. Less than one-third of that amount was actually being obtained, while with moderate rainfalls wheat would yield 2½ bushels for each inch of rain received during the growing period of the crop. Victorian wheatgrowers, as a whole, had obtained during the last few years only 1.1 bushels for each inch of winter rain, and the South Australian wheatgrowers 1.4 bushels per inch of winter rain. On the other hand, the whole of the wheat growers of the Wimmera had averaged during the last five years, 1.75 bushels of wheat per inch of rain, while in the Longerenong College farm and the competitors in the Wimmera farm competitions, an average yield of 2½ bushels had actually been obtained for each inch of winter rain received. The Longerenong College farm had actually obtained a yield of 40 bushels per acre over a 300-acre area during the past season.

Fluctuating Requirements.

The water requirements of wheat were not constant but fluctuated from season to season. High water requirements were associated with low rainfall, high temperature, strong winds, low atmospheric humidity, and intense evaporation during October and November. In Victoria over 60 per cent. of the water required by a crop was used up in October and November, though the growing period extended over seven months. A consistent relationship was found to exist between the transpiration ratio and the evaporation from a free water surface. In many parts of the wheat belt the evaporation rate was subject to great modification consequent from dry northerly winds during October. These winds, usually more frequent in dry seasons, greatly accelerated transpiration, and resulted in lowered crop yields. Regions of low annual rainfall were usually regions of high coupons.

THE NEXT MEETING.

TASMANIA PROPOSED.

At the meeting of the council the question of the venue of the nineteenth gathering, in January, 1926, which had been adjourned from Monday, to allow the Tasmanian delegates to ask their Government as to what financial support would be forthcoming, was again raised. The Tasmanian delegates (Professor D. B. Copland and Mr. S. Gillon) informed the council that they were not in a position to extend a definite invitation to the congress to meet in Tasmania in 1926, as they had not yet received a reply from their State Government. Professor Copland suggested that they had two possibilities before them. One was to defer the matter until the next meeting on Saturday morning, and the other formally to decide to hold the 1926 conference in Hobart, provided the Tasmanian delegates were in a position in a month's time to state that their Government had decided to guarantee a sum towards the conference. If the offer was not forthcoming then they would decide on another place at the end of that time.

Dr. J. S. Purdy suggested that the conference should be held at Canberra. The Commonwealth Government in the past had given the association great support, and by that time Canberra would be so far advanced as to afford sufficient accommodation.

Sir Baldwin Spencer asked if they were sure of that. He thought they owed a debt to Hobart. They had to cancel the 1920 meeting there owing to the shipping strike.

The permanent hon. secretary (Mr. R. C. Andrews) said an integral part of the success of the congress was found in the enthusiasm of the people in the places where it was held. Canberra had practically no population. The matter of meeting at country centres had been raised before, but those centres could not supply the necessary entertainment, hospitality, or accommodation, and that would rule out Canberra.

The council decided to adjourn the matter until the next council meeting on Saturday morning, and that in the meantime the Tasmanian delegates should again get in touch with their Government regarding the matter of finance.

GOVERNMENT WILL PROVIDE FUNDS.

Hobart, August 27.

When the delegates to the National Science Research Council offered the 1926 congress to Tasmania, representatives from this State said that unless they could secure the assistance of the Tasmanian Government they were not financially strong enough to invite the conference here. The Cabinet has agreed to bear the expense in connection with the Hobart conference, and the conference is to be held in Hobart in January, 1926.

FALLOWING.

MOISTURE CONSERVATION NOT ONLY BENEFIT.

That moisture conservation was not the only benefit of fallowing is the contention of Professor Paterson, of Perth. Fallowing conferred other benefits, any or all of which might contribute strongly to increased yields.

"Wheat and Fallowing" was the subject of a paper read by Professor John W. Paterson, B.Sc., Ph.D., of the University of Western Australia before the Agriculture and Forestry section. Professor Paterson put forward a strong plea for greater discernment in interpreting the benefits of fallowing. Thanks to the active propaganda work of departmental lecturers and writers, and the equally effective efforts of the agricultural press, the general advantages of fallowing were now widely appreciated. It was becoming apparent, however, that much of this propaganda work was too general in its treatment of the subject, in that it simply recorded instances of the increased yields from fallowing, elaborated at considerable length a description of cultural methods and their season of application, while it was too little analytical of the reasons leading up to the increased yields. Where reasons came into question it was more or less tacitly assumed that the improvement was due to moisture conservation. This was by no means always correct. For example, in 1923 the W.A. wheat belt had too much rain early in the growing season, and yet the crops on fallow always appeared stronger and healthier than those on dry-ploughed land. It was not contended that moisture conservation was unimportant—but it was not everything.

Fallowing conferred other benefits, any or all of which might contribute strongly to the increased yields. On the heavier soils, especially, it would by the action of time and judicious cultivation lead to flocculation of the finer soil particles, and thereby improve the mechanical condition of the soil. Again, by spreading the work of the farm it gave more time to plough properly and without scamping—a special advantage on the heavier soils. Further, it helped efficiently to kill weeds, a feature of special import in the older districts. Finally, it assisted powerfully in providing within the soil a supply of nitrates ready for the next crop. Nitrate supply might frequently be the principal cause of improved yields from fallow.

With Mr. P. R. Scott, of the Victorian Department, he had in 1917 ascertained that a good fallow at Geelong was able to prepare 148 lb. of nitrate nitrogen per acre, as compared to 22 lb. on land which had been under crop the previous season. This difference of nitrates in favor of fallow would become still greater in districts with either sparse or no summer rains. Where crop had to be seeded on dry-ploughed land, and especially under good winter rainfalls, 30 to 50 lb. of phate of ammonia might be added to the superphosphate dressing.

Professor Paterson claimed that the gross benefit of fallowing was a composite result of various soil improvements effected by cultivation and rest. In no case would the improved yield be due solely to moisture conservation, improvement of soil texture, killing weeds, or to nitrate production, but the relative importance of these would vary with each particular district and season. Insistence on the general benefits of fallowing without specific reference to the reasons was unscientific. It conveyed no intelligent information to the farmer, and might even deter him from sowing unfallowed land for no better reason than that he had been advised against it.

SOILS OF THE SOUTH-EAST.

HOW THEY SHOULD BE TREATED.

An interesting review of certain soils of the South-East of South Australia was given in a paper read by Professor L. J. Cook, in the agriculture and forestry section. He said a large proportion of Kybybolite soils was cemented ironstone, approximately 1 ft. deep, over yellow clay subsoil. The clay was very stiff, and its surface irregular with the stiff, and in the surface, hence there was poor of the soil surface, hence there was poor under-drainage. In a virgin state this and gave acid reaction, but the subsoil was alkaline. Continuous cultivation without manuring tended to increase acidity, and continuous cultivation with applications of superphosphate or crushed rock phosphate tended to increase acidity. Good hard-fallow, variously fertilised with phosphate showed acid reaction. Improved pastures showed no improvement from fallow only, showed no improvement from fallow only, showed acid reaction. The land had gone alkaline reaction. The average rainfall was 22.61 in., with comparatively heavy winter rains. The soil saturated quickly, and dried out hard, hence the period in which soil was in good mechanical condition was often very short. One ton of agricultural lime per acre would maintain soil sweet for at least years. Smaller applications gave much slower results. Crops, grass, and clover, on limed areas, started growth earlier, grew more quickly, were less affected by saturation, and recovered from wet periods quickly than on unlimed areas. Liming had increased the organic content of the soil. Superphosphate gave no response, and was considerably less effective than lime. Lime was not a cure-all, but was a valuable adjunct to the farmer, and might even overcome the effects of a single application of lime. It