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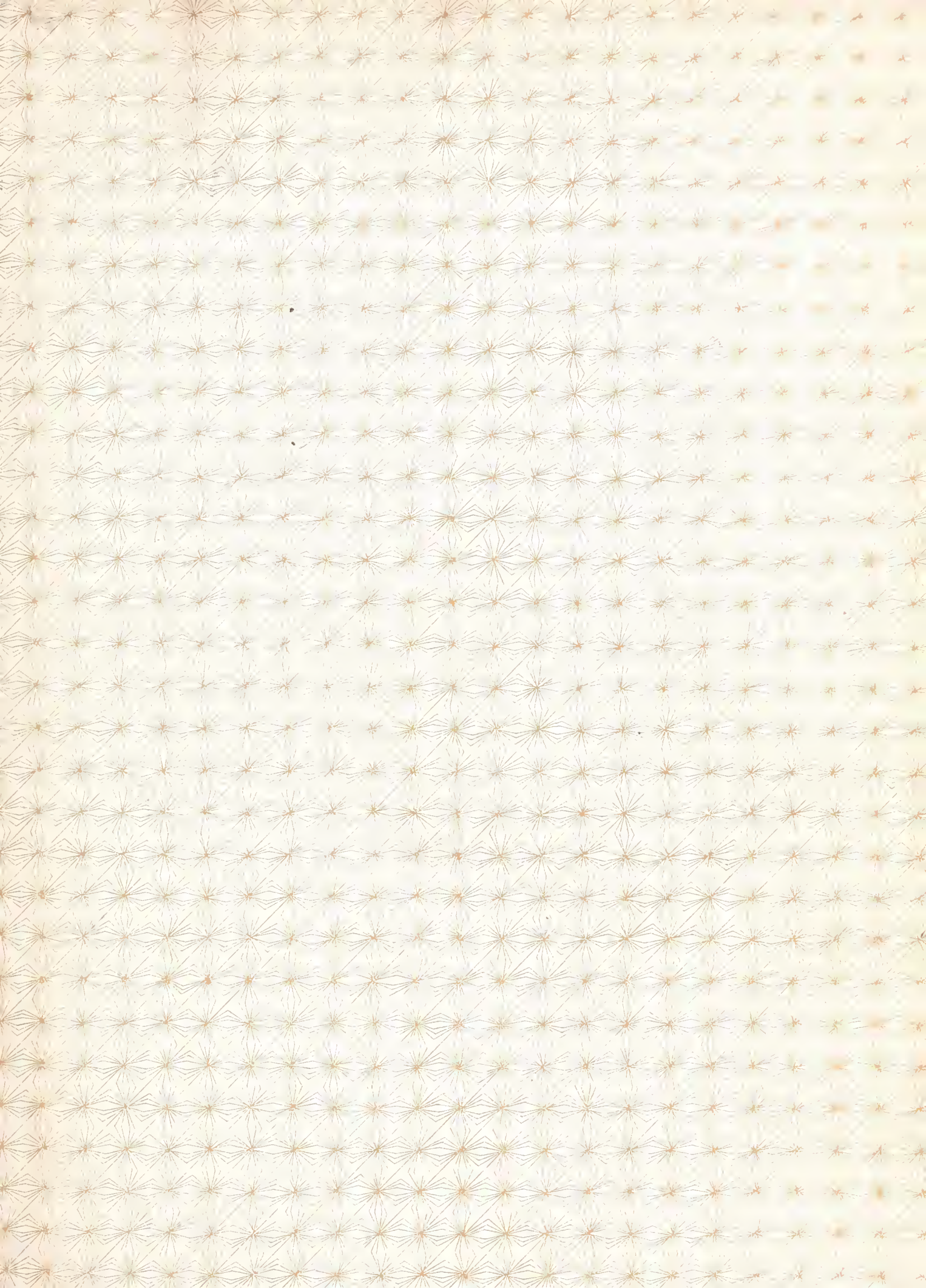
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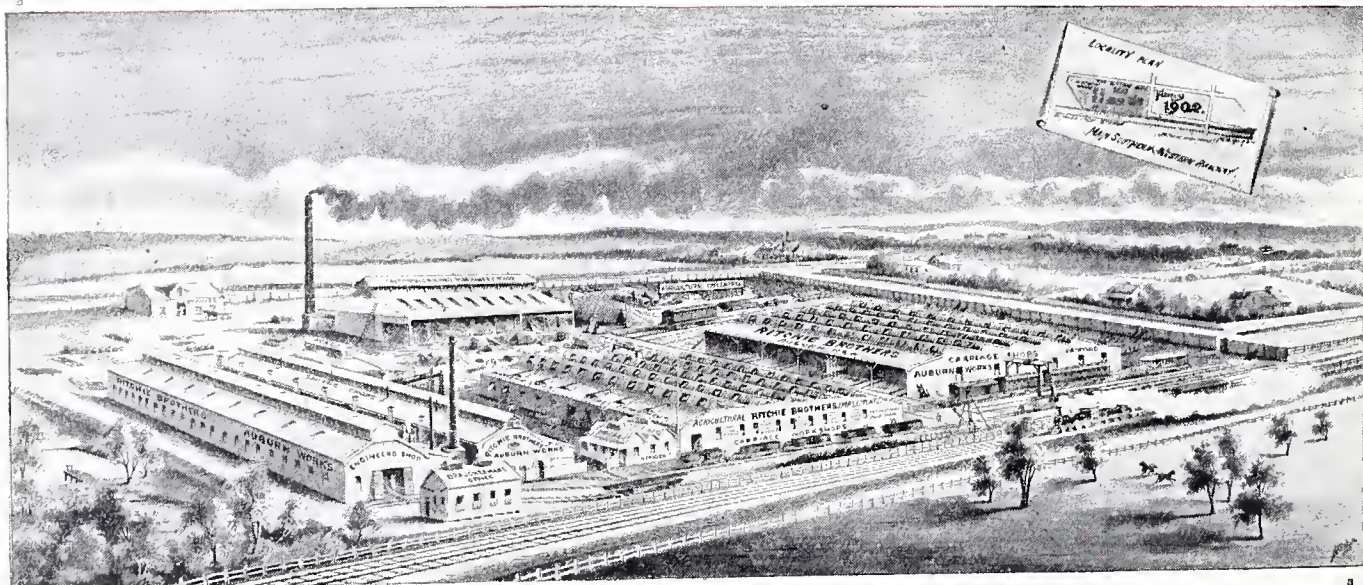
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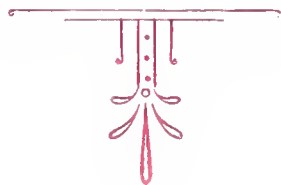
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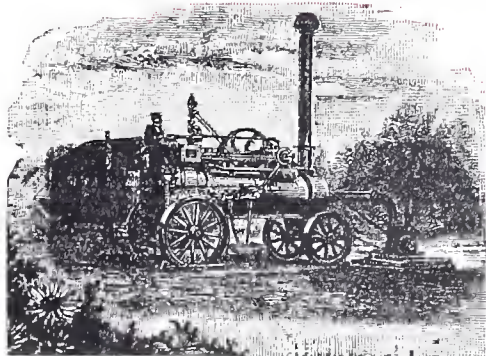
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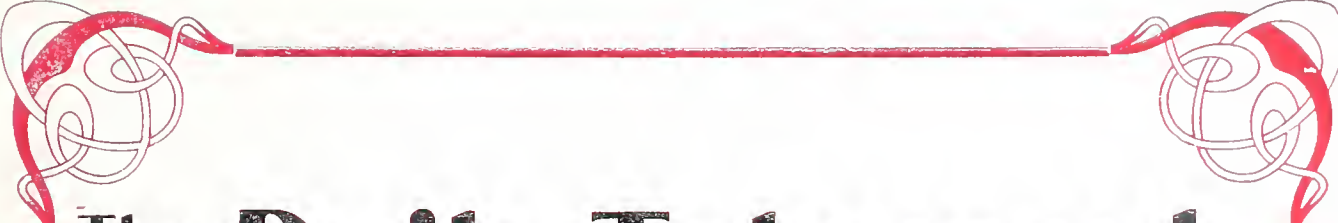


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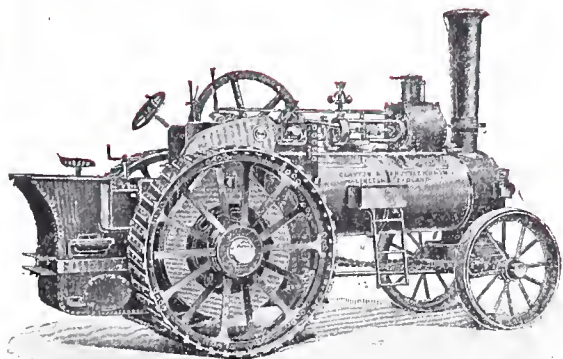
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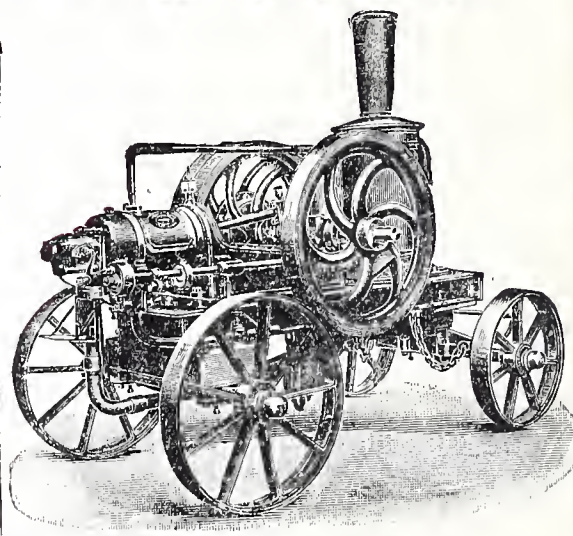
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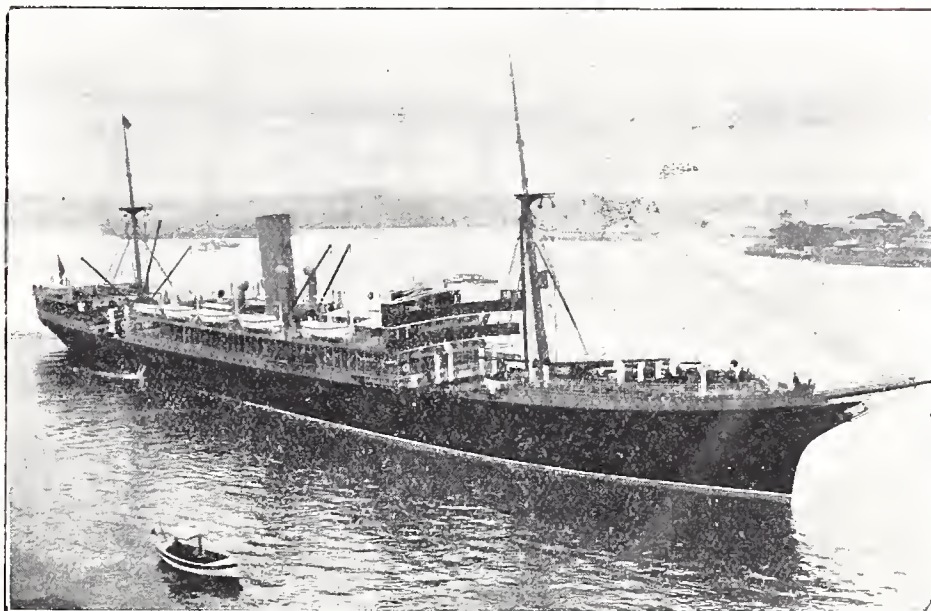
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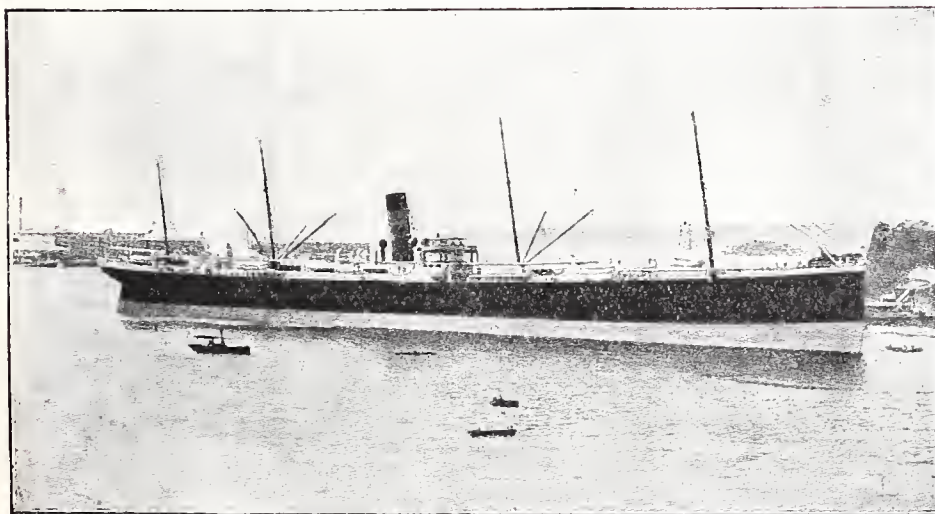
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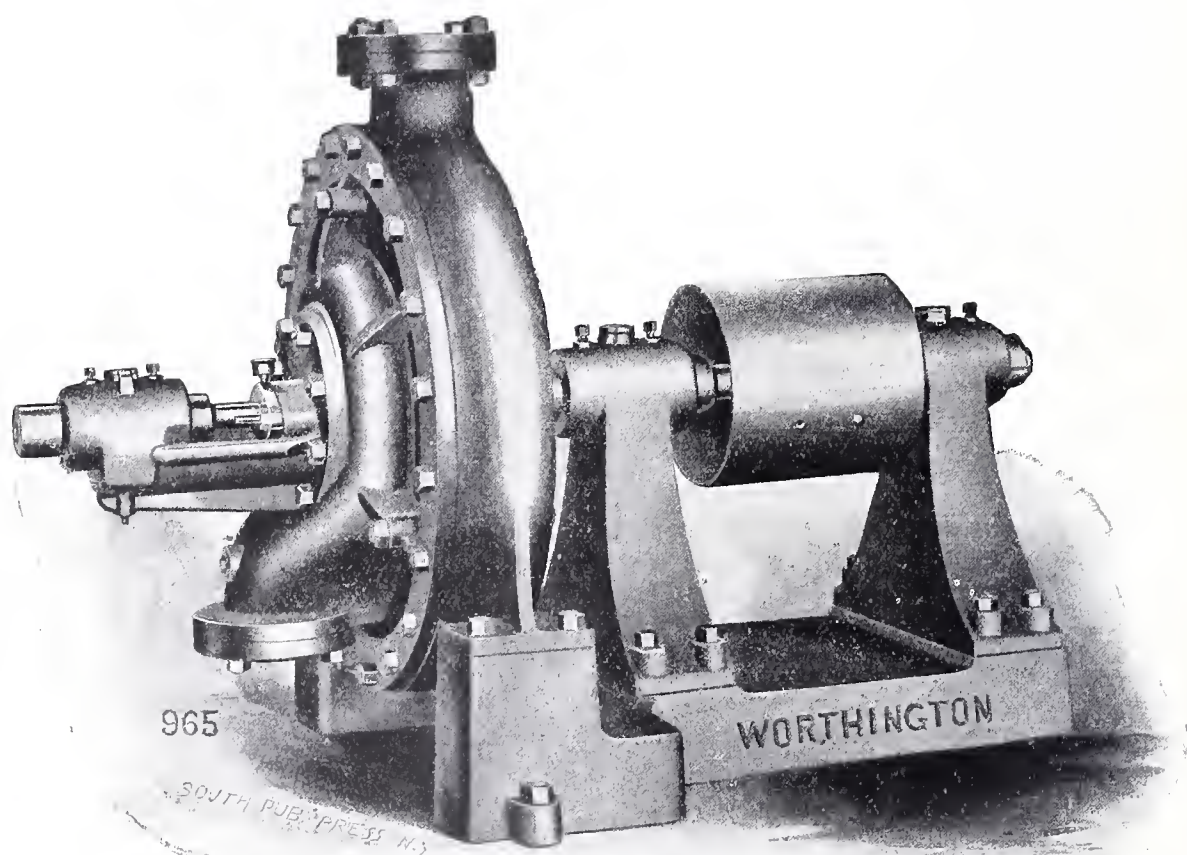


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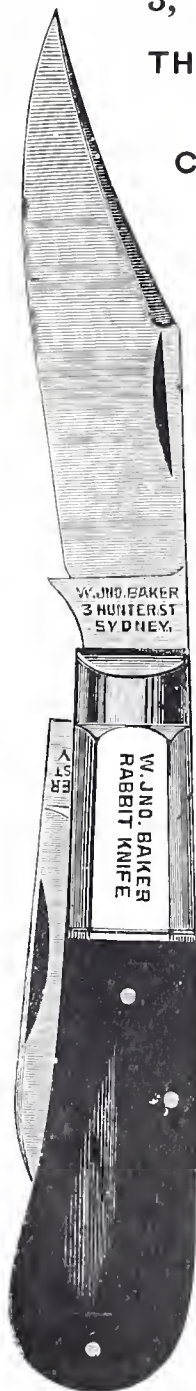
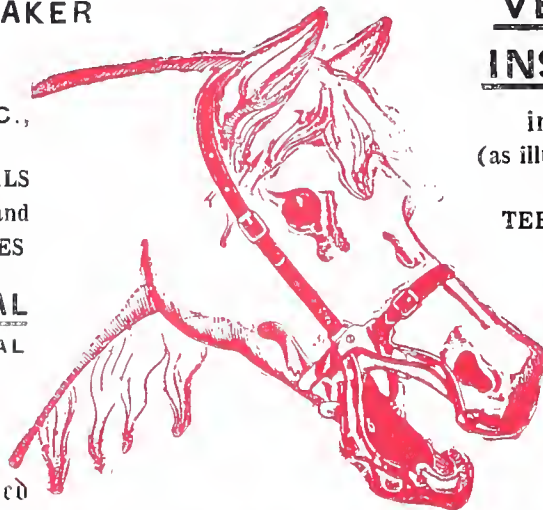
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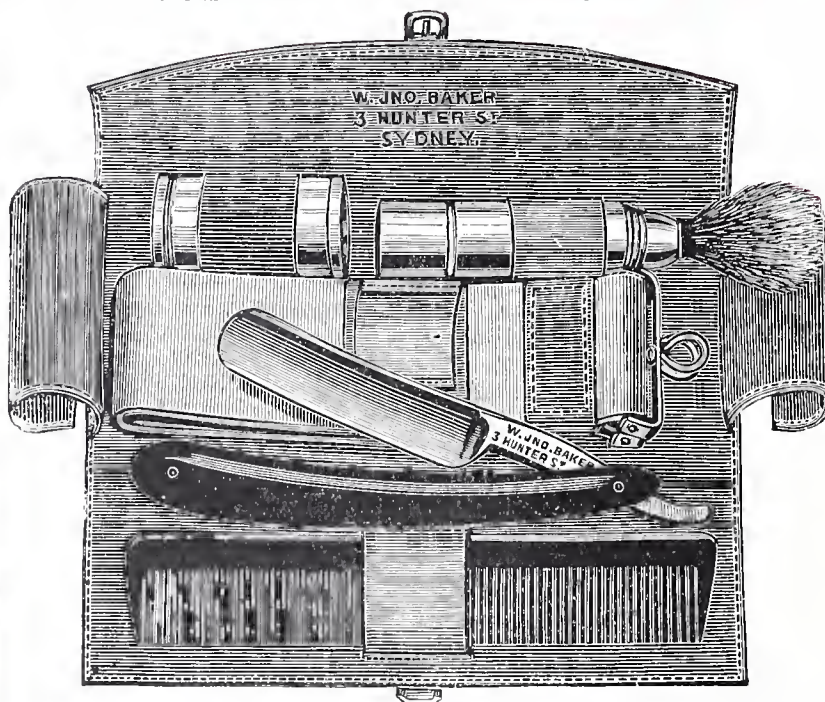
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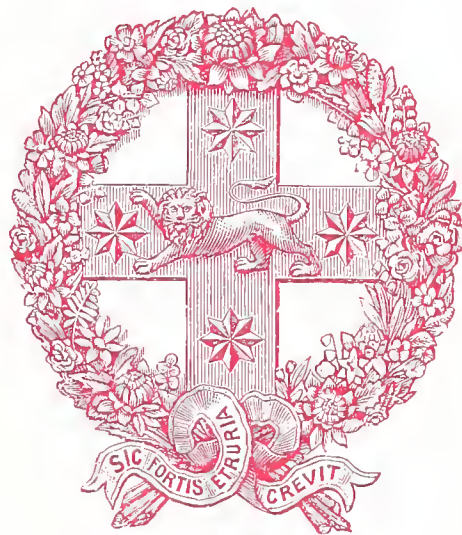


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AGENCIES IN ALL TOWNS.

Preface

2.5.R.
N. S. Wales

SHORTLY after the formation of the Intelligence Department, acting on the general instructions of the Premier (Hon. J. H. CARRUTHERS, M.L.A.), I planned a work which would give, in a concise form, such general information about New South Wales as would be desired by a person proposing to emigrate from the Old World to the State, or needed by an immigrant on arriving here with his wife and family. This "Guide for Immigrants and Settlers," as originally forecast, was divided into thirty chapters, and the assistance of competent men in the Public Service was invoked to supply the expert information needed. The numerous inquiries received in this Department since the policy of assisted immigration was initiated in January, 1906, have given me further clues to the varied kinds of hints likely to be asked for, and every effort has been put forth to make this publication as complete as possible for the purpose in view, in order to save the expense of making separate and individual replies to the many inquiries from Europe and America, for minute details about our conditions of life in New South Wales. Some of the chapters as supplied to us had to be remodelled, others re-written. In the meantime Mr. PERCY HUNTER was appointed Editor of Publications, and the work of co-relating the diverse views, rectifying overlapping functions, and correcting obsolete statistics, fell into a relentless journalist's capable hands. Credit has been given in every case where due, the author's name appearing at the head of each article contributed by any officer or other person outside this Department. For the articles not signed the editor and myself are responsible. The only "other persons" above referred to are Professor ANDERSON STUART, Mr. H. G. MCKINNEY, and Mr. W. HESSEL HALL. To the first has to be credited the chapter on Health, which will be much appreciated by fathers and mothers newly come to settle amongst us; to the second gentleman we owe the useful notes on Irrigation, the outcome of his experience first as an engineer in India, and afterwards as Chief Engineer for Water Conservation in this State; and to the last-mentioned we are indebted for the valuable article on Bee-keeping, the result of his own practical and successful labours at the Lapstone Apiary, on the slopes of the Blue Mountains, near Emu Plains. Perhaps the simple facts now stated will adequately account for any small discrepancies in facts and in figures that may have escaped the editorial eye, also for some want of homogeneity in the plan of treatment, and diversity of tone, spirit and flavour. This will, it is hoped, be corrected by our own efforts, aided by criticism friendly and otherwise; and when the present edition of 7,000 copies shall have been placed by the Immigration Officer of the Agent-General's Office in London, we shall bring out a new edition which will, we confidently trust, be more worthy of our excellent subject and our own aspirations. The part of the book with which we feel that we have most cause to be satisfied is the illustrations, which were made from photographs, most of which were got specially for this work by the cordial co-operation of the Government Printer (Mr. W. A. GULLICK). If there be any inappropriate views in this edition, they will be replaced in the next one by new and striking pictures of typical industrial scenes, now being procured from different parts of the State.

The experience of the needs of immigrants and settlers, which we expect to gain during the coming year, will doubtless suggest many additions to and amendments of the letterpress.

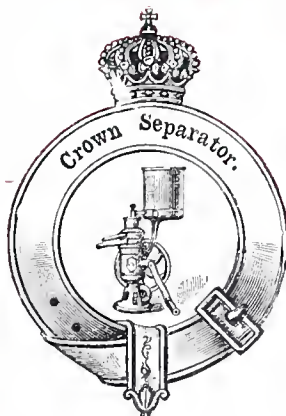
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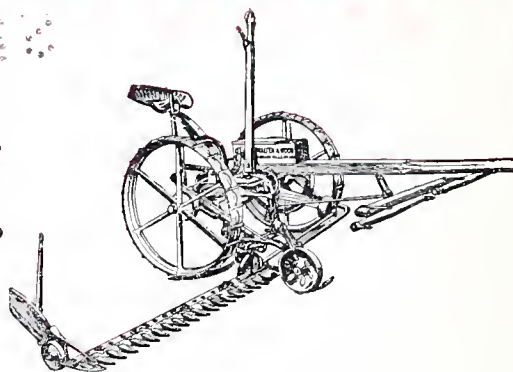


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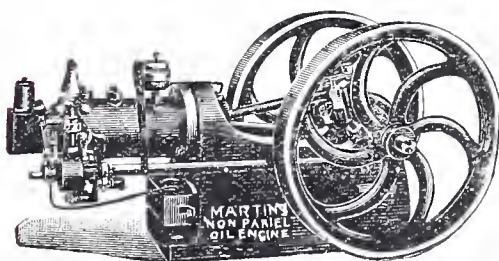
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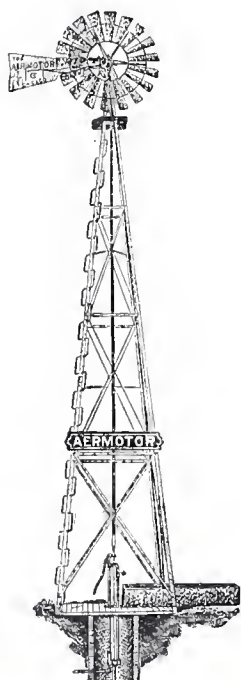
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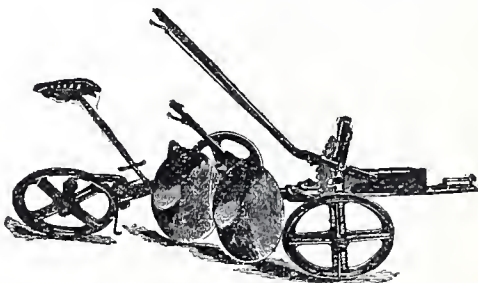
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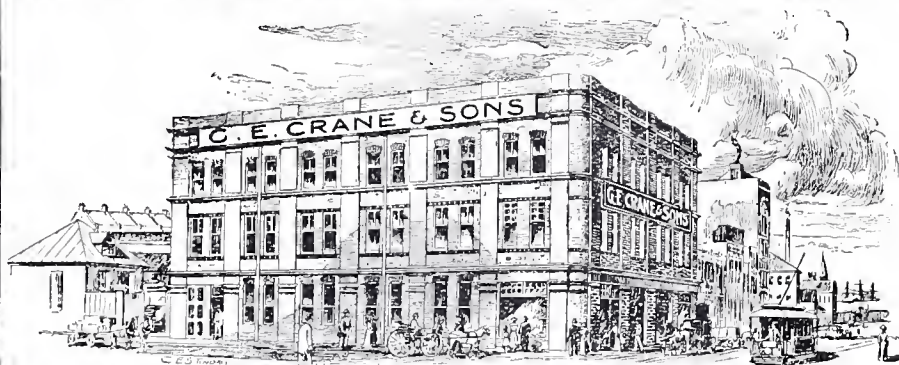
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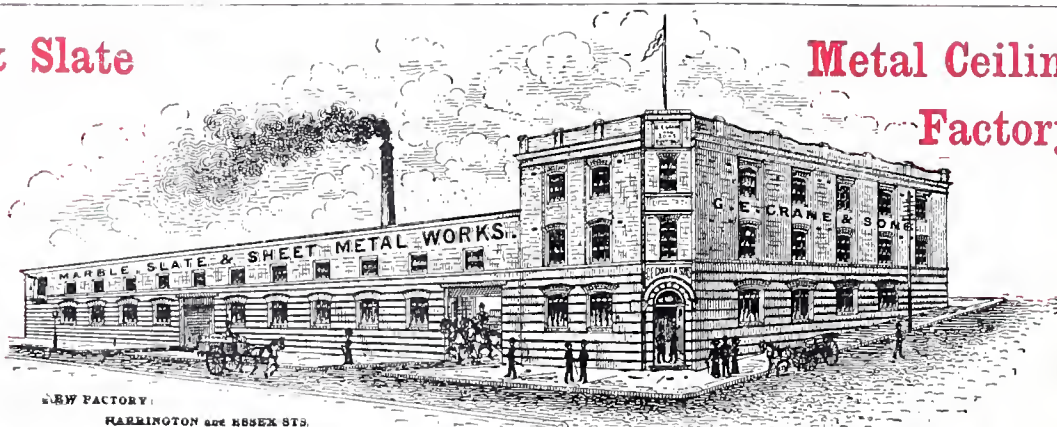
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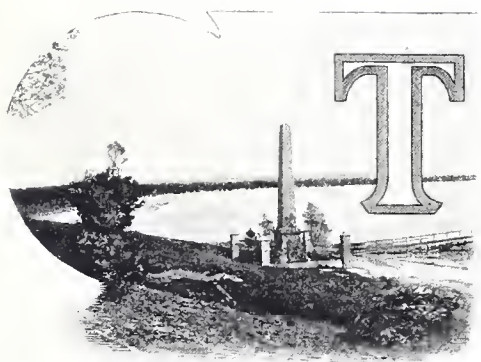
NEW SOUTH WALES THE MOTHER STATE

A GUIDE FOR IMMIGRANTS AND SETTLERS.

CHAPTER I.

Historical.

BY F. M. BLADEN, F.R.G.S.,
BARRISTER-AT-LAW.



CAPTAIN COOK'S LANDING-PLACE.

THE history of New South Wales as a British possession commenced on 28th April, 1770, when Captain Cook, accompanied by Joseph Banks and Dr. Solander, landed at Kurnell on the southern shore of Botany Bay, and took possession of the country in the name of King George the Third.

Eighteen years afterwards Governor Phillip arrived from England, and at Sydney Cove, Port Jackson, founded a settlement, repeating Captain Cook's act of taking possession. The first few years were spent in struggling against adverse conditions. Poor and scanty food, insufficient and inferior clothing, defective implements and tools, and a narrow strip of unproductive coastland, were amongst the principal obstacles with which the first settlers had to contend. In 1792, Governor Phillip, worn out by the strain of undivided responsibilities, returned to England.

Practically speaking, the Colony, during Phillip's administration, lived on the rations received from England. There were a few small farms on the Parramatta and Lane Cove Rivers, but they contributed very little to the food supply.

Major Grose (Acting-Governor during Phillip's absence), may be said to have initiated the agricultural and farming industry. He gave to his officers farm lands and labourers, and encouraged them to cultivate maize and wheat, purchasing, for the Government stores, their harvests at prices as high as 10s. per bushel for wheat, and 5s. per bushel for maize. Early in 1794, he sent twenty-two pioneer farmers up to the fertile banks of the Upper Hawkesbury

River. Their small thirty-five acre blocks covered the whole of the right bank of Pitt Reach. The success of the experiment was immediate.

Major Grose reported in April, 1794, that "whatever they have planted has grown in the greatest luxuriance." In August of the same year their numbers had increased to seventy; in June, 1795, the farms extended for thirty miles on both sides of the river, and the settlers

and their families numbered 304 persons. In June, 1799, the population at the Hawkesbury was 955, nearly all of them being free settlers. At this time, and for many years afterwards, the rich flats flanking the Hawkesbury and Nepean Rivers constituted the granary of the Colony; in fact, in some years the



THE LANDING OF CAPTAIN COOK.

[From an oil painting by Phillips Fox.]

crops were so plentiful that the small market at the capital of Sydney was glutted.

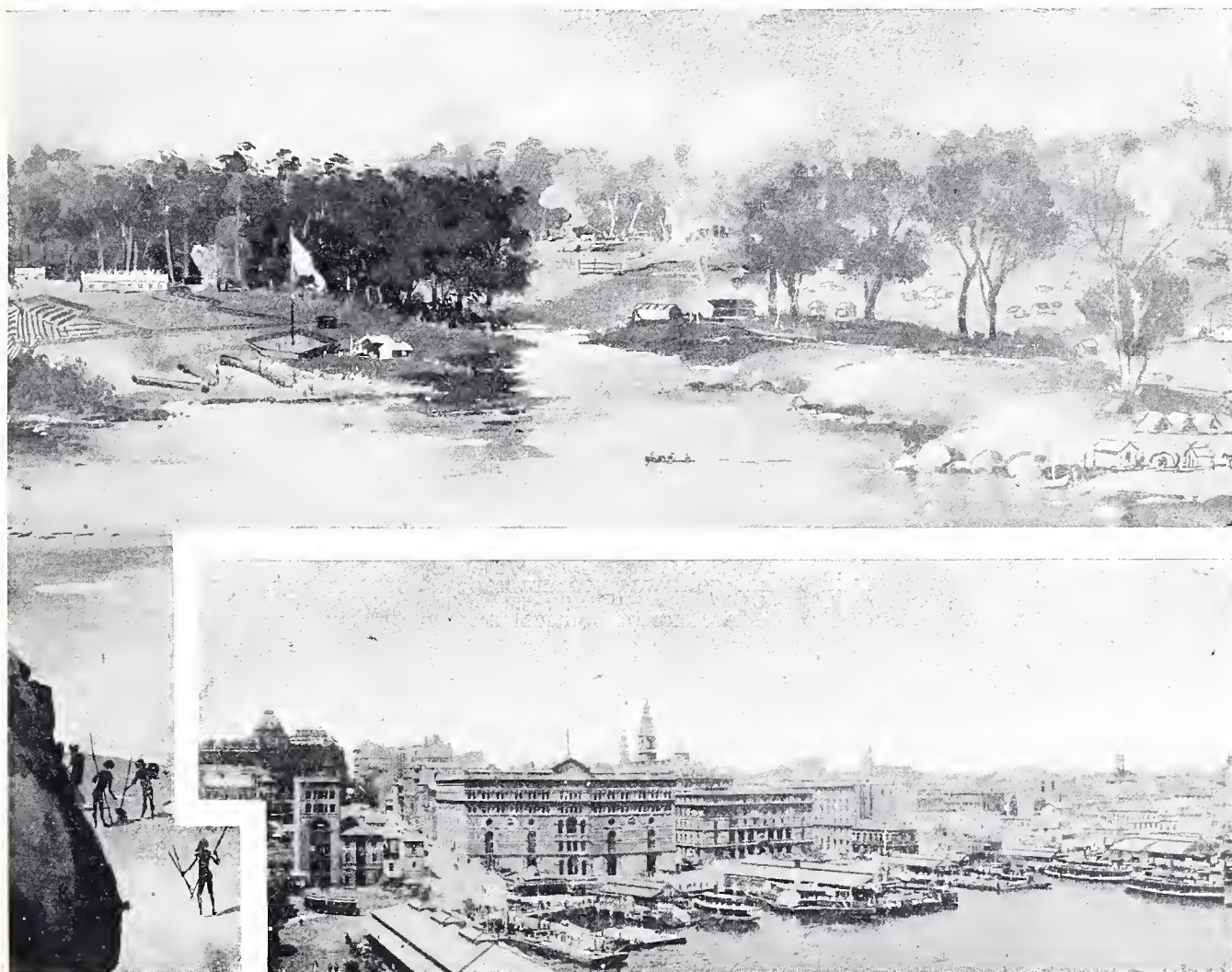
In the matter of live stock, the early settlers were, if anything, less fortunate. In September, 1788, Governor Phillip wrote that while their hogs and poultry were thriving, only one sheep, out of seventy purchased at the Cape, remained. The whole of the cattle were either dead or lost. From this time until September, 1791, the Colony was practically destitute of horned live stock. In that month Lieutenant-Governor King landed from H.M.S. "Gorgon" with 18 head of cattle and 59 sheep from the Cape. In April, 1793, some swine, one calf, and four sheep were landed from the Californian coast. In March, 1795, the officers imported from the Cape 74 horses and 12 sheep.

In 1795 a large herd of wild cattle were found in the Cow Pasture (Camden) district. They were the progeny of the Cape cattle which had wandered into the bush and been lost, soon after Phillip landed. In 1797, Captain Waterhouse and Lieutenant Kent brought from the Cape a number of pure bred Spanish merino sheep. From this year the production of high-class wool may be said to date. The total live stock, including that in the possession of the Crown, was at this time as follows:—Cattle, 327; sheep, 2,457. In ten years (1807) it had risen to 6,643 and 25,260 respectively.

**The Early
Settler.**

In the early decades of the century, the British Government spared no pains to settle men of means upon the soil. To the intending emigrant commanding a minimum sum of £500, exceptional inducements were given.

Free passages were provided for himself, his family, and servants ; his goods, furniture, and stock were carried free, and when he landed he was given a free grant proportionate to his capital ; convict servants were assigned to him, and for some time after landing rations were furnished from the public store ; and finally, at harvest time, the Government storekeeper purchased his surplus wheat and maize. In this way the fortunes of many families of present day prominence were founded by men of birth and culture. The remarkable healthiness of the climate, particularly the absence of malarial and febrile diseases, from which the early settlers in America suffered so much, was a great inducement to men of means and retired officers in England and India to emigrate to New South Wales.



SYDNEY COVE 1800-1900.

In 1813 the need for more extensive pastoral land was accentuated by drought; and, a route having been discovered over the Blue Mountains by Blaxland, Wentworth, and Lawson, an immediate exodus of settlers and stock from the coastal districts, took place.

From about the year 1820, the occupation of the country drained by the Macquarie and Lachlan Rivers steadily increased. This period saw the **Occupying the Interior.** birth of the familiar squatter. In the first instance he was a trespasser on Crown lands lying beyond the confines of settlement. Before long his existence was recognised by the Government, and a small annual license fee charged.



THE COW PASTURES—CAMDEN DISTRICT.

With incredible rapidity these pioneers of civilisation penetrated and occupied the interior. In 1827 they were on the sources of the Murrumbidgee in the south, and northward as far as the Liverpool Plains.

The period 1831-41 saw

enormous increases in population and in the area of discovered country. In the former year, the population, including that of Van Diemen's Land, was only 79,306; at the close of 1841 it had increased at the phenomenal rate of 10 per cent. yearly, and amounted to 206,095. This increase will appear the more remarkable, when we remember that it occurred long before there was any idea that gold was procurable. It was before the partition of the mother colony, and before the full measure of political autonomy had been conceded. The explorations of Sturt and Mitchell, following closely on those of Oxley, Evans, Meehan, Throsby, Cunningham, Hume, and Hovell, had thrown New South Wales open as far westward as the Darling, and southward to the Lower Murray; in addition, the nuclei of future colonies were forming at Port Phillip, Adelaide, and Swan River, and an enormous area of vacant country was thus made available.

These facts were not unknown in England, and afford one explanation **Birth of the Wool Industry.** why so many hardy and venturesome immigrants arrived. It was the period of emigrants' guides and handbooks, in which the high wages and broad acres of Australia were painted in glowing colours. Another great attraction which Australia possessed at this time was its growing reputation as a country

eminently suited, by climatic and other conditions, for the production of high-class wool. The credit of demonstrating the possibilities of Australia in this respect belongs to John McArthur, though he had not, as is popularly supposed, any hand in the importation of the first merino sheep.

The growth of the wool trade at this stage of the Colony's history may be gathered from the fact that the quantity of wool exported in 1840 was 13,364,000 lb., as compared with 1,893,000 lb. in 1830, and 99,000 lb. in 1820. The later development of the industry will be found dealt with in its proper place.

The whale and seal fisheries in the early days, occupied much more attention than is now realised. In one year (1836) the export of oil, skins, &c., amounted to nearly a million and a quarter sterling.

The estimation in which Australia was held in England in the forties **A Continent as** (when transportation had practically ceased), can be gathered from the **a Gift.** statement of a contributor to Blackwood's Magazine in July, 1848:—

“Australia is the greatest accession to substantial power ever made by England. It is the gift of a continent unstained by war, usurpation, or the sufferings of a people.” It may be said that during the first half of the century three elements contributed to the remarkable prosperity of the Colony—first, the existence of large areas of good and accessible land, suitable both for pastoral and agricultural occupation; second, the presence of sufficient and reliable markets, both local and foreign; and third, an abundance of cheap labour.

The period of activity in pastoral occupations which marked the close of the first half of the century was followed in 1851 by the



ONE OF THE FIRST FARMS ON THE HAWKESBURY.

separation of Victoria, and the discovery in the same year of gold in the Bathurst district. Population flocked to the Colony in unprecedented numbers. This was not an unmixed and

universal advantage. Labour was for some time diverted from its normal channels, and the more permanent industries of the country suffered. It was not long, however, before the affairs of the State righted themselves. In two years (1851-3) the trade of the Colony more than doubled itself, and a general revival in industries and agriculture took place.

One consequence of the increase in population and wealth which marked this epoch in the Colony's history, was a general dissatisfaction with the **Responsible Government.** form of government, culminating, in 1856, in the concession of responsible government. This was a time of widespread activity; railways, electric telegraphs, postal service, and steamship communication were quickly transforming the face of the country, and ameliorating the conditions of life.

In 1859 the last division of the mother colony took place, and Queensland was proclaimed a separate dependency.

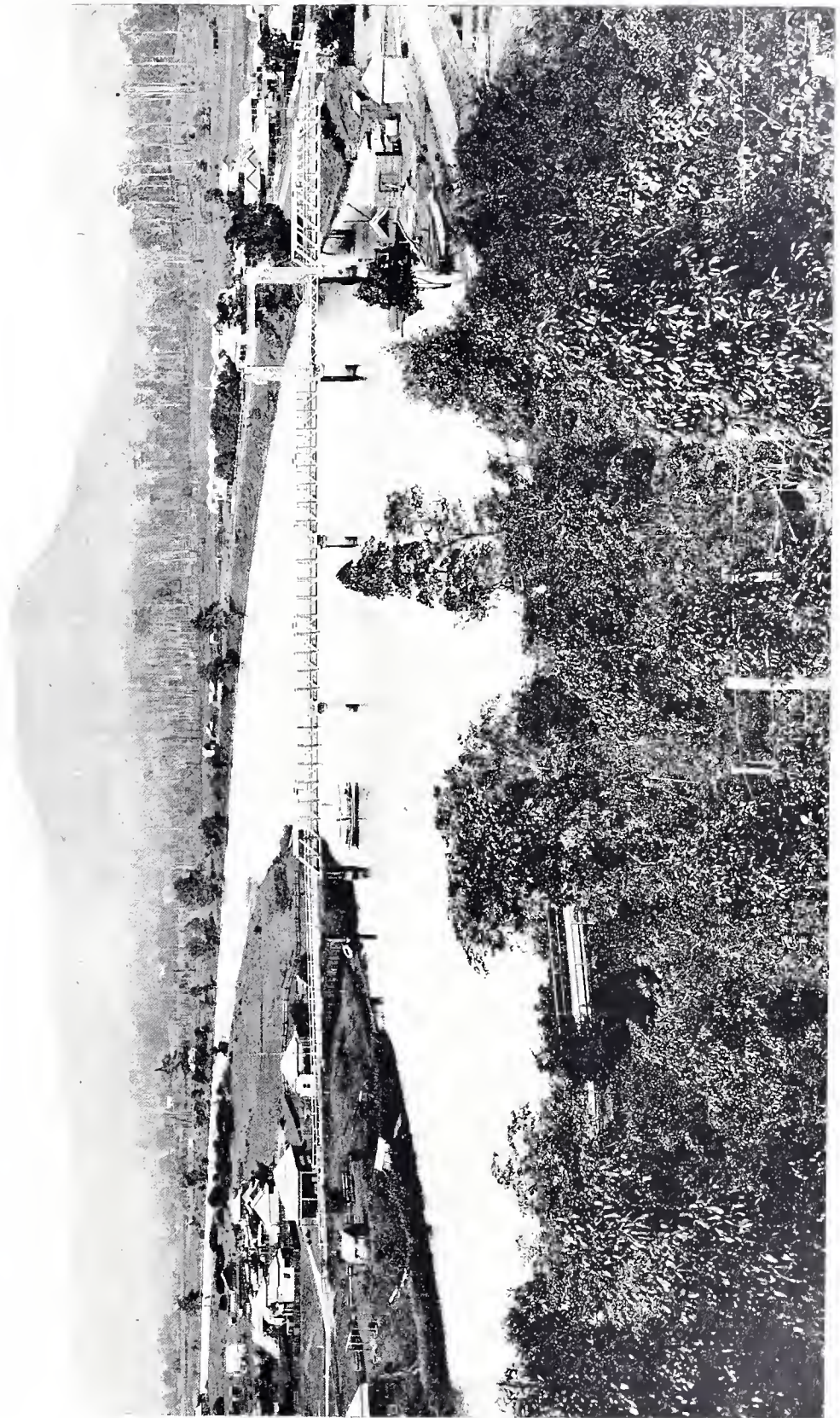
The feverish absorption of the gold-mining mania was, naturally, followed by a period of reaction, which took the shape of a revival of the agricultural and pastoral activity of the forties. As the attractiveness of the gold diggings wore off, men clamoured for land. It was, however, impossible to meet their demands under the old system of auction sales; and, in 1861, under Sir John Robertson's Land Act, they were allowed to select and occupy their holdings before they had been surveyed. The provisions of this Act and subsequent amending Acts will be more appropriately dealt with in the chapter bearing on the Land Laws; here it is sufficient to note that they had an important bearing on the history of the Colony, inasmuch as they tended to facilitate the operations of men of limited means who were desirous of going on the land.



THE SNOWY RIVER.

It is impossible, within the limits of a sketch so brief as this is, to deal with even the leading facts in our history, such as the inception and extension of our railways, the history of our educational system, our technical colleges and university, the growth of a free Press, the birth and condition of our manufactures, and the vast mass of domestic legislation which our statute books contain.

The most significant aspect of present day public thought has been the growing appreciation of our Imperial responsibilities. Evidences of this were prominent in the recent Boer war, and in the willingness expressed by men of every shade of political belief to bear a share of the cost of our naval defence. Some such sentiment as this was, doubtless, partly responsible for the movement which culminated in the federation of the Australian States.



BRIDGE OVER THE TWEED RIVER, NORTH COAST DISTRICT.

AUSTRALIAN INVENTION AND MANUFACTURE.

The Sun never sets on the

SUNSHINE HARVESTER



In Use Throughout the Commonwealth and the
Greatest Wheat-fields of the World.

DOES THE WHOLE WORK OF
HARVESTING THE GRAIN AT A
COST OF LESS THAN 1s. PER ACRE.

HUGH V. MCKAY,

MELBOURNE, SYDNEY, ADELAIDE,
BUENOS AYRES, S.A.

CHAPTER II.

New South Wales as a Field for the Immigrant and Settler.

A Brief Resumé of the Resources and Industries of the State—Prospects for Newcomers—Cost of Living—Food Supply—Attractive Tourist Resorts.



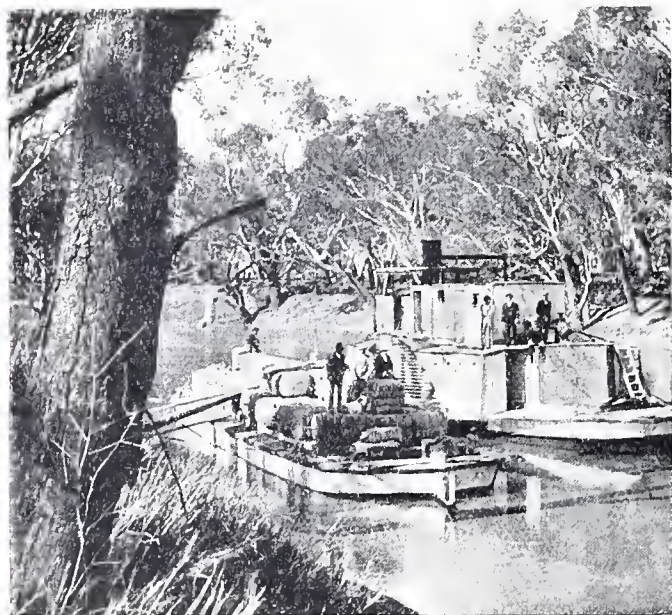
AS a field for immigration, New South Wales, the wealthiest and most prosperous of the Australias, is almost without a rival. To the man in Great Britain, thinking of changing his home, a journey to the antipodes may, at first sight, appear something of a formidable undertaking. Because New South Wales is 12,000 miles distant from Europe, he may be inclined to turn his thoughts in the direction of some nearer field for his endeavour to carve out fortune from a new and kindly territory. But the thought of distance should not deter him, nor turn him from the path along which lies the most material advantage. The modern steamship, palatial in size and appointments, swift almost as an express train, and as well provided as a London hotel, reduces the 12,000 miles' voyage to a mere holiday jaunt, and a most pleasurable one at that. The Australian liner traverses no dangerous waters, encounters no icebergs, and never lies in the track of those ocean greyhounds that dash through the Atlantic at breakneck pace, oblivious of everything but the chance of smashing the record for the trip. The voyage from England to Australia is eminently a safe one; it is made through summer seas, where every prospect is novel and entrancing; it brings the voyager into touch *en route* with some of the oldest and most interesting countries in the world. As a holiday experience it is unparalleled; as an educative factor it is of great importance.

In order to induce the British agriculturist to try his fortune in New South Wales, the Government of the State has made arrangements with several shipping companies, including those whose mammoth steamers thread the

A Cheap Voyage. Suez Canal, and call at the wonderlands of Egypt and India by the way, for exceedingly low fares to cover the six weeks' voyage. An immigrant, approved by the New South Wales Agent-General in London, may be carried right to Sydney, the chief city of the Southern Hemisphere, for from £8 to £12 third class, and £28 second class. Thus, by the

liberal provision of the New South Wales Government, an immigrant may enjoy a wonderful holiday journey over historic routes, the pleasures and delights of which will never vanish from his memory, see a number of strange lands, and disembark in the very best of the new countries for the ridiculously small sum of £8. He will meet with no cold weather on the journey, and light clothing will suffice for all his needs. When he leaves the old land for New South Wales, he will have done with snow and sleet, grey skies, and biting east winds, and will enter into a heritage of glorious sunshine and balmy atmospheres.

Now what has New South Wales to offer to the immigrant? It offers
What N.S.W. Offers. opportunities both to the man with and to the man without capital. It is the land of rapid advancement, of equal opportunity. A rich reward awaits application, energy, and perseverance. For the capitalist there are many industries and avenues of activity awaiting exploitation. A young, vigorous, and fast-growing



STEAMER AND BARGE, MURRAY RIVER.

population provide an expansive home consumption; and the world's markets, owing to the magnificent lines of communication linking Australia with the older countries, lie within easy striking distance. For the agriculturist with a small capital it may be said that New South Wales possesses nearly 20,000,000 acres of good virgin wheat land, within the 20 inches rainfall belt, awaiting settlement. A large proportion of this land has been alienated by the Crown, but the policy of the Government is now to resume estates suited for close settlement and wheat-farming, and make them available for immigrants and local settlers. This work is also being done privately, and a number of

big estates are at present being subdivided in various districts; so that the man with sufficient capital to enable him to make a start with a farm will have no difficulty whatever in procuring the land he needs.

The terms upon which the land is sold, both by the Government and by
The Price of Land. private owners, are exceedingly liberal, and only small deposits are required. Land that is suited for wheat-growing combined with grazing will fetch from £2 to £5 per acre, according to the quality of the soil and the proximity to the market, whilst land that is best adapted to dairying and maize-growing will bring from £4 to £20 per acre. In most cases where high prices are asked, it will be found that the farms



PLOUGHING LAND FOR WHEAT.

are well improved and ready for immediate profitable occupation. Full particulars as to land available, and prices and terms, may be obtained on application to the New South Wales Agent-General, 125, Cannon-street, London, E.C., or the Intelligence Department, Phillip and Bridge streets, Sydney. It may be felt that the New South Wales Government should emulate the examples of other Governments and make a free grant of land to immigrants; but it will usually be found that what costs nothing is worth nothing. There is land in New South Wales which could be acquired for the proverbial song, but it is a long way from the railway line, and outside the area where the practical certainty of an average rainfall of 20 inches makes wheat-growing profitable. The owner of a good farm in the New South Wales wheat belt has an asset which in a few years will make him a prosperous landed proprietor. It may be safely stated that no other country at the present time offers such unrivalled opportunities to practical farmers with a small capital as New South Wales. Not only will they find a congenial climate and surroundings, but they will have the advantage of living under a Constitution the freest in the world, and at the same time be sure of securing a profitable and rapid return for their labour. On arrival in Sydney immigrants are taken in hand by officers of the Intelligence Department, their needs are ascertained and the best advice is given them. If they wish to obtain either Crown or private lands they are immediately put in touch with experienced officers, who will afford them every assistance. Liberal concessions on the railways are granted to those who purchase land for settlement, both in regard to passengers' tickets and furniture and effects.

For men without capital, but possessed of agricultural experience, there are abundant openings, as the New South Wales agricultural industry is expanding rapidly and good farm labourers are always in demand. Youths who have had no experience in farm life, but who are willing and capable, will readily find employment with thoroughly competent and successful farmers, who will undertake to instruct them in all branches of farm out in a couple or able to manage a To these young lodging is pro-small wage will be year, sufficient pocket money, wage will afterwards be paid according as the youth proves his usefulness. Wheat-farming is not the only avenue of activity open to men with small capital. The dairying industry has of recent years rapidly advanced in favour, and to-day, on the rich dairying lands of the North Coast, thousands of acres of which are at present unoccupied, will be found farmers in prosperous circumstances, who started only a few years ago with no capital but a hopeful heart in a sound and healthy frame.



The State of New South Wales comprises an area of 198,634,880 acres, or a little over two and a half times that of Great Britain and Ireland put together. The coastal area—that lying between the Main Dividing Range and the sea—may be taken as the first division of the State. It comprises some 18,000,000 acres, and is fertile and well watered, enjoying an average rainfall of 42 inches. It is traversed by fifteen rivers of various sizes, all of which flow into the South Pacific Ocean. The tablelands of the Great Dividing Range contain some 39,500,000 acres, and may be classed as the second great division of the State. On these tablelands—



GORGE IN THE DORRIGO, NORTH COAST DISTRICT.

many of which attain an average altitude of 3,000 feet—will be found some of the richest agricultural lands in the State, on which the farming methods of the old country can be followed successfully, and, though situated at no great distance from the tropics, their climate is so mild and bracing that they are becoming famous as health resorts. The average rainfall may be taken at about 25 to 31 inches, though in some parts it is far heavier. The third division of the agricultural portion of the State—the western slopes of the tableland—containing an area of some 54,000,000 acres, is also a rich and fertile district, with an average rainfall of from

17 to 20 inches. Beyond this the rainfall is smaller, and the country better adapted for raising merino wool—the wool grown here being the very best of its kind in the world—than for farming operations, excepting where irrigation is practised.

Best Climate in the World. In the matter of climate New South Wales is particularly blessed. It would be by no means an exaggeration to say that the climate of the State, at any rate in the middle coastal district, is the best in the world. Everywhere throughout the territory the climate is genial. In the farming districts there is no long bleak winter, the days of the New South Wales winter months

being for the most part warm and sunshiny, the early mornings and nights being of course colder. In summer the heat is not by any means terrible. Heat waves, such as occasionally sweep New York and other parts of America, are unknown. In the coastal region the summer is exceedingly mild; as a rule, even in the hot districts, the nights are cool and refreshing. There are great areas of New South Wales which know neither extreme of heat nor of cold, but enjoy all the year round a beautifully even and pleasant temperature, slightly warmer in summer and slightly colder in winter, broken only by a few days' rain here and there through the seasons. Practically, the only inclement weather is wet weather, and it is no doubt this magnificent climate, kind and genial, that renders New South Wales, both for man and stock, the most healthy country in the world. In no other land is the farmer and stock-keeper less plagued by disease in his household, his animals, or his crops. Save in the mountain districts, and on the highlands, only very light clothing is necessary all the year round; houses may be of exceedingly light construction and yet perfectly comfortable; men may camp in the open without a tent, and out-door existence is by far the most pleasurable method of enjoying life. This mildness of climate is a matter of great importance to settlers, as it materially reduces the cost of farming, both by reason of the fact that live stock require no housing nor rugging, and the harvesting operations are greatly facilitated. The glorious weather always enjoyed in New South Wales gives the State a great advantage over countries where the farmer is practically snowed up for five or six months of the year, or where the fierceness of the sun burns and



blisters his crops before he can garner them. The Australian droughts, of which so much has been said, occur only at long intervals, and they have their effect chiefly in the country beyond the line of the 20-inch rainfall, outside which line settlers are not advised to cultivate wheat. It is the great pastoral industry carried on in the Western Division of the State where the rainfall is uncertain that suffers most from the drought when one

occurs; but so prolific is this country under good seasons that one or two good years give returns of high-class wool that more than compensate for a run of dry seasons. The quality of the soil in this Western country is of a very high degree, and frequently, when rain falls opportunely after a dry spell, the growth is so luxuriant that the fine pasture grasses reach over the withers of



THRESHING.

horses. Taking the coast generally, the difference between the mean summer and the mean winter temperature may be set down as averaging not more than 24 degrees—a range so small as to be but rarely found elsewhere. The famed resorts of the Mediterranean seaboard bear no comparison with the Pacific Slopes of New South Wales, either for natural salubrity, or for the comparative mildness of the summer and winter.

Wheat-growing, perhaps, offers the most attractive field to the agricultural

The Most newcomer who has enough capital to take up an area of land and prepare **Attractive Field.** it for the plough. He will find in New South Wales that he is very fortunately placed. He will not be hampered by weather conditions in his ploughing or harvesting. The wheat ripens evenly, permitting the cheapest methods of harvesting to be employed. Thus, while the complete cost of producing a crop in Canada is estimated at 30s. per acre, in New South Wales it is not more than about 17s.; while an expert calculation, giving full details, has recently been published placing the figure at 13s. 9d. Wheat may be considered at bed-rock value when it brings 2s. 6d. per bushel at a New South Wales country railway station, while it, of course, frequently brings higher prices than that. From these figures a prospective wheat-grower can see the probable value of his crops. The average yield for a number of years over the whole of the State has been 10 bushels to the acre, and the crop failed in one season only—1903. In the following year, however, the average was 17 bushels to the acre. At the end of March, 1905, the cultivated area of the State was 3,280,970 acres, and the area under wheat 1,775,955 acres. In 1905, the wheat crop realised 16,464,415

bushels, giving a large exportable surplus. The present harvest has resulted in the return of about 20,000,000 bushels, and the indications are that a very rapid expansion will take place from now onward.

So far as communication with the outside markets of the world is concerned, **From Farm to Market.** the New South Wales wheat-grower suffers no handicap on account of his immense distance from Europe. It should not be forgotten that the wheat is grown in New South Wales at no great distance from the coast, and, therefore, the grain has not to be hauled for 1,500 miles over expensively-maintained railways



OPOSSUM.

before the ship's side is reached. In New South Wales, too, the railways are owned by the Government, and are conducted on lines which keep the successful development of the country well in view. Thus, as regards ocean freights, Canada, of course, has an advantage over Australia; but from farm to market the advantage is with the Australian grower. For instance, Regina, a great centre wheat of Canada, is nearly 2,000 miles from the coast, and the handling and freight on grain thence to Liverpool costs 1s. 2d. per bushel, as compared with,

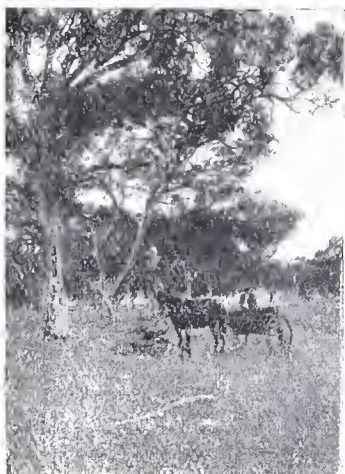
say, 1s. 3d., from wheat centres in New South Wales to London, reckoning from districts 300 miles from Sydney, and even less for South Australian and Victorian produce. The size of the wheat-farms varies from 500 to 5,000 acres.

The man who thinks of settling in New South Wales need by no means **Range of Agricultural Activity.** confine his activities to wheat-growing. A system of mixed farming, of cropping and stock-raising, is becoming popular. It keeps the farmer occupied in the long period when he can do little or nothing to help the wheat, and increases the productiveness of his farm, and consequently his profits. In the New England districts, on the tablelands, are numbers of settlers who combine fruit-growing with crop-raising, apples doing splendidly in these localities. But the great auxiliary of wheat-growing is sheep-raising. There are, at the present moment, over 11,000 flocks of sheep in the State of 500 sheep and under, and 2,700 flocks numbering between 500 and 1,000 each; so it will be seen that sheep-raising is practised by a very large number of small holders. The merino predominates, but latterly the farmers are taking to growing a good style of cross-bred that produces both wool and first-class mutton, and is altogether a very profitable animal to handle. There is a limitless field in New South Wales for the mutton trade, which is as yet scarcely touched. Wheat farmers run their sheep on natural grasses and on the stubble and growth in the cultivation paddocks that are not in use. The sheep is a cleaning and fertilising agent

all over the country, and never fails to improve the capacity of the pasture unless the land be overstocked. A good merino flock will cut an average of 7 lb. of wool, worth to-day 1s. per lb. in the grease. There are many other crops that the farmer may raise, prominent among them being sugar-cane, the cultivation of which forms, with dairying, the chief occupation of the settlers on the Northern rivers. Sugar-cane is an exceedingly valuable crop, and a great stretch of the Northern River district of New South Wales is peculiarly well adapted for it. There is room for great expansion in this direction, and an assured market for all the sugar grown. Immense areas of the State, too, are suitable in every way for the cultivation of malting barley of the brightest colour, and fine germinating properties. At present only some 15,000 acres of the State are under barley, and such success has been achieved in the cultivation that doubtless greatly increased attention will be devoted to it in the future. Bulk samples of New South Wales barley, recently sent to Great Britain and America, were most favourably commented upon, and the bright colour and superior malting properties of the grain caused it to be ranked for brewers' purposes in the highest place among all competitors. Maize is another crop to which the farmer may turn his attention with profit and advantage, from 80 to 100 bushels per acre being not an uncommon return; and in certain districts lucerne is most successfully



HARVESTING.



cultivated, while in the northern portion of the State bananas, coffee, passion-fruit, and other tropical fruits and plants grow in wild profusion, side by side with potatoes, cereals, tobacco, onions, vines, and other products of colder climes; in fact, New South Wales extends over so many degrees of latitude, and the soil and climate are so varied, that it would be hard to mention a crop which would not thrive in some portion of the State. A most important industry is that of wine-making, the soil and climate of New South Wales possessing all the elements necessary for the production of first-class wines, both sweet and dry. At present some 8,800 acres of the State are planted with vines, and the area is being increased each year. At international exhibitions, New South Wales wines have gained the highest encomiums from judges accustomed to test the vintages of the world. The export market has so far been hardly touched by New South Wales wine-growers, only some 100,000 gallons being exported annually. With conditions so favourable, and land so cheaply and readily obtained, investors are likely to find a great and profitable return in the development of this industry.

The whole stretch of the immense New South Wales coast line is suitable for the dairying industry, in which the State has made its greatest advance in recent years. The butter export trade is a great and growing one, £818,000 worth of butter having been exported in 1904-5. There are large areas of land suitable for dairying obtainable at a comparatively small cost, and the industry is capable of almost illimitable expansion. The general adoption of the factory system in all the chief dairying districts of the State ensures a ready cash return for the milk or cream of the suppliers. Though the industry is mainly confined to the coastal regions, it is also actively pursued in the more favoured parts of the interior, and the tendency to devote good pasture lands to the production of butter is spreading fast. The breeding of pigs is generally carried on in conjunction with dairying, and as New South Wales still imports bacon and ham it will be seen that there is plenty of room for expansion in this direction. Horse and cattle breeding is also conducted extensively; and a somewhat new departure, successfully established, is the raising of angora goats for mohair.

New South Wales is entering upon an era of solid prosperity, and is advancing by leaps and bounds. The value of her products won from the soil in the season just closed was £45,000,000—a marvellous achievement for slightly over 1,500,000 of people,—a result per head not attained by any other country outside Australia. Her trade for the same period was £66,000,000, or £44 per head, which is nearly double that of any other country in the world. In thirty-five years the trade of New South Wales has increased four-fold, her revenue five-fold, her railway earnings ten-fold, and her population three-fold. Great development is

taking place along the whole range of the agricultural, pastoral, and industrial activities of the State, and this development and expansion will provide improved home markets and increased facilities for reaching the foreign consumer. Every immigrant who takes up land and enters upon the work of production pushes on the material prosperity of the State, in which he himself shares. Though the pastoral and agricultural industries are by far the most valuable in the State, there are other resources of the most important character, which have a considerable influence upon the fortunes of the country. The mineral resources of the State are almost boundless. There are limitless coalfields, both on the coast and inland ; immense iron deposits ; the marvellous silver-zinc-lead lodes of Broken Hill, the wealth of which is fabulous ; rich copper and tin ores, distributed over very wide areas ; several important goldfields ; opal and diamond mines ; and some of the choicest marbles in the world. Other valuable minerals found in the State include platinum, cobalt, nickel, manganese, antimony, kerosene shale, emeralds, turquoise, and sapphires. During 1905 the value of the minerals won in New South Wales was £6,812,126, this being an increase of £592,075 over the return for the previous year.



DAIRY FARM, NORTH COAST DISTRICT.

So far as the manufacturing industries are concerned, the great coalfields **Other Industries of New South Wales**, lying close to splendid seaports, make it imperative **of the State.** that in time the State will be the great manufacturing centre of Australasia.

Already the iron trade is, owing to the progressive policy of the present Government, being placed on a thoroughly sound basis, and with iron and coal in abundance, and a most diversified range of raw materials, natural and produced, New South Wales must become one of the great manufacturing countries of the world. In 1905 the value of raw materials was increased locally by manufacture by over £10,000,000.

As a reference to the chapter on the mineral resources of the State will show, there are vast deposits of exceedingly valuable iron ore in New South Wales. Some of these deposits are close to immense coalfields and others are not far distant, the situation being so favourable that the iron ore, limestone, and all the requirements for making iron can be delivered to the



STACK OF NATIVE GRASSES.

vicinity of the coal more cheaply than at any other place in the world. The coal in closest proximity to the iron ore is at Lithgow on the Western Railway line, just beyond the Blue Mountains. Already there are extensive iron-works at Lithgow; but preparations are being made to considerably expand the industry. The New South Wales Government has given a contract to William

Sandford, Ltd., for a supply of all the iron required by the various Government Departments for seven years. In consequence of making this contract Mr. Sandford has arranged to erect a modern blast furnace, steel converters, and rolling mills, and has engaged expert leading workmen in England to supervise the work. The iron industry will thus be placed on a sound footing, and the New South Wales finished product will be able to compete with the imported article. This development is expected to have an important effect on the industries of the country.

The timber resources of the State are exceedingly valuable, and a great industry will be built upon them. The hardwoods of the State are superior to most other for wood-paving purposes, and have earned a world-wide reputation. There is a considerable export trade now in existence, and there is great promise of expansion, because time is telling in favour of the New South Wales woods. The more the outside world knows of them, the greater becomes the demand, and the more prosperous grows the timber trade of the State. Nearly

all the varieties of New South Wales hardwoods have a greater strength than the English oak, and the grey ironbark has a resistance considerably superior to teak. The forests are in the charge of a Government Department, and the industry is being fostered. A vast field awaiting exploitation in connection with fisheries, and experts estimate that most profitable industries in this direction, both for the home supply and for export. The waters along the 700 miles coast line of New South Wales simply teem with fish of the most valuable kinds, but, so far, practically no endeavour has been made to utilise this immense natural food supply, in 1904 frozen and preserved fish to the value of £782,000 having been imported to New South Wales.



VIEW OF BAULKHAM HILLS.

The Government of New South Wales is similar to that of other British Colonies—democratic and stable. Its institutions are the freest in the world; the solicitude of the administration for the producer is almost paternal, and the conditions of life are most comfortable.

There is no church endowment in New South Wales. At the census of 1901, 46 per cent. of the population were members of the Church of England, 25 per cent. were Roman Catholics, 9 per cent. were Presbyterians, and 10 per cent. were Methodists.

A system of advances of money to settlers by the State is in vogue, and has been found to be very beneficial to the producer who may be struggling under adverse circumstances; and in times of misfortune, caused by bush-fire or other misadventure, the Government not infrequently comes to the aid of the farmer by advancing seed wheat, or in some other appropriate manner. The settler will find every encouragement to succeed, and, given a healthy determination, allied with pluck and perseverance, the man who takes up a farm anywhere inside the 20-inch rain-belt of New South Wales should steadily progress.

So productive is the soil of New South Wales, and so wide are the ranges of climate to be found within its borders, that the State is capable of producing in abundance everything essential for the comfortable sustenance of human life. Not only is New South Wales independent of other countries for the principal articles of the food supply of her people, but vast quantities of wheat, flour, meat, and butter are annually exported. When the comparatively high rate of wages is taken into account, the prices are decidedly low, and meat and other classes of food, which in other countries are regarded as luxuries, are in New South Wales consumed freely even by the poorest of the community. Each person, on an average, consumes during the course of a year 269 lb. of meat (151 lb. of beef, 106 lb. of mutton, and 12 lb. of pork), 238 lb. of flour, 178 lb. of potatoes, 109 lb. of sugar, 21 lb. of butter, 10 lb. of rice, 6 lb. of oatmeal, 4 lb. of cheese, and 7 lb. of tea.

Food Supply
and
Liquor Bill.

Of wheat, the 9,000,000 bushels that are required for home consumption for food are all supplied from the wheat farms of the State, and a large surplus remains for export. The consumption of meat is very large, and in this respect also New South Wales would be independent of other States and countries, were it not for the fact that her people prefer beef to mutton, and this at present necessitates the importation of stock to cope with the demand for this class of meat. A certain quantity of bacon and ham is also imported. Of potatoes about 2,500,000 cwt. are consumed annually, of which nearly one-half is grown locally, the remainder being provided by neighbouring States. The sugar consumption is enormous, and of the total of about 66,200 tons required annually nearly one-third is supplied locally by the farmers of the North Coast district.



IANDRA HOMESTEAD.

The average consumption per head of intoxicants in New South Wales remains now at about the same level as ten years ago, and represents a considerable decrease from the figures for previous decades. The actual alcohol (proof spirit) consumed on an average by each inhabitant in the course of a year now amounts to a little over 2 gallons, as opposed to nearly 3 gallons in 1891, and the annual expenditure per inhabitant has decreased from about £4 6s. in the latter year to under £3 5s. at the present time. The total expenditure on alcoholic liquors is now actually less, with a population of over a million and a half, than it was in 1891, when the inhabitants were fewer by 372,500 persons. The annual consumption per head now is:—Spirits 0·78 gallons, wine 0·68 gallons, and beer 9·00 gallons; so that the New South Welshman drinks decidedly less spirits than his brother in the United Kingdom, rather more wine, and less than a third as much beer.

The annual expenditure per head of population has been estimated at
Cost £40. Of this amount, about one-third (or £14) is spent on food, one-eighth
of Living. (or £5) on clothing, and one-tenth (or £4) on tobacco and intoxicants. It

would be difficult, in small compass, to give any accurate idea of the average prices of the different articles of food that are most largely consumed, which would hold good for the whole State, as the prices vary considerably in different localities. But the following figures represent the average retail prices in Sydney of some of the principal food commodities :— Bread, per 2 lb. loaf, 2½d. to 3d.; fresh beef, per lb., 5½d.; mutton, 3d. per lb.; butter, 1s. per lb.; cheese, 8d. per lb.; sugar, 2½d. per lb.; tea, 1s. 6d. per lb. The price of potatoes varies considerably, and ranges from 4s. to 9s. per ewt.; the average for the last ten years has been about 7s. House-rent in Sydney and its suburbs, for dwellings occupied by the labouring classes, ranges from 7s. to 10s. per week for three-roomed dwellings, to about 10s. for those with four rooms, and correspondingly higher rates for increased accommodation.

The value of private wealth in New South Wales is estimated at over
Private Wealth £375,750,000, or between £250 and £260 per head. Relatively speaking,
and its the distribution of private wealth is very wide, and is indeed without parallel
Distribution. in any other country in the world, more than one person in every six being a property owner. The total private income of the inhabitants of New South Wales has been estimated at between £65,000,000 and £70,000,000 annually, or over £45 per inhabitant. It has been estimated that of the total male breadwinners in New South Wales about 6·6 per cent. have incomes in excess of £200 a year. The average annual income of the male breadwinners who receive less than £200 per annum is £103.

In New South Wales there are two great savings banks, the Government
Savings Banks Savings Bank and the Savings Bank of New South Wales. In 1905 the
and depositors numbered 355,714, and the deposits amounted to £13,498,252,
Insurance. an average of £37 18s. 11d. per depositor. In either bank a shilling, or any multiple of a shilling, may be deposited. In no single depositor is allowed in the Savings Bank of New South Wales, as is evidenced by the fact that in 1904, with a population of a little under 1,500,000, the policies numbered 440,005, and the annual premium income was assured, inclusive of bonus, £3,845,577. The total amount At the end of 1903 there were over 1,000 branches of different Friendly Societies in New South Wales, whose members



numbered 94,044. The services which these societies render to the community by encouraging self-help, and relieving cases of distress which would otherwise call for State aid, have been fully recognised by the Government, and a number of privileges are allowed to societies whose rules have been certified to by the Registrar as being in accordance with the law.

In order to make provision for those citizens who have, during the prime of life, helped to bear the public burthens of the State by the payment of taxes and by opening up its resources by their labour and skill, and who, by reason of old age, are no longer able to work for their livings, a system of old-age pensions was inaugurated in 1901. Under this scheme, any person who is 65 years of age, has resided in New South Wales for twenty-five years, and satisfies the conditions as to good character, is entitled to a pension of £26 per annum. If the pensioner possesses any independent income or property, the pension is reduced by £1 for every £1 of the pensioner's own income in excess of £26 per annum, and by £1 for every £15 worth of property which he possesses. When a husband and wife, who are each entitled to the pension, are living together, their joint pensions cannot amount to more than £39 per annum, but if they are living apart, under a decree of the Court or a deed of separation, they are entitled to the ordinary rates.



SUGAR-CANE NORTH COAST DISTRICT.

Persons over 60 but under 65 are entitled to pensions if incapacitated by sickness or injury from earning their livelihood. The annual cost to the State of the old-age pensions amounts to about £500,000, and in December, 1905, 20,737 persons were receiving pensions.

Despite the wider distribution of wealth, and the absence of class distinctions and violent contrasts between rich and poor, which form so distressing a feature of too many of the social systems of the old world,

New South Wales, like every other country, is called upon to make provision for her aged, and sick, and needy, although the hereditary pauper class has no existence within her borders. For the relief of the sick, hospitals exist in the metropolis and in every important country town, nearly all of which are subsidised by the Government, and there are seven hospitals for the insane under the immediate control of the State. A number of Government asylums also exist for the succour of the destitute, the great majority of whom are persons of very advanced years, who are unable to



PUNT ON THE RIVER MURRAY.

work; and there are besides private charitable institutions. The charge of destitute or neglected children is entrusted to the State Children's Relief Board, who have pursued the boarding-out system with very successful results, and there are also three reformatories.

The criminal statistics of New South Wales show that for a long period crime has been decreasing in a most satisfactory way. During the period

Crime Diminishing. 1880-84 the number of apprehensions per 100,000 of the population was 5,140, and this had sunk to 2,774 during 1900-04; and though the population had in the interval swelled by more than half-a-million, the actual number of apprehensions per annum had decreased by nearly 2,500. In the vast majority of cases, of course, these apprehensions represent comparatively trivial matters, which were dealt with summarily by a magistrate; but when one turns to the statistics of the committals for trial, comprising the more serious classes of offences, the improvement is still more noticeable. During the period between 1875-79 and 1900-1904 the average annual committals per 100,000 of the population decreased from 238 to 97; and fewer persons are now committed for trial annually than twenty-five years ago, when the population was less than half its present number,

The people of New South Wales are amply provided with parks and public recreation reserves. In the city of Sydney 696 acres (or 24 per cent. of the whole city) is devoted to parks, squares, and public gardens ; and there is in addition to this the Centennial Park—a magnificent recreation ground covering 552 acres. The suburban municipalities have, besides Centennial Park, about 3,335 acres of parks and reserves. There is also the splendid National Park, about 16 miles south



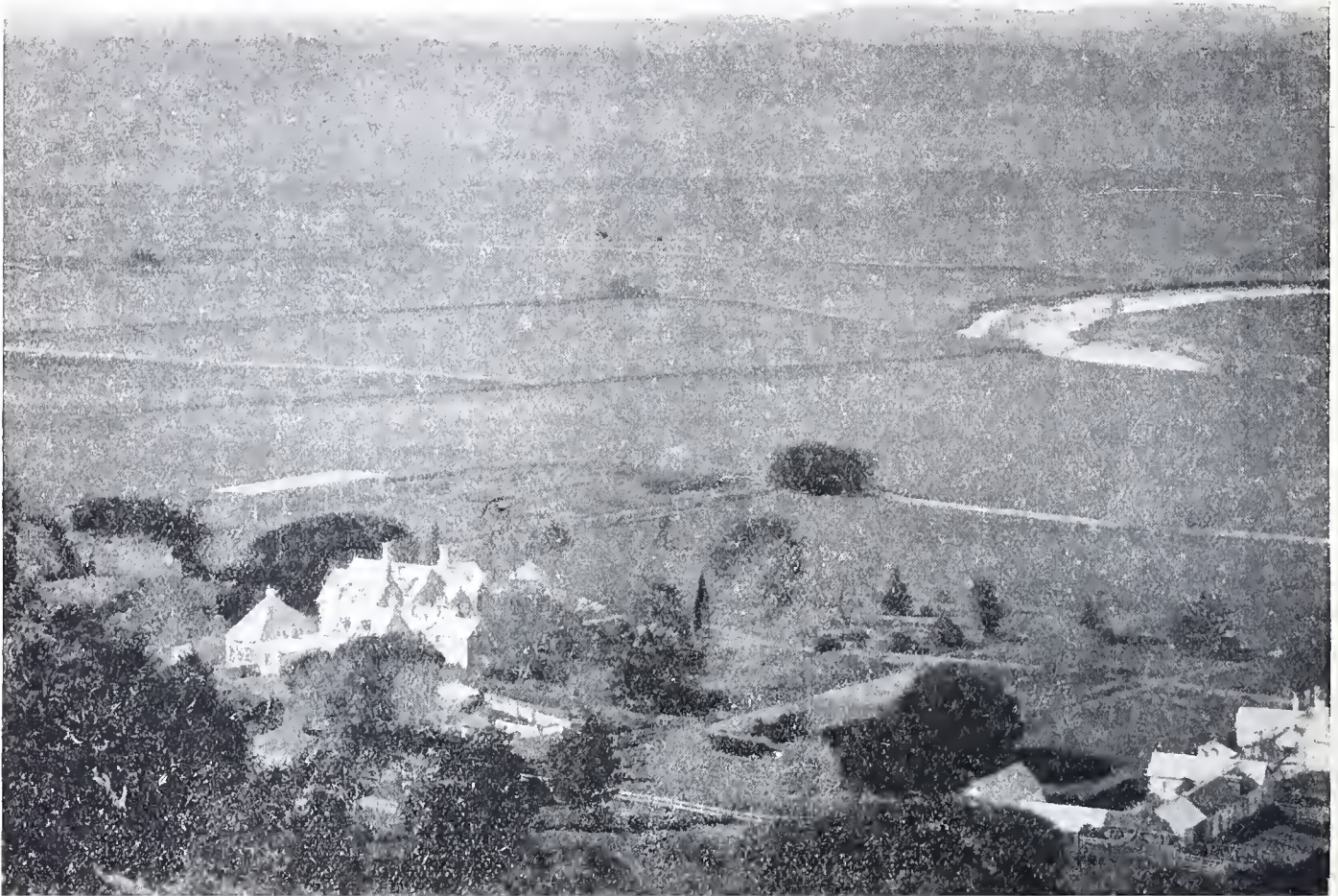
LADY CARRINGTON DRIVE, NATIONAL PARK.

from the metropolis, consisting of nearly 34,000 acres, surrounding the picturesque bay of Port Hacking; and 10 miles to the north of Sydney lies the Kuring-gai Chase, comprising 35,300 acres of beautiful forest country. An area of 248 acres at Kurnell, on Botany Bay, the historic landing place of Captain Cook, was rescued from private ownership, proclaimed as a recreation reserve, and dedicated to the people for all time, chiefly by the efforts of the present Premier, Mr. J. H. Carruthers. In the country districts, reserves, extending in some cases over 1,000,000 acres, have been proclaimed as temporary commons, whilst considerable areas have been from time to time dedicated as permanent commons attached to townships, which are otherwise well provided with parks and reserves.

The immigrant—and especially the Englishman—who is leaving the shores of the United Kingdom for New South Wales, is coming to a country whose legal system closely reproduces that of the land from which he is departing, and whose laws are in great measure precisely identical with those under which he has hitherto lived. In 1828 the whole of the law of England, which was then applicable to the conditions of the Colony, was brought into force in New South Wales, and though Imperial legislation passed since that date has not affected New South Wales law (except in comparatively few special cases), many Imperial statutes have been adopted by the local legislature, and the principles of the English common law have, by their very nature, followed in New South Wales a course of development exactly identical with that which has obtained in England, except in cases where local enactments have intervened to break the continuity. The land law of New South Wales (apart from the statutes dealing with the alienation of Crown lands) is very similar to that of England. One important difference is that in cases of intestacy a person's land goes to his next of kin, in the same way as his goods and chattels, instead of descending to the heir as in England. The "Torrens" system of land registration, which was introduced as from the beginning of 1863, has proved very popular. The system is somewhat similar to that which obtains in the county and city of London under the English Land Transfer Acts, 1875 and 1897, except that it is quite optional for private owners to "bring the land under the Act," or leave it under the old system, as they choose. The great advantage which is derived from registration lies in the certainty which attaches to registered titles, and the facility with which registered land can be transferred or otherwise dealt with, a single sheet of parchment (the "certificate of title") being substituted for all the bulky deeds of the old system. Copyhold tenure and game laws are alike unknown in New South Wales. In 1902 an Act was passed by virtue of which an illegitimate child, whose parents afterwards intermarry, is by virtue of such marriage, legitimated as from birth, provided that at the child's birth there was no legal impediment to its parents' marriage, and that the child is registered after the marriage by the father. Marriage with a deceased wife's sister is legal



ICE AT MOUNT KOSCIUSKO.



LIMESTONE PLAINS, FROM DUNTROON, QUEANBEYAN DISTRICT.

in New South Wales. Vaccination is not compulsory in the State. As a result of the Early Closing Acts of 1899 and 1900, most shops in the metropolitan, Newcastle, and country shopping districts are required to close on one week day at 1 p.m., on another at 10 p.m., and on the remaining four at 6 p.m. Later hours are allowed in the case of certain classes of shops. Public-houses must close at 11 p.m. on week days and altogether on Sundays.

New South Wales offers an unrivalled field for the tourist, holiday-maker, **Unrivalled** and health-seeker. No country in the world offers to the traveller such a **Tourist Resorts.** wide range of climate, such a wonderful variation of interesting scenery, or such a wealth of entrancing easily-accessible waterside resorts as New South Wales. Complete and rapid changes of air can be easily obtained within the borders of the State—from the normal temperate climate to the snows of Kosciusko and the icy waters of

the Alpine streams, or to the lazy warmth of the tropical fringe touching the Queensland border. With a death-rate of only 10·13 per thousand it will be readily recognised that the climate is one of the healthiest in the world, and already several portions of New South Wales have achieved considerable reputation as health resorts. There are a number of springs and hot-water baths in different districts, among others the thermal spring at Yarrangobilly Caves, the chalybeate spring at Mittagong, and the Moree artesian baths, with a temperature of 114 degrees, the latter being credited with the power to cure rheumatism. In more than one district trout-fishing equal to that of Scotland may be obtained, and in many parts of the country there is splendid shooting. Poets have sung the beauties of Sydney Harbour, the magnificent estuary of Port Jackson, where the infant Commonwealth was cradled over a century ago, and which is generally admitted by travellers to be the finest harbour in the world. The Blue Mountains, 40 miles west of Sydney, present some extraordinarily fine scenery in the shape of rugged gorges, profound depths, immense valleys, waterfalls losing themselves in mist, and views merging into indefinable distance. In these mountains are situated the Jenolan Caves, said to be the finest wonder caverns in the world. The caves exist in an extensive limestone belt, in reality an old Silurian coral reef, in which, in the course



ROCK-LILIES.

of untold ages, underground streams have hollowed out the caverns. The wealth of stalactites, shawls, and calcite crystals in the caves call up to the minds of tourists visions of some delightful palaces in fairyland. There are other caves in the southern portion of the State, situated in the same limestone belt, at Wombeyan and at Yarrangobilly. The latter may be viewed in a round trip which includes a visit to the summit of Mount Kosciusko, the highest peak in Australia. Some typical Australian coaching will be enjoyed on this tour. Snow-clad Kosciusko presents the oldest land surfaces known to geologists on the globe, and is intensely interesting on this account to the student, while its wild and craggy ridges dipping steeply to almost fathomless gorges, and its extravagance of magnificent panoramic views which extend, owing to the clear Australian atmosphere, for scores of miles in every direction, make the visit one of surpassing wonder to the most careless tourist. A feature of interest on this tour is that the traveller may ascend to the very summit of the snow-clad mountain on horseback. There are many of the districts of New South Wales worthy of inspection by the tourist, among them being the beautiful Illawarra, where sea, jungle, and mountain meet, and which contains the world-famed Bulli Pass; the Hawkesbury, known to tourists as the "Rhine of Australia," which is quite close to the city of Sydney; the New England tableland, with its well-stocked trout streams; the Nowra - Moss Vale district, with its magnificent gorges and delightful mountain drives; and the wonderful North Coast, with the "first flush of the tropics in its blood," and with a climate so marvellous that sugar-cane and English fruits flourish one beside the other. Good, cheap, and easy communication is an outstanding feature of the New South Wales tourist system. Splendid sport is available at numberless places for the fowler and the angler. New South Wales is the land of real holiday and enjoyment. The hotel accommodation is good and cheap, Sydney's best hotels being equal to the best in London, and their rates being very considerably below English charges.





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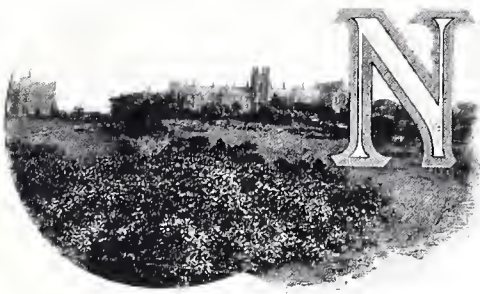
259, George-street, SYDNEY.

CHAPTER III.

Physical Features.

By J. M. TAYLOR, M.A., LL.B.

(DEPARTMENT OF PUBLIC INSTRUCTION).



NEW South Wales is the mother State of the Australian Commonwealth, and was the first portion of the continent to be occupied by settlers of the British race. It fills about one-ninth of the continent, and is by far the richest of the States in pastoral, agricultural, and mineral wealth.

The State covers an area of 310,700 square miles, and is thus nearly three times the total size of the British Islands. It lies between Queensland and Victoria, and within its limits are included the best land, the most charming scenery, and the most important rivers of Australia. On the east its extensive coast line is washed by the waters of the Pacific Ocean, and the State stretches thence inland for nearly 700 miles to the eastern border of South Australia. The coast, whose appearance in 1770 delighted the eyes of its first explorers—Captain Cook and Sir Joseph Banks—consists of a succession of frowning cliffs, low grassy promontories, and sparkling sandy beaches, broken at intervals by picturesque bays and roomy river estuaries. The absence of dangerous reefs and currents along the shores render, the navigation of New South Wales waters an easy task for the mariner, while lighthouses have been erected on all the more prominent headlands as a safeguard against shipping disasters.

New South Wales possesses several fine natural harbours, one of which—
Harbours and Estuaries. Port Jackson, on whose shores the city of Sydney is situated—stands unsurpassed among the ports of the world for size, beauty, and shipping facilities. Visitors from all quarters of the globe have written enthusiastically of the natural beauties of Sydney Harbour. The late Anthony Trollope, for example, describes it as “so inexpressibly lovely that it makes a man ask himself whether it would not be worth his while to move his household gods to the eastern coast of Australia, in order that he might look on it as long as he can look at anything.” Among other breaks in the coast—Port Stephens, Broken Bay, Botany Bay, and Twofold Bay, are little

inferior to Port Jackson, while several small ports, estuaries, and roadsteads afford abundant facilities for shipping, and are safe harbours of refuge against the perils of the sea.

The mouths of several of the coastal rivers are sometimes hampered by sand accumulations known as bars; but this evil has been largely minimised by systematic dredging, carried out by the Government, by whom, also, extensive training-walls have been constructed in many places to increase the scouring effect of the tides and river outflow, and thus remove at length these hindrances to shipping.

Several lakes or lagoons are met with along the coast. Besides rendering this part of the country more picturesque and increasing the number of tourist resorts, these fine sheets of water are, in almost every case, the seats of thriving fishing industries.



THE GROSE VALLEY, BLUE MOUNTAINS.

Within the limits of New South Wales may be seen some of the oldest land surfaces of the whole world—many parts of the country as it exists to-day having stood high and dry when hundreds of feet of restless ocean rolled over the highest shoulders of the Alps and Himalayas. The State of New South Wales falls into three well-marked natural sections:—
(i) a narrow coastal strip of well-watered, undulating country; (ii) the tablelands, running

from north to south throughout the whole length of the State, and forming portion of a belt of highlands skirting the eastern and south-eastern portions of the continent; and (iii) the western plains, which extend west and north from the foothills of the tablelands to the borders of South Australia and Queensland.

The Coastal Strip. The coast district is a strip of hilly, well-watered, and generally fertile country, with an average width of between 30 and 40 miles.

In the Hunter River Valley—its widest portion—it stretches back at least 150 miles from the ocean, while at Clifton, about 40 miles south of Sydney, the tableland comes to within a few yards of the Pacific, from which, however, it gradually recedes as it works south. In doing so it skirts the dairy-farming and coal-producing district of Illawarra—a much-frequented tourist resort, remarkable for its grandly frowning cliffs and creaming beaches, as well as for the almost tropical luxuriance of its stately palms, tree-ferns, and other kinds of abundant native vegetation.



Many mountain spurs stretch eastward from the Main Dividing Range towards the ocean. All of these, besides serving as boundaries between the several coastal river valleys, take their share in the work of intercepting and wringing dry the vapour-laden winds that blow landwards from the Pacific. They thus help to make the coastal district the well-watered fertile region that it is for the most part, with an annual rainfall, varying from 40 inches in the extreme south to 70 inches in the north. Among the more important of these lateral ranges are the Macpherson Range, a rugged mountain wall which serves as part of the boundary between New South Wales and Queensland; the Macleay, Hastings, Mount Royal, and Hunter Ranges further south; while, west of Sydney are the Blue Mountains, which broaden out into the well-known rugged plateau, whose delightfully invigorating atmosphere and picturesque surroundings attract thousands of visitors from all parts of Australia during the summer months.

The rivers belonging to the seaboard of New South Wales spring either from the Great Dividing Range—the main watershed of the State—or from its easterly extending spurs. They are all permanent streams; many of them are short, the most notable exceptions being the Clarence (240 miles), Macleay (200), Hunter (200), Hawkesbury (330), and the Shoalhaven (260)—all fine streams, navigable for varying distances for fairly large steamers, and skirted in their lower courses by low-lying alluvial flats of great depth and fertility. After periods of sudden and exceptionally heavy rainfall the whole of the coastal rivers are liable to overflow, sometimes doing damage to crops and settlements. Although these inundations often work havoc while they last, nevertheless, the top-dressing of silt which they leave behind when

the flood-waters recede greatly increases the crop-producing capacity of the alluvial lands along the river banks.

The greater part of the coast district has been brought under cultivation. Dairy-farming has gradually become the leading industry throughout the greater part of the coast; but in addition to this sugar-cane is grown on the warm northern alluvial lands skirting the Tweed, Richmond, and Clarence Rivers. Maize, oats, and lucerne are the chief crops farther south, as far as the Hunter; while in the Parramatta and Ryde districts—contiguous to Sydney—oranges, lemons, and stone fruits are extensively grown, both for local consumption and for export. In the parts of the coast district lying close to the tablelands, much fertile, heavily timbered land—now unoccupied save by dense forests of hardwood—will probably, in the near future, be brought under tillage.

But valuable as are the agricultural and pastoral resources of the coast district, another great material heritage of the people of New South Wales is the magnificent series of coal



CAMEL TRAIN CARRYING WOOL IN THE FAR WEST.

deposits of this part of Australia. Underlying the whole tract of country, extending from Port Stephens to the Clyde River, and stretching in a south-westerly direction past Moss Vale, and westerly under the Blue Mountains to Lithgow, are splendid seams of the finest coal for steam and gas-making purposes.

The presence of these vast coal deposits marks out unmistakably this part of New South Wales as the great future manufacturing region of Australia, with Sydney as its natural centre. At present the chief coal ports of the State are Newcastle and Wollongong—the industrial centres of the Hunter and Illawarra districts,—while large quantities of Lithgow coal are sent by rail to Sydney for shipment. In the Clarence-Richmond district,* in the north-eastern portion of the State, there are valuable coal-seams also; but they are, as yet, unworked on account of their distance from rail and seaport.

The indigenous vegetation of the coast is, as a rule, varied and luxuriant, but with the march of settlement, it is necessarily giving place by degrees to pasture grasses. Over wide areas, especially in the deep gullies near the heads of the various coastal rivers, and in the neighbourhood of numerous old-time basaltic overflows, the hill slopes are clothed with a luxuriant, semi-tropical natural drapery—stately palms and tree-ferns, acacias, gums, banksias, and fig-trees, uniting to form a picture charming, not only to the tourist and botanist, but to the practical, prosaic searcher after rich grazing and agricultural lands.

Inland from the coastal strip lie the Tablelands—a plateau tract forming
The portion of a more extensive series of uplands which run parallel to the coast
Tablelands. from North Queensland to the centre of Victoria, with a southerly-extending offshoot dipping under Bass Strait and reappearing in the island State of Tasmania. The tablelands vary from about 30 to over 100 miles in width, and are broken into two distinct sections—the northern and the southern—by the far-extending water-worn valleys of the Hunter—Goulburn, and Peel Rivers. They serve as a platform along which winds the Great Dividing Range, the main water-parting of the country. This well-marked mountain mass runs from north to south through the whole length of the State. It bears different names in different parts, *e.g.*, the New England Range, in the far north; the Liverpool Range, immediately north of the Hunter-Goulburn Valley; the Main Range, west of the Hunter-Goulburn and Hawkesbury River Valleys; the Cullarin Range, in the Goulburn district; the Gourock and Monaro Ranges, further south; while the highest and most southerly portion, containing Mount Kosciusko (7,328 feet), the highest peak in the continent, is called the Muniog Range. Steep, frowning precipices, as a rule, mark the eastern face of both tablelands, while their slope to the plains of the interior is long and gradual. As a result, many of the coastal rivers are swiftly-flowing torrents, while long, sluggish courses are the most marked feature of the western streams, all of which belong to the Murray-Darling river system.

On the eastern side, the north coast rivers (Richmond to Manning), fed by a regular and heavy rainfall, have cut their way to the sea, easterly-stretching Southern Tableland, extends in one part This occurs, as already at the northern end of where there is to be of mountain, sea, and world can produce. in some parts known as



THE SUMMIT OF MT. KOSCIUSKO.

deeply into the escarp-Tableland, and forge between the numerous mountain spurs. The unlike the Northern, eastward to the ocean. mentioned, near Clifton, the Illawarra district, seen such a combination jungle as few parts of the Level, park-like tracts—plains, and in others



downs—are met with on both tablelands. They are devoted mainly to sheep-farming, wheat-growing, and the cultivation of fruit.

A prominent feature of the Southern Tableland is its valleys—a series of huge gorges, resembling the far-famed cañons of the United States. Among the most notable of these depressions are the Grose, Kanimbla, and Jamieson Valleys in the Blue Mountains, and the Valley of Burragorang further south; and it is interesting to note that all of them

have been hollowed out in the course of untold ages by the persistent action of running water. The views afforded from the most frequented points of vantage on the bounding cliffs of the Blue Mountain valleys are truly magnificent. The cliffs forming their sides are composed of horizontal strata of iron-stained sandstone, and “are so absolutely vertical that in many places a person standing on the edge and throwing down a stone can see it strike the trees in the abyss below. . . . If we imagine a winding harbour, with its deep water surrounded by bold cliff-like shores, to be laid dry, and a forest of graceful tree-ferns, sassafras, and giant eucalypti” to spring up on its sandy bottom, we should have the appearance and structure they exhibit. Into these chasms tumble several mountain torrents, many of which become lost in gauzy mist before reaching the bottom, while around nearly all of them the scenery is wild and romantic. The best-known of these charming cascades are those of Govett’s Leap, Katoomba, Leura, and Wentworth Falls—all within easy reach of Sydney by rail. Not only do the Blue Mountains possess the charm of beautiful scenery, but their cool invigorating atmosphere attracts thousands of visitors from the warm coast district during the summer months.

Both tablelands are crossed from south to north by railways, and in the course of a train journey on either of them, delightfully varying landscapes are met with. In some places the mountains consist of sandstone strata, monotonous in their regularity, in others wild granite masses in all stages of weathering. At intervals a sudden change to a luxuriant vegetation indicates the presence of decomposing basalt, every sheet of which is an ancient lava stream, pointing to a time when volcanic fires smirched the hillsides of Eastern Australia, whose convulsions shook the continent of that period from end to end, and whose escaping gases and ashes darkened the air. The decomposing products of these eruptions have been responsible for the marvellously rich patches now met with, for example, in the New England district, along the eastern and western flanks of both tablelands, and even farther away in the Gwydir-Namoi black-soil plains, whose very richness and depth render the tasks of teamsters crossing them in wet weather, with heavily-laden wool and grain waggons from the sheep runs and wheat-fields of the north-west, a most trying one.

Throughout the tableland between Bathurst and the Kosciusko Plateau there stretches an extensive limestone belt, in which occur the well-known Jenolan, Wombeyan, and Yarrangobilly Caves. Towards its southern extremity, the tableland country becomes wild and broken, and not far from the Victorian border it is capped by a group of peaks among which Mount Kosciusko, the highest mountain in the continent, takes first rank. The name Kosciusko is due to Count Strezlecki, an accomplished Polish traveller, who ascended and explored the surrounding region in 1840. In his view the crest of the peak he climbed bore a striking resemblance to the tumulus erected at Cracow over the remains of his famous countryman, the Polish patriot Kosciusko. This hoary, weather-beaten crag is probably one of the oldest land surfaces in the world, and, grand as it is to-day, in ages past it must have been incomparably grander, for it is, in truth, but the abraded stump of an old-time majestic volcano, whose fires have long been extinct, while the glaciers that once chiselled its hill sides and carved out the beds of the Kosciusko tarns of to-day, are an almost forgotten factor in the moulding of the continent, as we now know it. Mount Kosciusko was standing high and dry in the full strength of mountainhood, when in recent geological time a deep sea extended through



RAILWAY BRIDGE OVER THE HAWKESBURY RIVER.

Central Australia, from the Gulf of Carpentaria to the Southern Ocean, washing against the present foothills of Eastern Australia, and when hundreds of feet of deep blue waters covered the topmost hill slopes of the loftiest mountains that Europe and Asia can boast. At the time of writing a progressive Government has undertaken the task of cutting a roadway right to the summit of Kosciusko, in order that its geological wonders and scenic marvels may be brought more easily within the reach of the tourist. It is possible now to ride to the top of the mountain on horseback, and the completion of the road, which may be looked for in the course of a few years, will enable the visitor to sit in a vehicle and be driven almost to the summit of Australia's highest mountain.

The whole of New South Wales lying west of the tablelands consists of
The Western Plains. a vast plain, with a gradual slope towards the Darling River, beyond which the country stretches with a gradual rise to the borders of Queensland and South Australia. Over wide areas the Western Plains are almost as level

as a bowling green, so that the task of constructing the numerous railways that serve this part of the State, was beset with practically no engineering difficulties. Trifling elevations and belts of scrub-land occur at intervals, and the only elevations of any importance are the silver-bearing Barrier Ranges, close to the South Australian frontier, and the Grey Range, further north. The rainfall varies from about 10 inches in the extreme west, to about 24 inches in the portion immediately west of the tablelands. In consequence of these conditions the far west is only suitable, without irrigation, for sheep-farming, while the more easterly portion, stretching from Albury north to Moree, is the huge wheat belt of splendid productivity, destined to make New South Wales one of the greatest grain producers in the world.

The soil of the plains consists almost entirely of alluvial deposits, which have, in the course of ages, been carried down from the tablelands by the rivers, and spread over its surface. Some portions—notably the black-soil plains in the north-eastern section of the region, are among the deepest and most fertile alluvial soils in the whole world. In favourable seasons the plains are clothed with rich natural grasses, on which millions of sheep are depastured, and even in dry seasons noted as well for its drought-resisting valuable food for tory results that have of the Government connection with some of the west show that,



LONG BAY.

the salt-bush, a shrub nutritive as for its ities, is found to be a shecp. The satisfac- attended the working irrigation farms in of the artesian wells when the problem of conserving the waste water will have been satisfactorily solved, the agricultural possibilities of the far west will be very great, for water alone is wanted to make that part of the State highly suitable for the growing of fruits and vegetables.

Within the Western Plains occurs the famous Broken Hill region, one of the most extensive and productive silver-fields of the world ; the rich Cobar copper-mining district ; and the White Cliffs opal-fields, which yield some of the finest noble opal as yet found anywhere.



AN ILLAWARRA SCENE.

The rivers of the plains belong to one great system—that of the Murray-Darling. They are in many cases often almost dry for many months of the year, and notwithstanding their far-extending catchment areas, are narrow and shallow, except when in flood, and in many cases flow in summer for considerable distances, more through than above the extensive accumulations of sand, shingle, and drift which compose their beds. The fall of the western rivers is but slight—not more than about 3 feet per mile,—and their courses are long and sluggish, while, taken in comparison with the streams of the coastal district, their volume is by no means great. Floods occur at intervals in the rivers draining the plains, but as flooded conditions are very rare, most of the streams consist often of a chain of waterholes for the greater part of the year, while hardly one of the longer tributaries of the Darling reaches the main stream except during periods of continuously heavy rainfall.

The Murray-Darling river basin includes the whole of the western portion of New South Wales, stretches northward far into Queensland, and embraces a very large portion of northern Victoria. The head streams of the Murray spring from the Kosciusko Plateau, where, owing to a large and constant rainfall and the accumulation of snow on the hill-slopes for nine months of the year, an abundant water supply is available. For this reason the Murray has a greater volume than any other Australian river, and it has never been known by either blacks or whites to have stopped running. The stream is navigable for small river steamers as far as the town of Albury, a distance of over 1,400 miles from its mouth. The Murray receives the united waters of the Murrumbidgee and Lachlan Rivers—two large streams draining the important pastoral and wheat-growing district of Riverina—while lower down its course it is joined by the Darling. This long Nile-like river carries to the sea the waters of several important streams which, taken together, drain an extensive basin, stretching from central New South Wales northward into Queensland. The Darling, like most large Australian rivers, is known by different names in different parts of its course, the term Darling being only applied to that part of the river below the Bogan junction. Its longest head stream is the Condamine, which has its source in the Darling Downs, a rich pastoral district in Queensland, whence it sweeps in an almost semi-circular fashion into New South Wales, which it enters under the name of the Culgoa. About 20 miles above the important stock-trucking railway town of Bourke, the Culgoa receives the united waters of the Barwon, Bogan, Macquarie—Castlereagh, Namoi, and Gwydir, and thence pursues a south-westerly course, under the name of the Darling, till it joins the Murray at the township of Wentworth. A remarkable circumstance in connection with the Darling is the fact that from the Culgoa junction to its confluence with the Murray this great watercourse has not a single permanent tributary—the Paroo terminating in swamps about 40 miles north-west of Wilcannia, and, like the Warrego, only reaching the main river during great floods. Its banks, too, are in many places higher than the surrounding plains; indeed, the river bed itself, though from 30 to 40 feet below the bank, is in some places but little lower than the general level of the adjacent country, so that during floods the river banks are often the only



COOGEE.

dry lands visible for miles. During periods of long-continued dry weather the river dwindles above Menindie to a succession of reaches, with little or no flow between them, and in some places exists only as a chain of waterholes. During freshets the Darling is navigable for small river steamers as far as Walgett, distant 2,345 miles from the sea, and its total length has been estimated at 3,282 miles. Almost all the plain

country within its basin is occupied by squatters as sheep runs, and much of the station produce is sent down the stream to Victoria and South Australia for export.

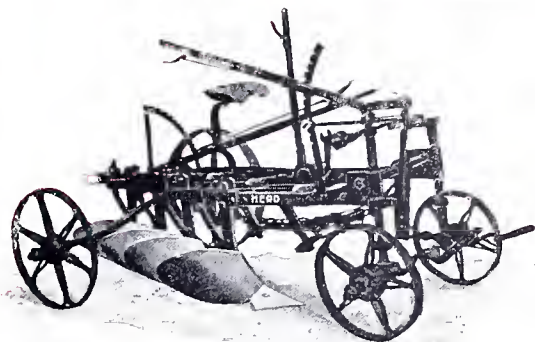
The upper portions of most of the tributaries of the Darling and Murray run through gold-bearing districts, and in several parts of the Macquarie dredging for gold in the river bed is carried on as a payable industry.



CROSSING A CREEK, NEAR MULLUMBIMBY, NORTH COAST.

CHAMPION FARM TOOLS

Are Built at Meadowbank, near Sydney, New South Wales



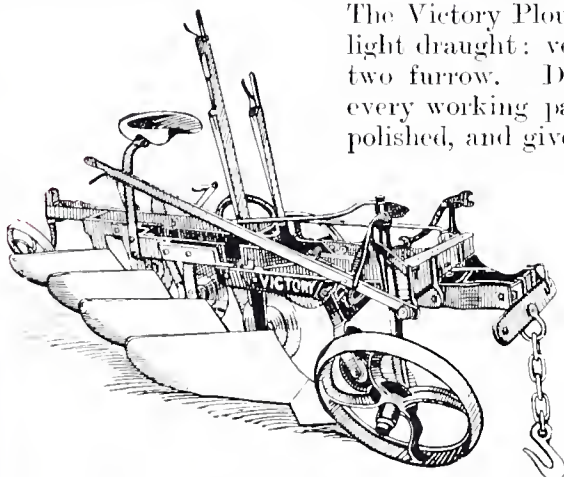
4-FURROW STUMP JUMP PLOUGH. £25.

Like the Plough Stump Jump Harrows, are good workers in all land; being flexible, they pulverize the ground; are easily cleaned and very strong; the wheels are a special feature.



SET OF 4-LEAF STUMP JUMP HARROWS. COMPLETE £6 5s.

The Victory Plough is easily first in its class; does perfect work with light draught; very rigid and strong; quickly convertible to three or two furrow. Driver rides on plough and has perfect control over every working part. The mould boards are special shape, chilled and polished, and give unfailing satisfaction.



4-FURROW VICTORY RIDE & GUIDE £20.

Our Harvester enables a Farmer to take off his crop single handed, quickly, and with ease, at a cost of about 1s. per acre. The sample is perfect, and no grain need be lost. Three or four horses are sufficient. The machine is very simple and easily kept in order, and with care will last a lifetime.

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LOCAL IMPLEMENT FACTORY,
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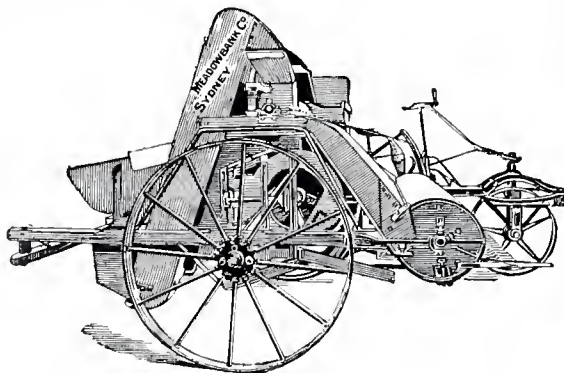
These Ploughs do first-class work with light draught in any soil—hard or soft. They work equally well amongst stumps and stones as in thoroughly cleared land. Farmers using this Plough save at least 10s. per acre in clearing, and are enabled to grow a crop on timbered land the first year.

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Built to order for Cash or Time Payment.

SEED DRILLS & CULTIVATORS to sow and fertilize all seeds from Lucerne to Broadbeans.

MOWERS and BINDERS, STRIPPERS and WINNERS, THRESHERS or STRIPPER-HARVESTERS will take off any crop, light or heavy, short or tall.



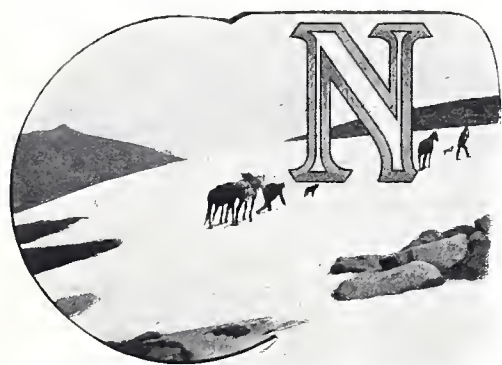
CHAMPION HARVESTER

THE MEADOWBANK MANUFACTURING COMPANY.

Government and Finance.

Government of the Commonwealth—Government of New South Wales—Commonwealth and State Franchise—Naturalisation—Local Government in New South Wales—Commonwealth and State Finance.

BY F. R. JORDAN, B.A.



EW South Wales, like its fellow States of the Commonwealth of Australia, was, prior to 1901, a British self-governing Colony. The question of the union of the whole of Australia had, however, long engaged public attention, and after many years of discussion a measure was prepared by Australian statesmen in 1891, providing for the federation of these Colonies. This formed the groundwork of the Constitution Bill, which was eventually adopted in 1899 by the Colonies of New South Wales, Victoria, Queensland, South

Australia, and Tasmania, and by Western Australia in 1900, and was transmitted to the Imperial Parliament, by which it was passed into law under the name of "The Commonwealth of Australia Constitution Act." By virtue of this Act the Colonies of the Australian Continent and Tasmania have been, since 1st January, 1901, joined in a federal union called "The Commonwealth of Australia," the constituent parts being no longer termed "Colonies" but "States." British New Guinea was transferred to the control of the Commonwealth in 1901.

Except in so far as the Commonwealth Parliament is expressly empowered to modify certain provisions, the Constitution may not be altered in any respect unless the proposed change be approved in a majority of the States by a majority of the electors voting therein, and by a majority of all the electors voting throughout the Commonwealth, after having been previously approved by the Federal Parliament.

The Constitution provides that the seat of government of the Commonwealth shall be situated in New South Wales (but not within 100 miles of Sydney), and that until a site be chosen for the capital the Federal Parliament shall meet in Melbourne. The matter of the choice of a site has already engaged the attention of the Parliament of the Commonwealth, but pending definite action in this direction, both Houses continue to sit in Melbourne.

The Commonwealth of Australia forms an integral part of the British Empire. The Parliament of the United Kingdom has sovereign power over every part of the King's dominions, and political relations with foreign countries (including those of peace and war) are solely within the control of the British Government. But, just as, prior to federation, full powers of self-government in local matters had been enjoyed by each separate Colony, so now each State retains all its former powers of legislation and administration, except in certain matters, over which exclusive control has been surrendered by each and all of the States to the Commonwealth; and the powers of the Parliament of the Commonwealth and of the Parliaments of the different States, taken together, extend to the making of laws for the peace, order, and good government of Australia in all cases whatsoever.



GENERAL POST OFFICE, SYDNEY.

The Commonwealth and its States.

Authority is divided between the Commonwealth and its constituent States. The Commonwealth Parliament has power to legislate in a variety of matters which it was deemed desirable should be controlled by a central authority, and should be uniform for the whole of Australia. In certain cases its powers are exclusive. The Commonwealth alone may maintain military and naval forces and impose customs and excise duties (although it is provided in the Constitution that trade between the different States shall be absolutely free). In certain matters the powers of the Commonwealth and of the States are concurrent. Both, for example, may make laws dealing with bankruptcy, divorce, copyright, old-age pensions, and immigration; but if State and Commonwealth legislation conflict, the Commonwealth law prevails. Over all matters in which power to legislate is not by the Constitution given to the Commonwealth, the States have sole control; so that the Parliament of New South Wales has the exclusive right to make laws relating, for example, to public lands, education, internal trade, and generally for the good government of New South Wales in all cases whatsoever, except as above indicated.

THE GOVERNMENT OF THE COMMONWEALTH.

The system of government of Commonwealth and States alike is parliamentary, and is modelled on the institutions of the United Kingdom.

The legislative power of the Commonwealth is vested in the Parliament, which consists of the King (who is represented by the Governor-General), the Senate, and the House of Representatives. The executive power is vested in the King, and is exercisable by the Governor-General as the King's representative.

The Governor-General is appointed by the Crown. His legislative functions are exercised with respect to proposed laws as finally shaped and adopted by the Federal Legislature. Such Bills are presented to the Governor-General for his assent in the King's name, on receiving which

they become law throughout the Commonwealth. The Governor-General may, however, withhold his assent, or may reserve any Bill for the King's pleasure. He may return any Bill, with suggested amendments, to the House in which it originated. The Crown may also disallow any law within one year from the date on which it was assented to by the Governor-General. The Governor-General's executive functions are exercised on the advice of his responsible Ministers. Various specific powers are vested in him by the Constitution: he may summon, prorogue, and dissolve Parliament; and he has the command-in-chief of the Naval and Military Forces of the Commonwealth. The Governor-General has also been invested by the Crown with the



THE BLUE LAKE.

prerogative of mercy in the case of offences committed against the laws of the Commonwealth. But all these powers are exercised on the advice of his Ministers; and even in giving effect to those which may be called discretionary (such as the granting of a dissolution of Parliament), it is necessary for the Governor-General, even if he do not accept the advice of the Ministry of the day, to procure a Ministry which will accept responsibility to Parliament for the course which he adopts. The Governor-General is himself responsible only to the Imperial Government for his official acts.

In the Senate, each of the six States is represented by six members, who
The Senate. are elected by the people of the State voting as one electorate. Senators hold office for six years, half retiring at the end of every three years. This arrangement is designed to make the Senate a permanent body, though provision is made for its dissolution as a whole, in conjunction with the House of Representatives, in the event of a deadlock occurring between the two Houses.

Each State returns to the House of Representatives a number of members
The House of Representatives. proportionate to its population, the minimum number for any original State being 5. In the 1906 distribution, out of a total of 75 members, New South Wales has 27 representatives, Victoria coming next with 22. This House endures for three years from its election, unless it be sooner dissolved.

The Constitution provides that the total number of members in the House of Representatives shall be as nearly as practicable twice the number of the members of the Senate. Members of each House receive remuneration at the rate of £400 per annum.

The two Houses of the Federal Parliament have equal powers, except in the case of money Bills. These must originate in the House of Representatives. Further, the Senate may not amend Bills which impose taxation, or which provide for the ordinary annual services of the Government; nor may it amend any Bill so as to increase any proposed charge on the people. It may, however, suggest amendments in any of these cases; and there is no direct constitutional limit on its power to reject such Bills. The effect is to place the power of the the House of Representatives in the hands of the House of Representatives. Moreover, if the the Senate reject it, or fail to pass it in the form desired by the House of Representatives, then, if the Senate persist in its refusal, the Governor-General may dissolve both Houses simultaneously. If, after the elections, the two Houses be still irreconcilable, the Governor-General may convene a joint sitting to settle the matter. It will be observed that at a joint sitting the members of the House of Representatives, who represent the people of the Commonwealth on a strictly



BRONTE.

population basis, will always outnumber, in the ratio of 2 to 1, the members of the Senate, in which the States are represented equally, without respect to their populations. A Ministry, therefore, which was supported by a substantial majority in the House of Representatives, could bring considerable pressure to bear on a hostile Senate.

The Commonwealth Executive. In the executive government, the cabinet system, similar in its general features to that existing in the United Kingdom, prevails in the Commonwealth as well as in the different States. The leader of the predominant party in the Commonwealth Parliament, and the colleagues of his choice, are appointed by the Governor-General as Executive Councillors and as

Ministers controlling
ments of State.
office so long as it en-
of Parliament;
the leader of the
given an oppor-
a government, or
dissolved, and a
place. The Federal
of the following
for External Affairs,
Minister of Trade
Treasurer, Post-

Minister of Defence, Minister of Home Affairs. There is also a Vice-President of the Executive Council (of which the Governor-General is President), and (at the present time) one Minister without portfolio. No Minister may hold office for longer than three months unless he is a member of either House of the Federal Parliament.



ENTRANCE TO THE DOMAIN.

the great Depart-
Each Ministry holds
joys the confidence
should it lose this,
opposing party is
tunity of forming
else Parliament is
new election takes
Executive consists
Ministers:—Minister
Attorney-General,
and Customs,
master-General,

The High Court. The judicial power of the Commonwealth is vested in a Federal Supreme Court, called the High Court of Australia, and in the State Courts which have been invested with federal jurisdiction. The High Court was constituted by the Federal Parliament in 1903. It acts as a court of appeal from the Supreme Courts of the different States, and also has original jurisdiction in certain matters, including any arising under the Constitution or involving its interpretation. No appeal may be made from a judgment of the High Court to the Judicial Committee of the Privy Council without the special leave of the latter; and no appeal may in any case be made to the Privy Council from a decision of the High Court upon any question as to the limits *inter se* of the constitutional powers of the Commonwealth and its States, or of two or more States, unless the permission of the High Court itself be obtained. The right to appeal direct from the Supreme Court of any State to the Privy Council is still preserved.

Every natural born or naturalised British subject, who is 21 years of age, **Commonwealth** and has lived in Australia for six months continuously, may have his name placed on the electoral roll for the electoral division in which he lives, and **Franchise.** he is thereupon entitled to vote at the election of members of both Houses of the Commonwealth Parliament. The franchise extends to women as well as men, and no person has more than one vote. The Federal franchise is not enjoyed by aboriginal natives of Australia, Asia, Africa, or the islands of the Pacific (except New Zealand), nor by persons who are insane, or attainted of treason, or who have been convicted and are under sentence, or subject to be sentenced, for any offence punishable by one year's imprisonment. Any adult who is entitled to vote for the election of members to the New South Wales Legislative Assembly cannot be debarred from voting at Commonwealth elections.

The right to issue certificates of naturalisation in the Commonwealth is **Naturalisation.** now exclusively vested in the Federal Government. Any foreigner who intends to settle in the Commonwealth, and has resided there continuously for two years immediately prior to his application, may apply to the Governor-General for a certificate of naturalisation, and the Governor-General may, at his discretion, grant the same, on the oath of allegiance being taken by the applicant. Provision is also made for the naturalisation in the Commonwealth of persons who have already been naturalised in the United Kingdom. Aboriginal natives of Asia, Africa, or the islands of the Pacific (except New Zealand) are excluded from naturalisation.



SYDNEY WATER SUPPLY.—PROSPECT RESERVOIR.

THE GOVERNMENT OF NEW SOUTH WALES.

The present Constitution of the State of New South Wales depends on an Imperial Statute which was passed in the year 1855, for the purpose of authorising the Queen to assent to a Constitution Bill which had been prepared by the Legislature of the Colony (then consisting of a single House). The New South Wales Parliament is empowered to alter or repeal any of the provisions of the State Constitution.

The Governor of New South Wales is appointed by the Crown, and his functions in the State resemble those of the Governor-General in the Commonwealth. The Governor assents, on the King's behalf, to Bills passed by the two Houses of the State Parliament; or he may withhold his assent, or reserve any Bill for the certain kinds must, by the Governor, and his other classes of legislation instructions from the British nor's executive powers are his responsible Ministers. tution, empowered to sum- solve Parliament, and to Legislative Council. The mercy, in the case of the laws of the State, is although in all these mat- the advice of his Minis- expressly authorised by such advice, should he see sufficient cause. Any such matter would, however, have to be reported at once to the British Government. The Governor is responsible to the Crown alone for his official acts.



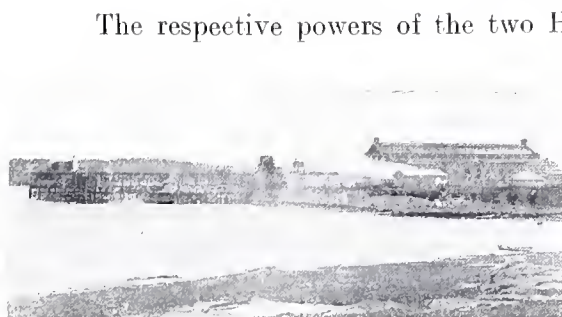
THE BADGE OF THE STATE.

King's pleasure. Bills of Statute, be reserved by power to assent to certain is restricted by his In- Government. The Gover- exercised on the advice of He is, by the State Consti- mon, prorogue, and dis- appoint members to the Crown's prerogative of offences committed against also vested in him. But ters the Governor acts on ters, he is, nevertheless, the Crown to disregard

There are two Houses in the State Parliament—the Legislative Council and the Legislative Assembly—and its powers extend to the making of laws for the good government of New South Wales in all cases whatsoever, subject to the Commonwealth Constitution. State laws purport to be enacted by the King, with the advice and consent, and by the authority, of the two Houses.

The Legislative Council is a permanent body. It is not elective, and its members (at present sixty-one in number) are appointed by the Governor for life.

The Legislative Assembly is elective, and now consists of ninety members, each of whom receives £300 per annum. Each Assembly endures for three years, unless sooner dissolved.



GAS-WORKS, MORTLAKE.

The respective powers of the two Houses of the State Parliament are not defined by the New South Wales Constitution Act, although it is provided that money Bills must originate in the Legislative Assembly. Except in this respect, the powers of the two Chambers in dealing with legislation are equal; but since the Assembly is a representative body, it is upon the confidence of that House that the Ministry depends for its tenure of office.

The executive government of New South Wales is carried on by an Executive Council, presided over by the Governor. The leader of the predominant party in the Legislative Assembly, and colleagues chosen by him, are appointed to the Executive Council by the Governor, and control the great Departments of State. They hold office so long as they enjoy the confidence of Parliament. The State Ministry is constituted as follows:—Colonial Treasurer, Colonial Secretary, Attorney-General and Minister of Justice, Secretary for Lands, Secretary for Public Works, Minister of Public Instruction and Labour and Industry, Secretary for Mines and Agriculture. There is also a Vice-President of the Executive Council, and (at the present time) two Ministers without portfolio.

Every natural-born subject who is of age, and has resided in New South Wales for one year, and within any electoral district for three months, is entitled to vote for the election of members of the Legislative Assembly. This applies also to naturalised British subjects who have resided in New South Wales for one year after naturalisation. The State is divided into ninety electoral districts, each returning one member. Women as well as men are entitled to the State franchise, and no one may exercise more than one vote. The following are excluded from the franchise:—Persons in the naval or military service on full pay (except militia or volunteers); insane persons; persons receiving aid from a public charity; persons recently convicted of certain offences.

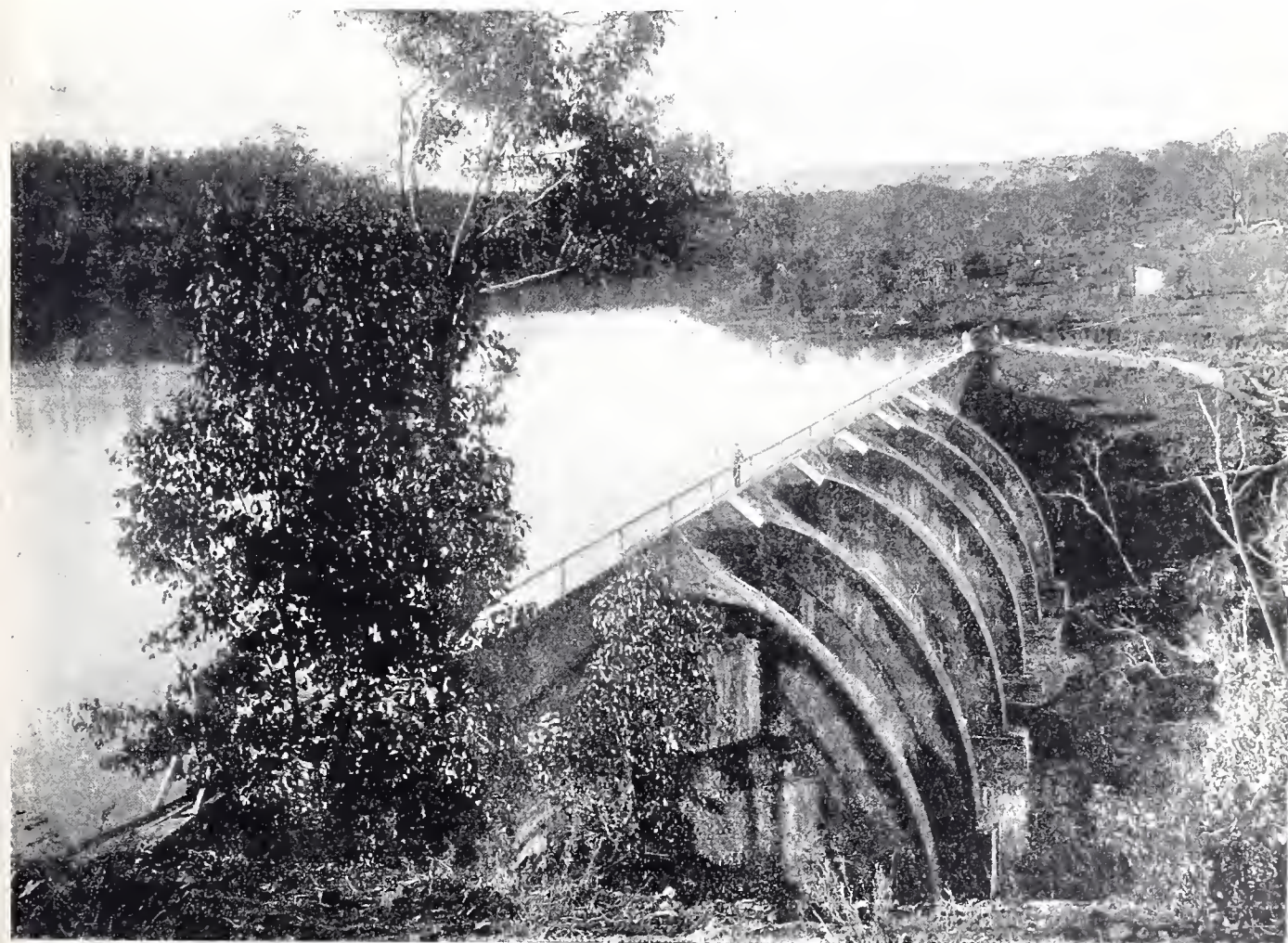
LOCAL GOVERNMENT IN NEW SOUTH WALES.

The history of local government in New South Wales began with the incorporation of the city of Sydney in 1842. This was followed by the formation of several district councils in the country; and legislation passed in 1858 and 1867 made possible the extension of local government to the whole State.

Under the system which existed up to the end of 1905, the application of local government to any part of the State depended entirely on the initiative of the residents. The Municipalities Act, 1897, which deals with the whole matter, provides that the Governor may constitute a municipality on receiving a petition from at least fifty persons who would, on its

formation, be liable to pay rates ; but the creation of any such municipality may be prevented by a counter-petition of a greater number of persons who would be similarly liable. On the formation of a municipality, occupiers, lessees, and owners of ratable property are entitled to vote for the election of a municipal council, the number of votes exercisable by each elector varying according to the annual value of his property. One-third of the members of the council retire each year. The powers of the council extend to roads, water supply, sewerage, drainage, lighting, health, and generally to maintaining the good rule and government of the municipality. The necessary funds are obtained from rates, which are levied on the basis of the annual value of the land (or, in the case of unimproved land, on 5 per cent. of the capital value). The rates may not exceed 2s. in the £ of such annual value. Provision is made for the endowment of a municipality from the public funds during the first fifteen years of its existence.

This system, however, has proved inadequate. Experience has shown that, so long as local government remained a purely voluntary matter, municipalities were confined to the



JUNCTION DAM BELUBULA RIVER.

more thickly populated parts of the State ; and at the end of 1905, out of a total of 310,700 square miles, less than 3,000 had been brought within the scope of local government ; so that, as a natural consequence, heavy expense was cast on the central government for the maintenance throughout the State of purely local services.

The desirability of extending the scope of local government had naturally long afforded matter for political discussion, and in 1905 a Bill, framed to effect this extension, was introduced by the Carruthers Ministry, and passed into law in December of that year. In accordance with the provisions of this Act—the “ Local Government (Shires) Act, 1905 ”—the whole State, excluding the more thinly populated Western Division and existing municipalities, has been divided into 134 shires, each of which has been subdivided into three ridings ; and five temporary councillors have been appointed by the Governor to each shire,



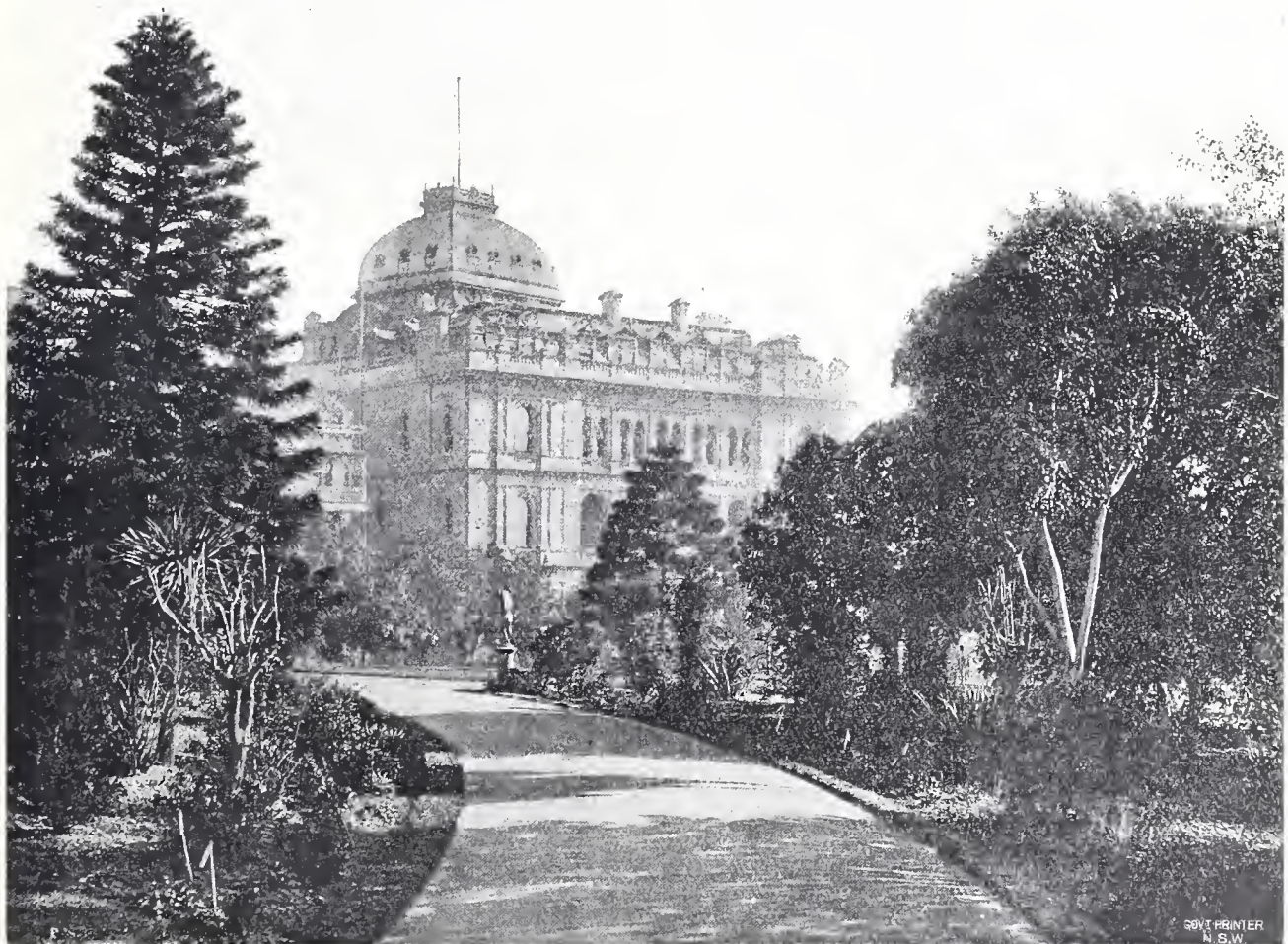
ABORIGINALS—A GROUP IN THE FAR WEST.

for the purpose of making all necessary arrangements for the election of the first council. This will take place towards the end of 1906, and thereafter each shire will be governed by six councillors elected by adult owners and occupiers (male or female) of ratable property of the yearly value of £5 and upwards in the different ridings, equal representation in the council being accorded to each riding. Each council will be presided over by a president elected annually by its members. The number of councillors in any shire may, by resolution

of the council, be increased to nine. The first elected council will retire in January, 1908, and each succeeding council will endure for a term of two years. It is provided that if any shire fail to elect a council, or if the council when elected refrain from exercising its functions, the Governor may appoint an administrator (whose salary will be a charge on the shire's general fund) to exercise the powers of the council. Rates are to be levied by the council on the unimproved capital value of the land, and may not be more than 2d. in the £ nor less than 1d., although the Governor may, at his discretion, allow a reduction below this minimum rate on representation by the council that a smaller rate is sufficient. Land on which a rate has thus been imposed ceases to be liable for the payment of land tax ; and income derived from the rent of the land, and from its use or cultivation, is exempt from income tax. Provision is made for the endowment of the shires from the State revenue to the extent of at least £150,000 per annum, this endowment being appropriated to the different shires according to their needs, for which purpose they will be graded in six different classes. On a shire being constituted, certain powers and duties attach to its council. These comprise,

amongst others, the control and maintenance of public places, regulation of traffic, lighting, prevention of bush fires, and construction and maintenance of streets and wharfs. A council may also acquire other powers, including removal of refuse, provision of water supply, drainage and sewerage, and licensing of hawkers and public vehicles. Provision is made whereby any park, road, bridge, or public work may be declared by the Governor to be a "national work," in which case its maintenance and administration are controlled by the central government. A shire, or any part of it, may be constituted a municipality by the Governor.

Legislation has, moreover, been introduced into Parliament for the purpose of assimilating the existing municipalities to the scheme provided in the "Local Government (Shires) Act." One important alteration in the present system is intended in the matter of rates, which it is proposed should be levied, as in the case of shires, on the basis of the unimproved capital value.



THE CHIEF SECRETARY'S OFFICE, SYDNEY.

PUBLIC FINANCE.

The Commonwealth.

A system of public finance exists for the Commonwealth as well as for each of its constituent States.

The Commonwealth revenue is derived mainly from Customs and Excise duties, and from the Postal Service. The total revenue for the financial year ended 30th June, 1905, amounted to £11,460,315, of which £8,799,530 represents Customs and Excise collections, and £2,630,904 gross revenue from the operations of the Post Office. Nearly the whole of the postal revenue is, of course, absorbed by the cost of maintenance.

The total expenditure of the Commonwealth during the same period amounted to £4,318,435, the chief items of which were—Maintenance of postal service, £2,560,755; and Defence, £706,279.

In accordance with the provisions of the Constitution, for the present all revenue collected by the Commonwealth within any State must be credited to that State. The State is then debited with the expenditure on any of the public departments therein which have been transferred to the control of the Commonwealth, and also with the State's proportion (on a population basis) in the other expenditure of the Commonwealth.* The balance is paid to the States month by month. It is provided in the Constitution that at least three-fourths of the customs and excise duties collected must be returned to the States.† The total amount repaid to the



WHEAT ARRIVING AT A COUNTRY RAILWAY STATION.

States by the Commonwealth in this way during the year ended 30th June, 1905, was £7,141,668, of which New South Wales received £2,529,070, the total Commonwealth revenue collected within this State having amounted to £4,020,727.

* This system of credits and debits is subject to revision after the termination of the "book-keeping" period on 8th October, 1906.

† This provision may be modified by ordinary process of federal legislation after 1910.

New South Wales. The total revenue of New South Wales for the financial year ended 30th June, 1905, was £11,336,918, and the expenditure £11,195,075, the surplus of revenue over expenditure being £141,843, for the year.

Of the gross revenue, the chief items were :—£4,527,368 received from the railways and tramways ; £2,529,070 surplus refunded by the Commonwealth ; £1,757,902



Obverse.



Reverse.

SEAL OF NEW SOUTH WALES (ABOUT 1820).

proceeds of sale and occupation of public lands ; £1,114,408 direct taxation (including land and income taxes) ; £534,753 from the water and sewerage service.

The heaviest items of expenditure were—Interest and redemptions of public debt, £3,176,285 ; maintenance of railways and tramways, £2,911,702 ; education, £839,520 ; public works, £689,397 ; charitable aid (including old-age pensions), £965,977 ; law and crime, £769,213 ; land administration, £307,309 ; water supply and sewerage services, £151,525.

Although direct taxation in the form of land and income taxes is levied, the exemptions allowed in both cases are such that neither tax can be regarded as burdensome ; while the former is now in process of being displaced by the rates levied under the local government extension scheme. The tax payable per annum by owners of land amounts to 1d. in the £ of the unimproved value of the land ; but any person, the whole of whose land does not exceed £240 in value is exempt from the tax, the 1d. being charged only on each £ of unimproved value in excess of £240. A general exemption from land tax will extend to all parts of the State which are brought within scope of the Local Government Act. The income tax is 6d. in the £ ; but here again any person whose income does not exceed £200 per annum is exempt, the tax being charged only on that portion of any income which is in excess of £200 per annum. Further, no income tax is charged on income derived from land which is subject either to land tax or to shire rates.

The public debt of New South Wales amounted, on 30th June, 1905, to £82,321,998. Although the amount is considerable, it must be recollected that practically the whole of it has been expended for the development of the State's resources, and £71,121,721, or more than 86 per cent. of the total debt, has been laid out on works that are directly revenue-producing. As a set-off to the public debt, the State's assets, derived from the expenditure of loan moneys, include the whole of the railway system, of which 3,281 miles are now open to traffic, representing an outlay of £44,274,627 ; tramways representing £4,130,841 ; water supply and sewerage works and water conservation works, £11,487,215 ; harbours and rivers works (including resumptions), £10,661,447. £567,591 has been utilised in making advances to settlers in need of financial assistance, and the net return received from these advances last year amounted to £11,907. The clear revenue derived from these directly reproductive services, after paying all expenses, amounted during the financial year ended 30th June, 1905, to £2,129,405, the interest payable on the whole public debt for the same period being £2,937,149. Moreover, a very large proportion of that part of the loan moneys which has been laid out on services not directly revenue-producing has also been expended for the purpose of developing the State's resources. £1,294,887 has been spent on telegraphs and telephones, now managed by the Commonwealth ; £4,911,698 on public buildings, works, &c. ; £1,713,009 on the construction of roads and bridges ; £194,430 for the encouragement of immigration : and £1,421,976 on military works (now controlled by the Commonwealth).

The Federal Constitution provides that the Commonwealth may take over such of the public debt of the States as existed at the establishment of the Commonwealth, or any portion thereof, according to the respective numbers of their people. When this is done, the interest payable will be deducted from the surplus revenue now returned to the States by the Commonwealth, or if the surplus be not sufficient for the purpose, or if there should be no surplus, the States must pay what is wanting. No part of the State debts has, however, yet been taken over by the Commonwealth. The borrowing powers of the States are not limited by this provision, and the Commonwealth has no authority to take over State debts incurred since the beginning of 1901.



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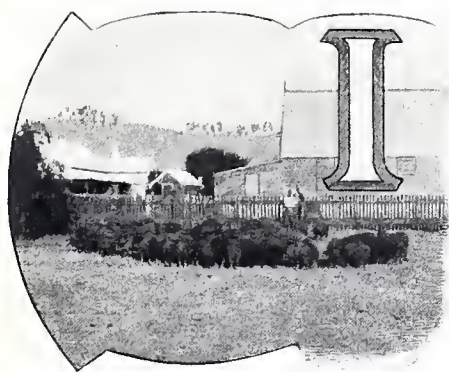
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CHAPTER V.

History of Land Settlement.

Legislative Object—The Rural Population—Attraction of the Cities—Some big Estates—Our National Development.



IN 1861 was passed a Land Act, always known by the name of its author—Sir John Robertson—which enabled settlers to take possession of areas selected before survey, and to start work immediately after selection.

The experience of the past forty-four years has failed to realise many of the great advantages predicted in the exciting days of the “selection-before-survey” struggle of 1860-61. Some districts have been retarded by the indiscriminate methods sanctioned by that Act.

The wrong men got land in good places ; the right men got it in bad places ; settlement was too much scattered ; and the difficulties of pioneering life unnecessarily aggravated. On the other hand, many were encouraged to select land for agriculture, entered upon its possession as *bonâ fide* settlers, and have generally improved their position in every material direction until they have in many cases become independent freeholders, enjoying most of the comforts and simple luxuries of older countries, forming the sinews of this young land, and supplying its greatest source of strength in peace and war.

Although undoubtedly the object of all land legislation in this State has been to settle an industrious population on the soil, and to attain this end many changes have been made from time to time, the results must have been disappointing to the men who used to look forward to the creation of a great Australian yeomanry. In 1861 the rural population consisted of 189,116 persons out of a total of 348,950, equal to 54·2 per cent. ; forty years afterwards the rural population numbered 422,447 out of a total of 1,346,720, or 31·4 per cent. This would seem to imply the very antithesis of successful land settlement. During the same period the area of land absolutely parted with by the Crown rose from 7,146,579 acres to 49,623,081, which means that in 1861 the amount of alienated land was 37·8 acres for each head of the rural population, while in 1901 it amounted to 117·5 acres, so that instead of increasing the number of persons on the soil, we have merely trebled the average amount of land held by each of them.

**The
Legislative
Object.**

The Act of 1884 was passed to limit the amount of land saleable by auction in any year to 200,000 acres, and other suitable restrictions were placed upon land sales, but yet we find that though the area disposed of in 1881, when compared with the total population, was greater than at the present time, compared with the rural population the area was appreciably less.

About 1876 the urban population became equal to that living in the country districts, and from thence onwards grew far more rapidly than the rural, so that at the last census it was found that the urban population exceeded the rural by about 120 per cent. The population of Sydney and suburbs had risen from 27·4 per cent. in 1861 and 1871, to 30·1 per cent. in 1881, 34·3 per cent. in the next decade, and 35·8 per cent. during the next ten years, standing at 35·5 per cent. at the present time. The urban population (including Newcastle, and 221 other towns having a population of over 500) stood at 18·4 per cent. in 1861, and steadily rose to 19·4 per cent.,



LOAD OF WOOL, BULLOCK TEAM.

27 per cent., 31 per cent., 32·8 per cent., during the next four decades respectively, standing at 33 per cent. to-day. The rural population outside of these cities and towns stood at 54·2 per cent. in 1861, then gradually decreased to 53·2 per cent., 42·9 per cent., 34·7 per cent., 31·4 per cent., during the next four decades respectively, standing at 31·5 per cent. to-day.

In explanation of these figures, however, it must be borne in mind that forty years ago a large number of women and girls—the farmers' wives and daughters—were actively engaged in dairy work, but owing to the operations of the separator, the factories, and the creameries, the same class of women are not now included among rural workers. But an undoubted cause of the decrease in rural workers is the aggregation of large estates, frequently by the absorption of a number of the smaller holdings of selectors, whereby an economy of labour—most undesirable from the national point of view—has been effected.

The best energies of our statesmen are now being directed to the rectifying of this evil, and to the subdivision of these huge estates, and the settlement of large numbers of families by a more intense system of cultivation.

No characteristic of modern industrial life has been productive of more speculation as to its probable effect on the progress of humanity than this concentration of population into large cities. In the older countries of the world there has been a steady influx of population from the rural districts, and statesmen and economists have been much concerned lest the movement should end in the decay and possible extinction of the healthful rural class to which our virile race has owed so much in the past. We can understand this state of affairs in Great Britain, where the manufacturing industries have changed the character of the occupations of the people, and have consequently attracted to the towns from the country the young people, drawn by the hope of more remunerative employment and the allurements of social life.

**The
Attraction of
the Cities.**

In the United States the same condition of things is found to a greater or less extent, but there the rise of the enormous manufacturing cities has also been accompanied by a corresponding increase in the rural population. The figures supplied by the Statistician's Department show that in England only 4·6 per cent. of the total population are engaged in rural industries, in Scotland 6·9 per cent., in Ireland 19·6 per cent., in France 44·7 per cent., in Germany 32 per cent., in Italy 29·6 per cent., in Denmark 38·7 per cent., in Holland 45 per cent., in Sweden 46·2 per cent., in Switzerland 37·9 per cent., and in New South Wales 8·7 per cent. While one can understand why such cities as London, Paris, and New York must attract large numbers of people on account of their immense commercial importance and attractiveness as centres of art, literature, and national life, it is hard to see why Sydney should have been such a powerful magnet in drawing and retaining such a large percentage of the immigrants from Great Britain and other countries, besides many from our own rural districts. Of every thousand persons added to the population during the last census period 267 were drawn from other towns and rural districts of this State, and 733 came from abroad, or were attributable to natural increase.

Probably the geographical position of Sydney is accountable for much of it, for it is found that immigrants to Australia linger long in their port of debarkation, and they seldom care to leave it while employment is procurable. It must be admitted that rural life in Australia in the early days offered few social attractions to the successful settler, who often turned, as soon as he had amassed a competence, to the metropolis for the comforts which the country was unable to



furnish. Every year is equalising things better, rural life becoming more attractive, and the stress and strain of strenuous city life more nerve-racking and more distasteful to many. But above all the other attractions, the abnormal loan expenditure of the financial years between June, 1901, and June, 1903, totalling £9,417,972, had the effect of providing employ-



ment in a succession of large enterprises carried out at the expense of the State, and paid for out of these external loans, which not only provided employment for our own people, but attracted to New South Wales a large number of persons, who, having no instinct towards farming, quitted the rural districts on the completion of the public works which gave them employment, and flocked into the towns, generally into the metropolis, there to swell the large class of unskilled labour.

Wool-growing, which has been for many years our staple industry, has not been conducive to the employment of large numbers of rural labourers, for the actual tending of the flocks needs few hands, and these widely scattered; while the handling of the bales of wool at the ports of shipment—Sydney and Newcastle—and on the railways, demands the assistance of a large number of unskilled city labourers. In point of fact, during the past ten years, the number of persons actually employed in pastoral pursuits has decreased by 7,000, and now shows the small total of 27,886 persons, or 1·9 per cent. of the total population, as against 100,244 actually engaged in agriculture and dairying, being 6·8 per cent. of the whole population. In connection with these figures it must be noted that the pastoral industry is by far the most important item in our national wealth, yielding last year £16,500,000, while agriculture and dairying produced £10,000,000 and mining £7,000,000. The progress of rural settlement with us shows very uneven distribution, closely settled patches alternating with wide tracts very thinly peopled. This has been due to a variety of causes, such as the natural advantages of certain districts, propinquity to markets, and above all, probably, the effects of our land legislation, and its methods of administration. The one factor which has done more than any other during the past twenty years to encourage land settlement, and increase the area of agriculture as distinguished from grazing, has been the extension of our railway system throughout the length and breadth of the State. With the commencement of their construction the era of sound progress set in, and with a still further extension of our railway system in right directions there will be a greater stimulus to the unlocking of large estates and settlement for agricultural purposes than can be attained by any artificial legislation.

Some Big Estates.

To show how our national estate has been alienated, and has aggregated into a number of large areas in comparatively few hands, the following figures may be quoted :—Holdings of 1 to 30 acres number altogether 24,640, and they absorb 190,921 acres ; holdings from 31 to 400 acres amount to 35,787, and the total of these is 5,347,019 acres ; holdings of 401 to 1,000 acres number 91,011, and their aggregate area is 5,718,931 acres ; holdings of 1,001 to 10,000 acres number 5,512, which aggregate 13,994,182 acres ; holdings of 10,001 acres and upwards number 722, and their aggregate acreage is 22,830,261, of which 41 are in the Western Division, embracing 1,066,956 acres, under conditions where large holdings are absolutely necessary under present circumstances. These figures indicate a development of affairs that will not much longer serve the general interests of our State, 722 persons or financial institutions holding nearly one-half, 6,234 holding more than three-quarters of all the land already alienated by the Crown.



IN A WESTERN WHEAT-FIELD.

The vast area of many of these holdings, occupied mainly as they are for purely grazing purposes, undoubtedly tends to check rural development. Included within what has been termed the wheat belt, which is stated by competent authorities to be suited for the cultivation of wheat owing to its quality of soil, rainfall, and other climatic conditions, there is an area



THRESHING ON A WHEAT-FARM IN RIVERINA.

which may be moderately computed at 20,000,000 acres (some authorities say 25,000,000), which ought to be growing wheat for the support of the human race. When we reflect that of the 49,623,081 acres alienated the total area under crop at present amounts to only 2,672,973 acres (less than 5·5 per cent.), we can realise what a vast population this area of 20,000,000 acres of wheat land used for pastoral purposes could be made to support, if it were devoted to its proper use—say, a million souls on the farms, who would in their turn give work and sustenance to three times as many in cities, towns, and villages. Of the total area held in blocks of 1 to 30 acres, over 26 per cent. is cultivated, of the holdings of 31 to 400 acres, 14·49 per cent. is under cultivation, and of the area held in blocks of 1,001 to 10,000 acres, 5·13 per cent. is cropped; while of the enormous area held by the 722 persons, syndicates, and financial institutions who have nearly 23,000,000 acres, only 300,159 acres, or 1·3 per cent., are under crop, which makes one pray that the ominous words of Goldsmith may never be applicable to this highly favoured young country:

“Ill fares the land to hastening ills a prey
Where wealth accumulates while men decay.”

No wonder that our population is sparse, being less than five persons per square mile, while Belgium has 613, England 577, Holland 431, Italy, 297, Germany 269, Switzerland 209, Japan 319, China 265, and India 166. If we contrast the relative productiveness of grazing land and agricultural land, we shall find that the return from agriculture was last year £2 0s. 6d. per acre; from grazing less than 4s. per acre on all land alienated from the Crown, and less than 1s. per acre if we include the whole of the land held by pastoralists by way of leases as well as conditional purchase.

**Farming on
Shares.**

Among the factors that are tending to brighten the prospects of the State with regard to closer settlement we may rank high the new system of farming on "shares," now practised with conspicuous success by a number of large landholders in the Corowa, Wagga, Young, Grenfell, Parkes, Tamworth, and Narromine Districts. The idea will appeal, strongly, we think, to the class of men whom we want to induce to come to us from the old country—men of good practical experience in agriculture, with a little capital and abundance of grit and perseverance. Mr. J. Q. Wood of Brundah testifies that his tenants on this system and he himself are equally satisfied. He intimates that the net returns to the landowner, under this system, are twice to three times as great; that an estate which would return £2,000 per annum from wool alone, would, if suitable for wheat-farming, return on an average £10,000 from wheat, and that at least twenty families would be thereby settled on the soil. Messrs. Mack and Austin of Narromine give the results of two men working a farm of 303 acres on this system:—

	£	s.	d.
1903 season—a good one—5,339 bushels, realising	...	...	...
1904 season—a very bad one—1,144 bushels, realising	...	...	...
Estimated cost for two years of putting in and taking off crops (including labour)	360	0	0

As at present practised it is in many cases a kind of nomadic farming. The man and his family come at the right time with the horses and implements; they camp on the ground and get in the crop; depart to their permanent home or other work till the crop is ready, when they return and harvest it, bag it, stack it, and, perhaps, earn extra money by carting it to the nearest railway. But from this beginning will gradually evolve a system under which the owner will cut up his estate into farms, fence them, and erect the necessary buildings, as desirable tenants come along, and then pursue a system of mixed farming, with a greater variety of crops and the use of approved means of conserving the fertility of the soil. This system will admirably suit immigrants who have little capital besides their skill and industry, and who will be able, while getting their colonial experience, to profit by the experience of old settlers.

Value of Produce. Unfortunately the tendency of the total value of produce per acre has rather been downwards during the past twenty years owing to depreciation of wheat, for it was £6 2s. 4d. in 1880, £5 0s. 11d. in 1883, £3 19s. 3d. in 1893, only £1 16s. 10d. in 1903 after the terrible drought of 1902, and £3 5s. 9d.

in 1904. What a picture these figures convey!

But the grand total shows an encouraging increase, since the total area under cultivation has steadily grown from 710,337 acres in 1881 to 2,672,973 acres at the present time, and the average area of cultivation per inhabitant has increased from .9 acres to 2.2. The output of wool has increased in value from £5,765,761 in 1878 to £9,274,387 for the last year for which statistics are available, though it must be noted



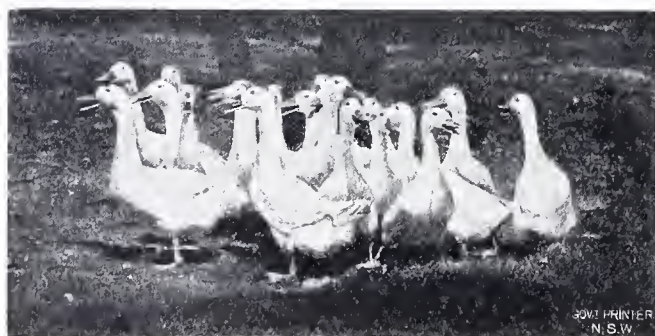
that there have been great fluctuations in price in the meanwhile, since we had £10,643,089 in 1889, over £11,000,000 in 1891, and over £10,000,000 again in 1892 and 1899.

The totals from wool, and from all classes of agricultural produce for last year were almost equal, although the area under crops was only one-fourteenth of that held by graziers under conditional purchase, and one-fifty-ninth of the total held under purchase and by lease. Another encouraging sign is the increase in the value of our dairying output, the export of butter for 1904 having amounted to 20,513,307 lb., and for 1905 about the same, almost three times as much as the output for the year 1903. There has been a satisfactory increase in all classes of stock during the past year, but the totals are still far behind the records of 1895 and 1896, except in the one case of pigs.

When we compare the value of the total agricultural produce of our State per head of population with that of other countries, we find that, agriculturally speaking, we are not by any means at the bottom of the list. Little Denmark stands highest with £8 6s. per head, United States, £7 7s., France £7 3s., Canada £6 9s., Argentine Republic £6, while we come next with £5 9s., Austria following with £5 7s., Spain £5 5s., Germany £5 1s., Belgium and Italy £4 6s., Holland £4, Switzerland, £3, and the United Kingdom £3 2s.

And we notice that in the acreage under cultivation per head of population we occupy a somewhat similar relative position. The United States comes highest with 10·9 acres, Canada 5·6, Argentine Republic 4·4, Denmark 2·9, France, Spain, Switzerland, and ourselves 2·2, Russia and Austria 1·7, Italy 1·6, Germany 1·2, 1·1, Holland 1, per head. To proportion of our we have only to dealing with the total area devoted agriculture and to

We find that cent. of the total production; in Italy, 70·6 per cent.; in France, 68·9 per cent.; in England and Wales, 67·6 per cent.; Spain, 59·9 per cent.; Belgium, 59 per cent.; in Germany, 48·8 per cent.; rocky Switzerland, 35·1 per cent.; Scotland (land of mountain, lake, and heather), 25·2 per cent.; Canada, 23·6 per cent.; Ireland, 22·9 per cent.; Norway, 3 per cent.; and New South Wales, 1·5 per cent. to crops, while 64·3 per cent. is devoted to grazing. In the average area of holdings the United States stands highest with 146·2 acres, and New South Wales comes second with 70·9 acres, England 65·3, Scotland 61·5, Spain 61, Denmark 41·5, Germany 19·2, Belgium 5·2, where no fewer than 88 per cent. of the holdings do not exceed 5 acres; Denmark coming next with 47 per cent., Germany, 45 per cent.



United Kingdom Belgium 6 acres show what a small land we are utilising look at the figures proportion of the respectively to grazing.

in Denmark 73 per area is given over to

The history of our first century of existence is a record of steady, not brilliant, progress, of many vicissitudes and trials, of progress alternating with stagnation, of hope succeeded by blank despair, failure of some and brilliant success of others—all largely affected by our cycles of recurring droughts and floods, by visitations of blights and vermin, but above all aggravated by mistakes in Government, weak or ignorant administration, absence of technical knowledge, want of thrift, an inadequate and stereotyped system of education, alike for city and country, failure to give assistance at the critical moment, and a want of uniformity in land legislation having especial regard to agricultural settlement.



SUMMER-HILL CREEK, OPHIR; THE SITE OF THE FIRST DISCOVERY OF PAYABLE GOLD IN AUSTRALIA.

A century ago, the infant colony was practically bounded on the north by the Hawkesbury River, on the west by the Blue Mountains, and on the south by the Shoalhaven River, and many colonists thought that there was little room for expansion. The construction of the road over the Mountains in 1815, opened up new country of great promise, discovered pasturage for millions of sheep, and presented vistas of still greater territory to be explored. In 1850, many felt that the limits of habitable country had been reached, and that nothing but arid desert lay all around.

The discovery of gold in 1851 sent adventurous spirits further afield and revealed new potentialities of agricultural and pastoral wealth, which have been of more enduring value than the richest of our goldfields. Thirty years ago dairy farmers were despondent, fearing that their industry had reached its zenith and that the available markets were overstocked. Butter coming from the South Coast, by little steamers, in summer time often realised not more than 4½d. per pound, and it was really worth no more, being merely an inferior grade of cart grease. The separator and the factory, with the refrigerating chamber on the steamer, have changed all that, and to-day we can compete on equal terms with Denmark, France, and Russia, in the almost illimitable market of Great Britain.

To the man who may feel any doubt as to the possibility of getting land
Farmers of the suitable for agricultural purposes on reasonable terms, we would point out
Right Type. that public opinion and the trend of legislation both point to the subdivision of large estates in the near future, and whether these estates are secured by the Government and subdivided by them, or are offered by their present owners, we know that the terms will be reasonable and that the prices will be fixed by public competition.



A TYPICAL DAIRY-FARM ON THE NORTH COAST.

The past fifty years have proved what an enormous range of products can be successfully grown in this State, and increase of population will gradually make more and more of these financially profitable. It can produce everything necessary for man's sustenance and comfort, from tobacco down to



IRRIGATED LUCERNE AT BATHURST.

barley; all his beverages, from champagne down to coffee and tea; nearly all the fruits that can be grown, from mangoes and bananas to strawberries; and all the luxuries that appeal to old and young, from ostrich feathers down to castor oil. How can there be any anxiety about the overproduction of fruit, when we know that this State alone imports at the present time more canned fruit and preserves than could be grown on an additional 5,000 acres of orchards, while other States are at present still less able to supply their own necessities.

We have many successful bee-farmers, and yet we import honey and wax every year. We have 330,000 pigs, and are still importing bacon and hams. Not only can we extend the area of our dairying operations, but we can greatly increase the intensiveness. We now have 425,000 dairy cows, whose average yield is 373 gallons per annum, which can be certainly increased to nearly 600 gallons with more knowledge, more skill, and greater care.

In short, there is plenty of room on the soil for more farmers of the right type, and plenty of room at the top of that valued class of producers for superior men, who understand the problems of their calling and who can increase the productiveness alike of their soil and of their stock.

Our National Development. The actual evolutionary stages of our national development have now reached a point at which we can safely extend the area of our agriculture and mixed farming, without in the slightest degree imperilling or diminishing the value of our great pastoral industry. The generous provision of railways, much in advance of present requirements, to districts once deemed unsuitable even for pastoral pursuits, has done much to pave the way for intenser cultivation. The

discovery and tapping of the great basin of artesian water have given stability to the pastoral industry in districts in the dry west, where periodical droughts have hitherto made it a risky investment, and they will in due course supply considerable areas of cultivation, which will give further confidence to the grazier, and at the same time increase the comforts of living for the western settlers.

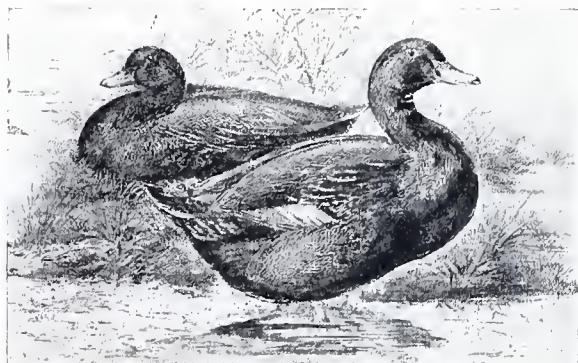
The possibilities of irrigation have been proved to the minds of the governing powers, and within a short time vast areas will be devoted to orchards, vineyards, and mixed farming, which now merely support one sheep to the acre.

**Great
Educational
Work.**

Much educational work has been done by the experimental labours of pioneers in different directions, by the progressive agricultural papers which are available at small charge to the farming class, and by the useful educational work done by the Department of Agriculture, through its district experiment farms and the investigations of its scientific staff. The introduction of new crops and grasses, the improvement of varieties of seed (more especially wheat), the introduction of new blood in all classes of stock, mainly by private enterprise, and the publication by the Government and by the daily press of the results of experiments in different parts, and the good educational work being done by many agencies, all have paved the way for a more effective occupation of the vast areas of agricultural land, which have hitherto been used only for grazing.

Above all, there has been a practical tone given to our national system of education by the establishment of an Agricultural College, and agricultural schools in different climatic districts of the State, and a technical flavour given to the general system pursued in the primary schools of the State, which must have a far-reaching effect in moulding the destinies of the rising generation.

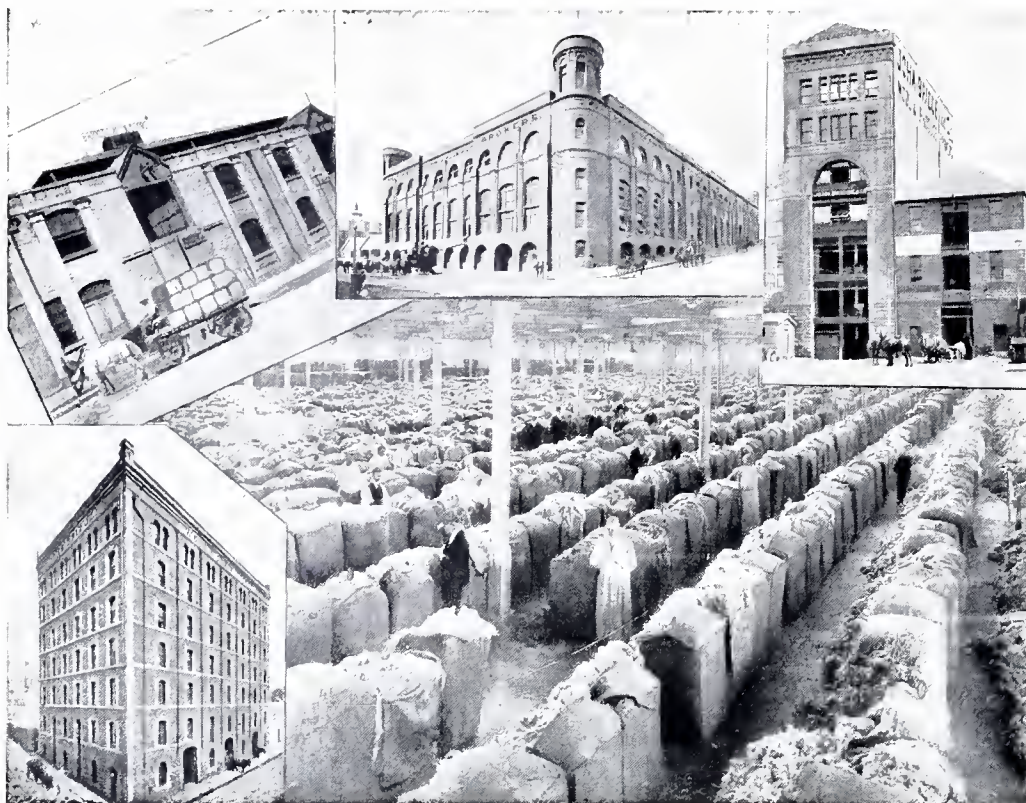
We are now going through the different stages in our evolution which the United States passed through a century ago, and there can be no doubt that our progress during the next half century will be as great, as remarkable, and as enduring as that which historians of that great territory have now placed on record. We have the soil, the agricultural potentialities, the mineral wealth, the favourable climatic conditions, and everything that is needed to build up a great and powerful nation, and we are now in a position to invite men and women from all parts of the British Empire, Europe, and the United States to come and help us in our nation-building.



ROUEN DUCK.



TYPICAL SCENE IN A DAIRYING DISTRICT.



The Wool Warehouses and Wool Show Floor of John Bridge & Co., Ltd.

WOOL-GROWING—Australia's Main Industry,
 CAN BE MADE **MUCH MORE PROFITABLE** to the **DIRECT OWNER**
 BY HIS **SELLING THE WOOL CLIP THROUGH A FIRM**
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THOROUGHLY EXPERIENCED, ENERGETIC, AND
UP-TO-DATE IN ALL WOOL MATTERS.

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IS THAT FIRM. **PYRMONT, DARLING HARBOUR, & CIRCULAR QUAY.**

Wool-selling
since
1869.

The Wool-growers Unmistakable Verdict
for the 3 Past Seasons in favour of
ENERGY and SUCCESSFUL SALES.

SEASON 1903-4	SEASON 1904-5.	SEASON 1905-6.
42,293 BALES SOLD	55,767 BALES SOLD	68,391 BALES SOLD

Acquisition of Land.

Opportunities afforded by the State—Crown Lands Tenure—Method of Acquiring—Resumptions for Closer Settlement—Suitable Private Subdivisions.

By EDWARD J. SIEVERS,

THE GOVERNMENT VALUATOR.



FACILITY for exchange of commodities is necessarily a governing factor in the prosperity of any community, and accessibility to the world's markets has long been an admitted necessity for the success of the producer. Had the controllers of our destiny in the middle of the last century conceived it possible that the mercantile marine of the world would have grown from 500-ton clipper ships to the mammoth ocean tramps of to-day, rendering the despatch of a box

of butter, or a frozen sheep, from an up-country farm in New South Wales and delivery in Leadenhall Markets, London, a payable venture, involving only five or six weeks' transit, it is quite possible that the administration of our Crown lands would have followed different lines.

The "spoils to the victor" principle has long obtained in all matters affecting the acquirement of real estate in even larger concerns than the Department of Public Lands in New South Wales, and ill would it become us in these later days to begrudge the fruits of their labours to the pioneers of this State; at the same time, with a different condition of things—new markets, a change to an extent of climatic conditions, with a huge State expenditure in opening up formerly practically inaccessible country,—facilities for an increased rural population must be found.

Too liberal treatment in the forties, fifties, and sixties, and quite as late as the eighties, of the national estate, has led to the aggregation of many holdings which to-day's circumstances prove can be much more profitably utilised by "closer settlement"; and the cattle-runs and sheep-walks of the past must be confined to more reasonable limits. Intelligent treatment

and use of the land with modern appliances and proper conservation of water, enable the carrying capacity of runs to be maintained—in fact increased—while admitting of great curtailment in area.

Recognising, then, that the pioneer has secured the cream of the land, and in many cases so “peacocked”* the balance as to render profitable occupation of the Crown land still



VIEW OF TUMUT FROM ONE AND A HALF MILES DISTANT.

unalienated well nigh impossible, the attention of the Legislature has in recent years been directed to making the way of the new-comer and settler as easy as possible. With this end in view, various Acts have been passed, and more are now in contemplation, whereby settlers may secure the balance of the Crown lands available on exceptionally easy terms, and in what are known and aptly described as “living areas.”

* Colloquial term for picking the eyes out of an estate by securing the catchment areas, alluvial flats, &c.

Parliamentary sanction has, too, been given to the purchase or resumption of privately-owned estates, at present devoted to purely pastoral purposes, but which are by nature more suited, under actual conditions, for closer settlement. The authorising Acts provide, of course, in case of resumption, for the payment of full compensation, estimated by a legally constituted tribunal, thereby safeguarding the owners against hardship.

It should, however, be borne in mind by intending settlers that, though now the path to success is not so rugged as that which fell to the lot of the pioneer, at the same time, unless one has sufficient capital to purchase an improved farm, with cleared land ready for the plough, the "taking up" or selection of Crown lands presupposes a deal of solid hard work before the returns begin to come in. While it must be admitted that, as in Canada, United States of America, and the majority of the other Australian States, the greater proportion of the better-class New South Wales Crown lands have been alienated, still there remains open for settlement in various forms a considerable area which may be secured upon conditions tersely described at the end of this chapter.

To some extent, as the natural corollary of the land tax imposed some few years ago (though but 1d. in £ on unimproved values), private owners, too, in all parts of the State, falling into line with the existing conditions, are bringing into the market in subdivision, tracts of agricultural and dairying country in blocks to suit all classes of settlers.

While these lands, being partially and in many cases highly improved, are generally more costly than Crown lands, the terms are liberal, and every assistance is afforded those whose means are not, perhaps, proportionate to their energy and ambitions. (It will be seen by another chapter that there is a system in vogue of advances by the State to settlers.) The price of these subdivisions ranges from £3 to £10 per acre, proved blocks. The estates close to some settled centre through community of interest, butter, bacon, and kindred factories have sprung into existence, thus ensuring a local market for produce. Nowhere on earth can be found land at the same price, with similar climatic conditions, equal fertility of soil, or cheaper access to markets; as in New South Wales; and yet it is sometimes found that applicants express disappointment at not being able to acquire land that only requires to be "tickled by a hoe to smile a harvest." Many private estates have been subdivided on the Northern Rivers within the last three



ON THE ASCENT OF KOSCIUSKO.

or four years, and, as an instance, almost 40,000 acres of Kyogle have been disposed of, aggregating in purchase money some £200,000. Prior to the first subdivision in 1902 the land was used simply for fattening beeves.

When the Northern Rivers land was first taken up, the roads, save main **Crown Lands** roads, were for the most part tracks, and no railway communication existed **to be** to the port. Much pioneering work of a hard nature had to be done before **opened up.** the fruits of the labour were ripe. To-day the Crown is opening up for settlement, between Lismore and Murwillumbah, on the Tweed River, a large tract of good land, but admittedly back from settlement. The new-comer must be prepared to do, as did his now prosperous comrade nearer the townships—wait for the comforts that follow settlement. Fencing, clearing, grubbing must precede the purchase of the buggy and piano. As of the Tweed River lands, so of the Dorrigo scrub, some 100 miles southward. Some of the best farming land in the world is to be shortly placed upon the market, and though removed some little distance from the seaport, presents similar features to that of the older settlements of a few years ago.

On the northern tablelands—round Armidale, Glen Innes, and Inverell—all of which have railway communication with Sydney, and are situated from 80 to 130 miles west of



FLOCK OF SHEEP, KINROSS.

the seaboard as the crow flies, several estates have been recently placed on the market, both by private individuals and the Crown, and the newcomer to the district is recommended to inspect the results achieved already by purchasers at Bannockburn, Myall Creek, Furracabad, and Byron Estates, all of which were either cattle or sheep runs up to within a year or two ago. In the districts on the southern tableland, also, private estates are being subdivided and placed on the market as the demand warrants.



For the purpose of departmental reference, the Crown lands are divided into three territorial divisions, controlled by the same ministerial head, but subject to a distinct system of administration, in regard to their tenure, areas that can be acquired, and conditions of occupancy or purchase. These divisions, from their geographical position, are aptly described and known as the Eastern, Central, and Western Divisions. The three areas aggregate 198,000,000 acres, of which about 62,000,000 comprise the Eastern, 56,000,000 the Central, and 80,000,000 the Western Division.

Roughly speaking, the Eastern comprises the land situated between the Dividing or Coastal Range and the coast, including the tablelands to the westward, extending roughly about 180 miles from the sea. With the exception of lands before referred to as being prepared for settlement on the North Coast, the bulk of the country adapted for profitable working has been alienated, though from time to time timber reserves and commonages in other parts are being placed upon the market.

The Central Division extends generally west from the foothills of the Western tablelands and slopes, from Queensland on the north to the Victorian border, a tract of country about 750 miles long by 200 miles wide. A great portion of the wool and wheat industry is here carried on. The Division is intersected by three trunk lines of railway and many feeders, watered by several rivers, and possesses many varieties of climate. Nearly half the area of the division is within the artesian water bearing district.

The Western Division, comprising the balance of the State, is almost exclusively devoted to sheep and cattle-raising, and though little of the land comparatively is absolutely alienated from the Crown, the rainfall and other conditions preclude settlement except in large holdings, necessitating a considerable outlay of capital. In country having a carrying capacity of, say, 10 acres to the sheep it may be postulated that large flocks must be carried to render the holdings profitable, and large flocks mean large runs. The seasons- too, are very variable, and though fortunes are quickly made in good times, the Western squatter does well to have a substantial sinking fund against the converse of a "rainy day."

CROWN LANDS.

Information concerning the Crown Lands is officially supplied by the Lands Department as follows:—It is estimated that New South Wales contains 198,634,880 acres, and although a large proportion of this land has been alienated from the Crown, a very considerable



area is still available for settlement. The management and control of the alienation to private persons of the land which is still Crown property is the special function of a great State Department—the Department of Lands. The lands open for settlement under the Crown Lands Acts, and to which the attention of intending settlers is specially invited, are situated in the Eastern and Central Divisions. In consequence of climatic and other disadvantages the lands in the Western

Division are dealt with under a special Act of Parliament, which is administered by a Board, known as the “Western Land Board.” Little need be said about the Western Division except that a considerable area, estimated at about 4,250,000 acres, is available; and leaseholds of much larger areas can be acquired there than are obtainable in the other Divisions, and on exceedingly liberal terms.

Eastern Division.

The Eastern Division offers great facilities for dairy and agricultural farming. The climate, during most of the year, is temperate, the rainfall in average seasons is abundant, and, except in certain localities, extremes of either heat or cold are not experienced. This Division is intersected by numerous rivers and water-courses, and still contains magnificent forests of hardwood, and other marketable timber of high commercial value, while an extensive railway system and a large and increasing fleet of coasting steamers and sailing vessels afford ample facilities for the transport of stock and produce to markets in Sydney and elsewhere. The North Coast district contains ideal country for dairy and agricultural farming—the rainfall being usually almost tropical in its regularity—while the soil is for the most part deep, fertile, and admirably suitable for growing maize, oats, barley, sugar-cane, lucerne, and fruits, also root crops and vegetables of every description. In this district a comparatively small area will support a family, and, although climatic and other conditions in the immediate vicinity of the coast are not favourable for wheat-growing, much of that part of the Eastern Division which lies west of the “Dividing Range” is eminently suitable for the growth of that cereal—quite as much so, in fact, as the Central Division, which is usually regarded as the wheat-growing area proper.

The Central Division. The eastern parts of this Division are especially adapted for wheat-growing ; in the middle lands, agriculture is hardly as safe, although largely followed, while the whole district is admirably suited and extensively used for pastoral purposes. Some of the finest samples of wheat and the best classes of wool are produced in this Division. The summer temperature for about three months is high, but otherwise the climate is delightful, and at all times extremely healthy. The diseases to which stock are subject in the moister climates are unknown here. There are several easy methods of acquiring Crown lands, either as freeholds or under leasehold tenures. For a settler seeking to make a home on the land, the holdings known as homestead selections, settlement leases, conditional purchases, and conditional purchase leases are in every way suitable and convenient.



VIEW OF BELLE VALE FROM BOWNING HILL, IN THE YASS DISTRICT.

This is a very convenient tenure for a settler of limited means. Only half a year's rent and one-third of the survey fee need be deposited with the application for such a holding, the balance of the survey fee being payable in instalments. The applicant, male or female, must not be under the age of 16 years. The homestead selector must reside continuously on the land for five years, on the expiration of which a grant will be issued to him. After the issue of the grant he

**Homestead
Selection.**



BUILDING A HAY-STACK.

must continue to reside on the holding for at least seven months in each year. The annual rent for the first six years will be an amount equal to $1\frac{1}{4}$ per cent. of the capital value of the land (*i.e.*, 3d. in the pound), after which the rent will be increased to $2\frac{1}{2}$ per cent. of the capital value. Areas up to 1,280 acres may be held under this tenure, and the Act provides for the appraisalment of the capital value and readjustment of the annual rent every ten years. Should an area granted under this tenure be found to be insufficient for the maintenance of a home, it may, under certain circumstances, be increased. This provision also applies to settlement leases and conditional purchases.

**Settlement
Leases.**

Areas up to 1,280 acres for agricultural purposes, and 10,240 acres for grazing, may be obtained as settlement leases. Such leases have a term of forty years, and provision is made for the reappraisalment of the rent every ten years, since the introduction of the 1903 Act. A settlement lease cannot be granted to a minor. The area leased must be fenced within five years, and the lessee must reside continuously on his holding during the whole term of the lease. After five years residence the lessee may apply for a homestead grant of that part of the holding on which his dwelling-house is situated, but the area so applied for must not exceed 1,280 acres.

**Residential
Conditional
Purchase.**

The intending conditional purchaser must, on application, pay the prescribed deposit, and a survey fee according to the fixed scale. The deposit is 10 per cent. of the price of the land as notified. An applicant must not be less than 16 years of age. At the end of the third year from date of application an instalment of ninepence per acre must be paid if the land is unclassified, and at the rate of ninepence for each pound of the purchase money if it is within a classified area. A similar instalment is due annually until the purchase money, with interest at $2\frac{1}{2}$ per cent. on the outstanding balance due to the Crown, is paid off. The conditional purchaser will also be subject to conditions of fencing his holding within three years, and residing thereon for a period of ten years. He has the privilege of applying for a conditional lease of three times the area of his conditional purchase, and, having acquired such lease, he may at his convenience, and on payment of the necessary deposit, convert the whole or any part of it into a conditional purchase. Further details in connection with this class of holding can be readily gathered from the Crown Lands Acts and Regulations, and from the Departmental pamphlets on the subject.

**Conditional
Purchase
Lease.**

This is a new tenure created by the Crown Lands Amendment Act of 1905. It enables the intending settler, for a small initial outlay by way of deposit, for a moderate rent, and under easy conditions, to obtain a lease for forty years of land convertible at any time during that period into a conditional purchase. An applicant, if a male, must not be under the age of 18 years, or 21 years if a female. No one may apply who already holds any land, other than town or suburban, or land leased from a private individual; and a deposit of half a year's rent, and at least one-fifth of the survey fee, must be lodged with the application. The survey fee is fixed in accordance with the scale prescribed for original conditional purchases, and, if the full survey fee be not paid with the application, the balance must be paid subsequently by annual instalments of not less than a fifth of the full amount.

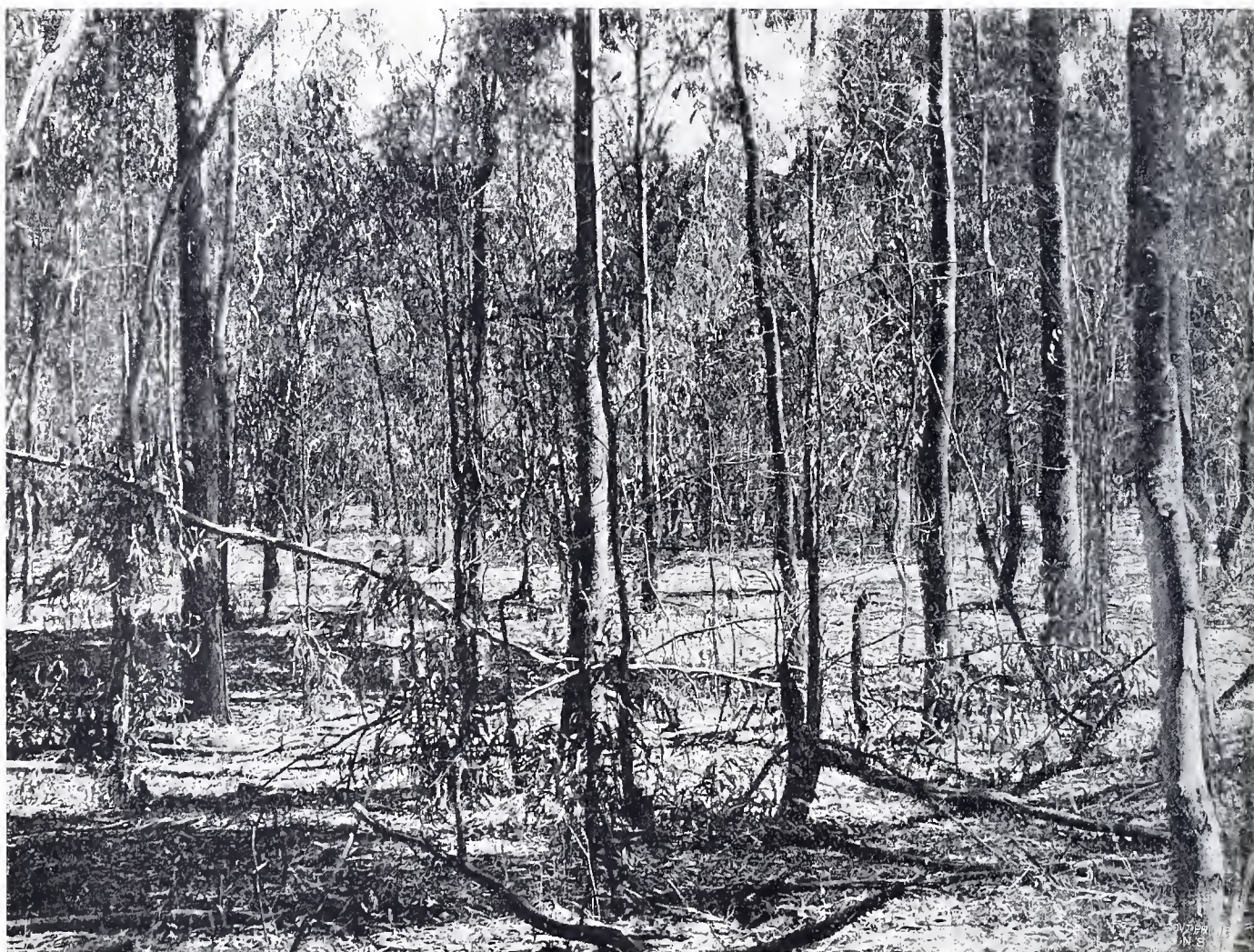
The annual rent for the first ten years is fixed at $2\frac{1}{2}$ per cent. of the capital value of the land, and, should applicant be dissatisfied with the amount, provision is made for reappraisalment of the capital value at intervals of ten years during the term of the lease.

The conditional purchase lessee must within twelve months after confirmation of his application commence to reside on his holding, and must reside thereon continuously for ten years; but, under certain conditions, commencement of residence may be deferred to any date within five years from such confirmation, and, with the permission of the Local Land Board, residence may be performed in any village or town in the immediate vicinity of the holding.



Much attention is being given at present by both Parliament and the Lands Department to the subject of land settlement, and as it is recognised that, in order to meet the growing demand for land, it will be necessary to make resumptions of lands which have already been alienated, an Act, called the "Closer Settlement Act," was recently passed, which gives the Government ample power to resume private lands, and to alienate them on favourable terms to persons who desire to settle and make homes for themselves and their families on the soil.

Only one estate, which is situated in the Inverell district, has so far been acquired and made available for settlement under this Act. The Government is, however, so fully satisfied that a wider application of the provisions of the Act will be for the ultimate advantage, both of the settler and of the State, that other areas will shortly be brought under their operation. An applicant for land under this Act must be at least 18 years of age if a male, and 21 years if a female. The preliminary deposit is 5 per cent. of the notified value of the



MURRAY RED GUM, UNTHINNED.

settlement purchase, and an instalment of a similar amount must be paid annually until the purchase money, with interest at 4 per cent., is paid off. Under this scheme of payment the holding will become freehold in thirty-eight years.

A condition of ten years' residence attaches to every settlement purchase, and residence must be commenced within twelve months from the date of the Land Board's decision allowing the purchase. As in the case of a conditional purchase lease, the date of commencement of residence may be postponed by permission of the Land Board for any period not exceeding five years from the allowance of the purchase, and the residence condition may be fulfilled in any adjacent village or town.

**Method of
Acquisition.**

For convenience of administration, the State is subdivided into many Land Board Districts, in which are appointed various Crown Land Agents from whom forms of application are obtainable, and with whom they must be lodged on certain specified days. These applications are dealt with by local



MURRAY RED GUM, THINNED.

governing bodies, designated Land Boards, who inquire into and report upon the *bonâ fides* of each applicant. The question of capital values is also referred to them for report, which is subsequently submitted for confirmation to the ministerial head of the Lands Department. Owing to the various amendments of the Crown Lands Act, the bare copies of Acts of Parliament would, perhaps, confuse the stranger; but the Department issues pamphlets and plans which explain in simple language the necessary formulæ for taking up available country.

The local Crown Land Agents will be found ready to supply any information sought on the spot, while the Central Inquiry and Information Bureau at the Head Office in

Sydney lays itself out to supply all possible details as to climatic conditions, nature of soil, class of timber, &c., and all other facts which might be of service.



PITTWATER, FROM KURING-GAI CHASE.

While the Government does not undertake the sale of privately-owned estates, the Lands Settlement Branch of the Intelligence Department is collecting particulars of as much available agricultural land as possible, with the view of helping those willing and anxious to go into farming pursuits; and, so far as their opportunities will permit, the particulars forwarded by owners will be corroborated by

departmental officers, so that the conditions anticipated by verbal or written descriptions may be found to be borne out by inspection. Advice can be given as to the suitability of certain districts for certain pursuits, and results obtained by earlier settlers will be explained when available.



STARTING PLOUGHING IN NARROMINE DISTRICT.

CITIZENS' Life Assurance Company, LIMITED.

HEAD OFFICE:

CITIZENS' BUILDING, CASTLEREAGH & MOORE STREETS, SYDNEY, N.S.W.

BRANCHES:

NEW SOUTH WALES: CITIZENS' BUILDING, CASTLEREAGH & MOORE STS., SYDNEY.

VICTORIA: CITIZENS' BUILDING, 281-283, COLLINS-STREET, MELBOURNE.

QUEENSLAND: CITIZENS' BUILDING, 381-383, QUEEN-STREET, BRISBANE.

SOUTH AUSTRALIA: CITIZENS' BUILDING, 131, KING WILLIAM STREET, ADELAIDE.

WEST AUSTRALIA: 241, St. GEORGE'S TERRACE, PERTH.

TASMANIA: LIVERPOOL AND MURRAY STS., HOBART; 66, St. JOHN St., LAUNCESTON.

NEW ZEALAND: LAMBTON QUAY, WELLINGTON.

UNITED KINGDOM: CITIZENS' HOUSE, 24 AND 25, KING WILLIAM STREET, LONDON, E.C.

Assets at 31st December, 1905 - - £1,547,790 9s. 5d.

*Government and Municipal Debentures	...	...	£515,939	16	10	=	33·34	per cent. of Total.
Mortgages, &c.	...	...	601,364	7	6	„	38·86	„ „
Foreclosed Properties	...	...	Nil				—	
Mortgaged Properties in Possession	...	...	Nil				—	
Loans on Policies (within their Surrender Value)	...	...	86,862	10	4	„	5·61	„ „
Freehold Property	...	...	249,063	4	8	„	16·09	„ „
Office Furniture and Fittings	...	...	Nil				—	
Outstanding Premiums on Policies in Force...	...	...	26,829	19	5	„	1·73	„ „
Deferred Instalments of Annual Premiums	...	...	Nil				—	
Interest Outstanding	...	...	Nil				—	
Interest Accrued—not yet due	...	...	12,679	18	1	„	·82	„ „
Agents' Balances	...	...	332	6	4	„	·02	„ „
Sundry Debtors	...	...	2,516	9	6	„	·16	„ „
Cash in Bank	...	...	52,201	16	9	„	3·37	„ „
			£1,547,790	9	5		100·00	

*THE BULLETIN, 22nd February, 1906, said: "The increase in the holding of public securities—which means safety—is notable. No other Australian office of first or second rank has so large a proportion."

**The Company's Consulting Actuary, Mr. R. P. HARDY, F.I.A., F.F.A.,
in his Report on the 1904 Valuation, says:**

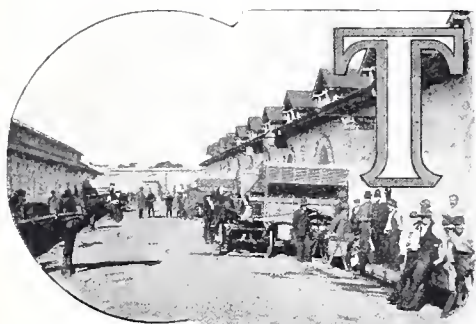
"The Directors are fully entitled to claim that the Security they offer, both to the present Assured and to the Public generally, for the redemption of their contracts is of the highest possible character.

"They should use every means to educate the public to appreciate, not merely the great protection afforded by estimating the Liabilities upon the bases of only a 3 per cent. yield, but further, that such prudential course has the additional advantage of providing a Bonus fund that will grow as the Company grows in age, and will enable compensation to be made to those longer lived whose contributions will have helped to build up the Company."

Advances to Settlers.

By W. H. O'MALLEY WOOD

(CHAIRMAN, ADVANCES TO SETTLERS BOARD).

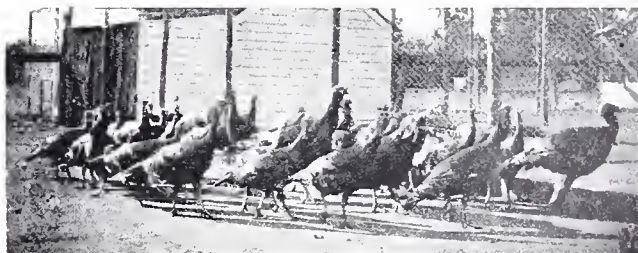


THE granting of loans under the Advances to Settlers Acts is probably the most important of the concessions offered by the State to settlers. These Acts provide for the making of loans repayable by instalments (including principal and interest) extending over a long period of years, the rate of interest charged being the lowest at which the State can lend money without loss.

The original Advances to Settlers Act came into force on the 4th April, 1899. It provided for raising a sum of £500,000 by the sale of inscribed stock, with a view of making temporary advances to settlers who were financially embarrassed owing to drought. The loans were repayable by instalments, including principal and interest, at 4 per centum per annum, the longest term being ten years and the maximum amount that could be advanced to a settler being £200.

By amendments to the principal Act, a wider scope was given to its operations. The amount available for realisation by sale of stock was increased to £1,000,000, and the terms of individual loans were altered to enable advances up to £500 (subsequently amended to £1,500) to be made for any period not exceeding thirty-one years, at a rate of interest which was to be "not less than 4 per centum per annum." The actual rate of interest, however, was fixed by Regulation at 5 per centum per annum with a rebate of $\frac{1}{2}$ per cent. if the instalments were paid within fourteen days of their due date.

The Advances to Settlers Board consists of three members—Messrs. W. H. O'Malley Wood, C. Brandis, and R. W. Hardie,—Mr. Wood being the chairman and supervisor of the staff. Mr. George W. Coeks is the Secretary of the Board. Meetings are held whenever necessary for the conduct of business.



Advances are made upon the security of freehold lands, conditional purchases, with or without associated conditional leases, settlement leases, **Tenures upon** which **Advances** homestead selections and grants, and homestead leases. Forms for application may be obtained at the Office of the Board (Public Works Buildings, Sydney), or from Local Crown Lands Agents. The form should be carefully filled in by the applicant and the Declaration annexed thereto made before a Justice of the Peace. The application should then be forwarded to the Secretary, accompanied by the prescribed deposit to cover the cost of obtaining a report on the security and of dealing with the case.

Intending applicants are advised to lodge their applications well in advance of the date upon which they desire the loan. At the present time the Board have no inspectors on their staff—the necessary valuations being obtained (by the favour of the Department of Lands) through District Surveyors, Inspectors of Conditional Purchases, and other qualified officers of that Department. In consequence of the multifarious duties of such officials, coupled with the extensive travelling to be done, it is only possible to carry out this Board's inspections when they fall in with the officer's regular field duties. It may be explained that if special



BANGALOW PALMS DORRIGO SCRUB.

inspectors were sent to value securities the cost would exceed the moderate fees prescribed by the Regulations. If, however, an applicant desires an immediate inspection, and is prepared to pay the extra cost, the Board endeavour to arrange for a special report. Should the actual cost of inspection exceed the estimated cost, the applicant is required to pay the difference.

The basis upon which advances are made is not fixed by legislation—
Margin of Security. the Act merely stipulates that “security for the repayment of the advance shall be given to the satisfaction of the Board.” In order, however, to avoid disappointment to applicants, and at the same time furnish them with some idea of the amount likely to be advanced upon any security, the following information is supplied :—

On freeholds, advances are made up to two-thirds of the unimproved value of the land, plus half the official value of the improvements, the value of the improvements being the increased sale value they give the security in the open market.



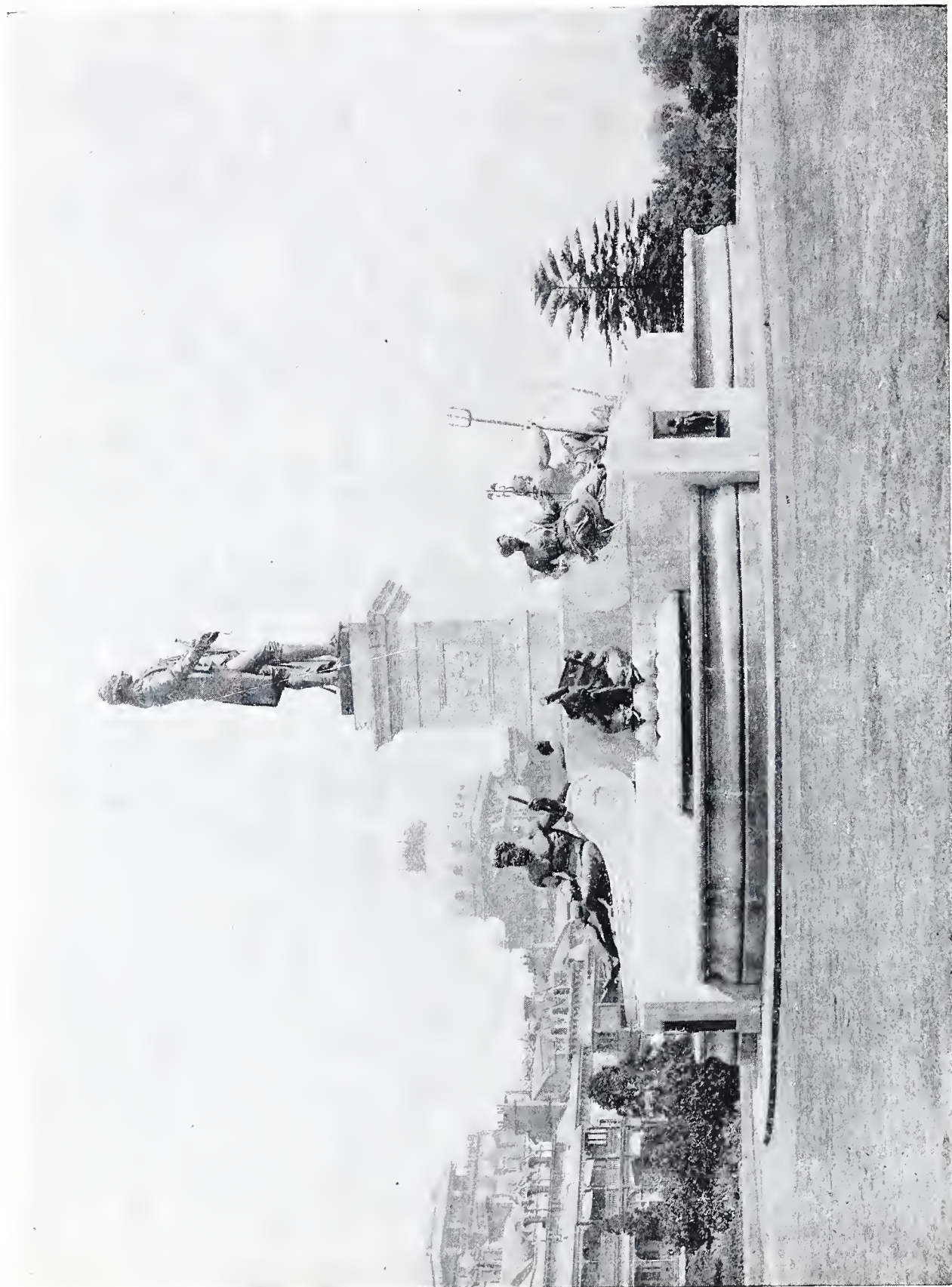
A HARVESTING SCENE.

On conditionally purchased land, an advance would not exceed two-thirds of the holder's paid-up interest in the freehold, plus one-half the official value of the improvements.

On conditionally purchased and conditionally leased lands, an advance
Leased Land. would not exceed two-thirds of the paid-up interest in the freehold of the conditional purchase, plus one-half of the official value of the improvements on the whole security.

On settlement leases, homestead selections, homestead grants, and homestead leases, an advance would not exceed one half the official value of the improvements.

Where the amount proposed to be advanced upon the security of freehold or conditionally purchased land, homestead selections, or homestead grants, exceeds £50, the maximum term of



STATUE OF GOVERNOR PHILLIP BOTANIC GARDENS, SYDNEY.

thirty-one years is allowed for repayment if the applicant so desires. Where the amount is less than £50 the Board usually fixes shorter terms for repayment.

When the security consists wholly or in part of a lease, the period for repayment is influenced by the date of expiration of the lease.

In a case where a loan has been granted for a term less than the maximum **Extension of Period for Repayment.** period, a borrower is entitled to apply to have the period for repayment extended so as to reduce the periodical instalments. The Board usually insist upon payment of accrued interest on the loan and lands claims before granting the extension sought.

As the Advances to Settlers Acts were intended to assist farmers who derive their living from the soil, advances are not made on lands situated within town or suburban boundaries. This latter class of security is regarded as residential rather than as farming land.

Owing to the various kinds of diseases and insect pests to which trees and vines are subject, as also the damage that may result thereto by neglect, the Board find it necessary to exercise the greatest

care in making advances upon orchard properties and vineyards, and accordingly they usually require a larger margin of security than in other cases.

Poultry and pig farms (unless forming part of a dairy or agricultural security) are also properties upon which it is found that only small advances can safely be made; indeed, it is questionable whether these properties should not be altogether left alone.

Although borrowers in the majority of cases meet their instalments satisfactorily, some have shown indifference to their obligations, and have ignored the usual notices and reminders. When it was known that settlers *could not* pay owing to adverse natural conditions, the Board has exercised the greatest clemency; but now that better seasons prevail borrowers are expected to meet their obligations with punctuality, and, in cases where they fail to do so, prompt steps are being taken to call up the loan.



STACK OF NATIVE GRASSES.

Insurable buildings are required to be insured in the name of the Chairman of the Board, payment of the premium being one of the covenants entered into by a borrower

It is also covenanted that borrowers shall punctually pay all claims for rent, &c., due to the Department of Lands, and comply with the conditions imposed by the Crown Lands Acts.

Although advances are granted for a fixed term, and the arrangement, so far as the Crown is concerned, is unalterable, yet the Board, as a matter of grace, allow borrowers (if they so desire) to repay the loan at any time during its currency; but interest must always be paid up to the date upon which the current instalment falls due. The Board usually consents to a transfer of a security provided instalments are paid to date, and the transferee accepts personal liability for the unpaid balance of the loan. In cases where a borrower desires to effect a second mortgage with a private individual, the Board will always produce the title deeds in their possession for registration purposes. Hitherto this has been done without making any charge, but it will be necessary in the near future to frame a schedule of charges for services of this character, as a considerable amount of labour is imposed upon the Board which should, in all fairness, be paid for by the parties concerned.

The amount already raised by sale of stock is £414,450, and this sum has been almost wholly absorbed in making loans to settlers. The amount remaining to be raised under the existing Act is £585,550.

During a recent session of the State Parliament a Bill “to amalgamate the Savings Banks and create a special Department for making advances to settlers” was passed by the Legislative Assembly, but rejected by the Legislative Council. It is understood, however, that a similar measure will be reintroduced.





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ESTABLISHED 1889.

JAMES FAY McDONALD & Co.

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PRIVATE "PREMIER."

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Manufacturers' Orders
Executed with Promptness.

Sole Agents for . . .

"BUTTERCUP CALF MILK"

KING OF CALF FOODS,

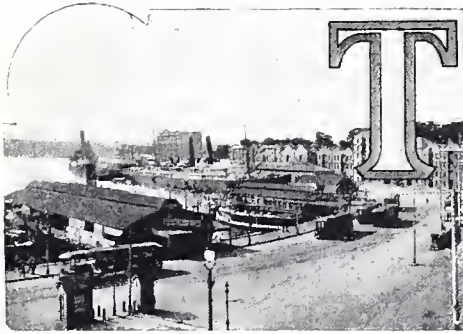
An Absolute Substitute for
MOTHER'S MILK for .
Rearing Calves. . .

CHAPTER VIII.

Markets Available.

Export Trade in Meat and Produce—Average Prices—Probabilities of Demand—Means of Export.

BY H. V. JACKSON.



THE available markets for New South Wales products are practically world-wide. It is but natural, however, that the largest customer should be the motherland—Great Britain—although the volume of trade with other countries is not inconsiderable, and is steadily increasing. The products for which New South Wales requires an outside market are, first, wool, then, among others, wheat, butter, coal, metals of various kinds, leather, skins, and hides, meat, tallow, timber, and wines. The

list could be materially added to, as will be gathered from a perusal of the chapters of this book, by a more comprehensive adaptation of the scientific principles of agriculture, and by the more rapid development of some of our latent resources.

The export of wool to the British market is at present the most important item in our export list. France and Germany are among the largest customers of the State, while Belgium is also a considerable purchaser. Great Britain is also at present, and will probably continue to be, the largest purchaser of frozen meats of all descriptions from New South Wales. It will be seen from the attached statement of trade with oversea countries during 1905 that, apart from the trade done with European nations direct, there is also an increase in our commerce with the countries comprising North and South America, the most important being Canada, the United States, and Chili. A small amount of business is done with Aden in the Red Sea, and there are yet possibilities of considerable business at Port Said, Cairo, and Alexandria.



Cape Colony, Ceylon, Burmah, Gibraltar, and many other outposts of the British Empire, all do more or less trade with this State, and allowing that in this country almost every requisite of the human race can be produced, there is no limit to the possible extent of our trade in all parts of the world in the years to come.

In 1905 New Zealand imported from New South Wales £934,661 worth of goods, and exported to the State goods to the value of £1,369,001. The **Year's Trade.** New South Wales exports to the United Kingdom in the same year were valued at £10,222,422, while the imports from the same country were £8,602,288. The total New South Wales exports to the British Empire for 1905 were £13,731,091, and the imports £11,050,514. In the same period the exports to foreign countries were



FLOCK OF SHEEP AT WALLA WALLA.

£10,762,439, and the imports £3,434,609. The bulk of this foreign trade was done with France, Germany, Belgium, and the United States. Efforts are now being made through the agency of commercial representatives in the East and South Africa to open up markets for our products in those countries.

As showing the exact destination of our trade the following table of imports and exports for 1905, and the countries to and from which the goods were carried, will be found of interest :—

NEW SOUTH WALES.

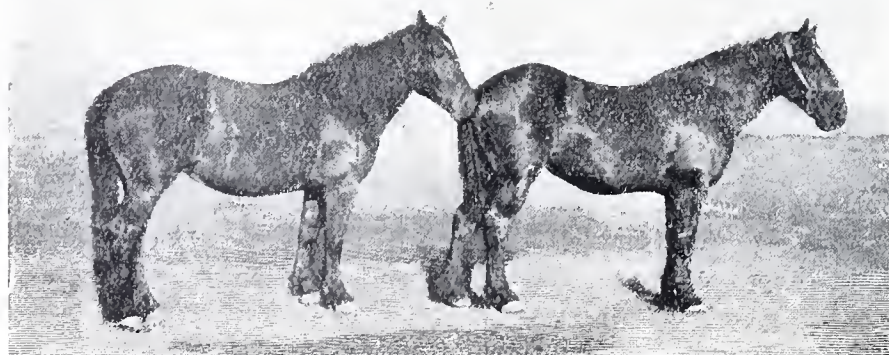
TRADE with Oversea Countries during 1905.

Country.	Imports.	Exports.			
		New South Wales Produce or Manufacture.	Other Australian Produce or Manufacture.	Other Produce or Manufacture.	Total.
	£	£	£	£	£
New Zealand	1,369,001	425,063	36,473	473,125	934,661
United Kingdom	8,602,288	7,252,147	2,575,917	394,358	10,222,422
Other British Possessions—					
Aden	1,757	166	.....	20	186
Burmah ... ..	.....	6,680	.....	125	6,805
Canada	73,443	28,381	10,336	2,742	41,459
Cape Colony	4,546	199,802	1,261	7,613	208,676
Ceylon	274,165	10,431	671	180,269	191,371
Christmas Island	667	1,471	289	1,990	3,750
Fanning Island ... ..	.....	364	30	476	870
Fiji	43,232	103,788	16,496	124,868	245,152
Gibraltar ... ..	.....	2,843	.....	2	2,845
Hong Kong	89,351	126,034	93,389	205,020	424,443
India	443,783	890,303	200,555	48,144	1,139,002
Malta	244	.....	.....	23	23
Mauritius	21,234	8,079	5	144	8,228
Natal	708	160,183	1,802	937	162,922
New Guinea	16,516	7,650	2,691	15,436	25,777
Norfolk Island	1,018	2,543	143	4,698	7,384
Ocean Island	17,731	8,434	6,436	19,254	34,124
Straits Settlements	82,830	58,878	10,976	1,137	70,991
West Indies	8,000	.....	.....	.....	.....
Total, other British Possessions	1,079,225	1,616,030	345,080	612,898	2,574,008
Total, British Possessions ...	11,050,514	9,293,240	2,957,470	1,480,381	13,731,091
Foreign Countries—					
Belgium	222,994	1,455,037	328,123	4,003	1,787,163
Chili	4,061	193,766	274	4,903	198,943
China	28,631	189,081	127,049	2,029	318,159
France	138,028	3,288,280	276,220	5,746	3,570,246
Germany	864,289	2,460,102	302,240	9,054	2,771,396
Italy	73,757	150,395	26,115	260	176,770
Japan	145,257	306,398	44,081	26,972	377,451
New Caledonia	18,399	82,573	14,246	38,627	135,446
Philippine Islands	27,854	172,544	6,702	4,607	183,853
United States of America ...	1,636,069	406,728	172,737	22,680	602,145
Total, leading Foreign Countries	3,159,339	8,704,904	1,297,787	118,881	10,121,572
Total, other Foreign Countries ...	275,270	392,677	119,651	128,539	640,867
Total, Foreign	3,434,609	9,097,581	1,417,438	247,420	10,762,439
Total Trade with all Oversea Countries	14,485,123	18,390,821	4,374,908	1,727,801	24,493,530

While a large export trade already exists between the State of New South Wales and European countries, the United States, and the west coast of South America, every effort is being made to improve the trade relations with Canada and the United States, and other countries. It is, however, in the direction of the Orient that a very large volume of trade may open up for New South Wales in the future. India now receives a considerable quantity of timber and horses, and trade in copper and other products is opening up.

The Japanese are already a manufacturing nation with respect to certain products. It is anticipated, moreover, that as they, and also the Chinese, advance in modern ideas, there will in the future be increased inquiries for wool, meat, and grain from these countries. The exports of frozen meat are without doubt on the increase from Australia, and a very large proportion is from New South Wales. There is always a possibility that European countries which at present practically prohibit the importation of meat, will see their way to alter their policy, and thus open a further extended field for Australian meat. South Africa receives large quantities of mutton and beef, and there is also considerable trade with that country in butter, grain, flour, timber, and frozen poultry and rabbits.

Trade is opening up with the Philippine Islands and China to a considerable extent, and also with the various island groups of the Pacific. And it is anticipated that when cold storage depôts have become established at the leading ports, a considerable business will be done in frozen meats, butter, cheese, concentrated milk, and possibly fruit. While the staple food in the East appears to be rice, it is gathered from reports by the Commercial Agent representing New South Wales, that there is a disposition to vary the food, and consequently wheat and flour, and in some instances meat, are coming more into general use. Hotels in the East, at such places as Shanghai, Kobe, and other important centres, are adopting



refrigerated storage in connection with their establishments, and this means that those who desire Australian meat and game and fruits and other delicacies will be able to obtain them.

The population of Japan alone is over 40,000,000, and China about 400,000,000. Therefore, when it is realised that the 3,000,000 on the vast island continent of Australia, with all

its varied resources, have a prospective market of such magnitude in the East, apart from the trade already done with Europe and America, it becomes very evident that there is a larger market opening up for the exportable surplus of our products than under present circumstances the population of Australia can meet.

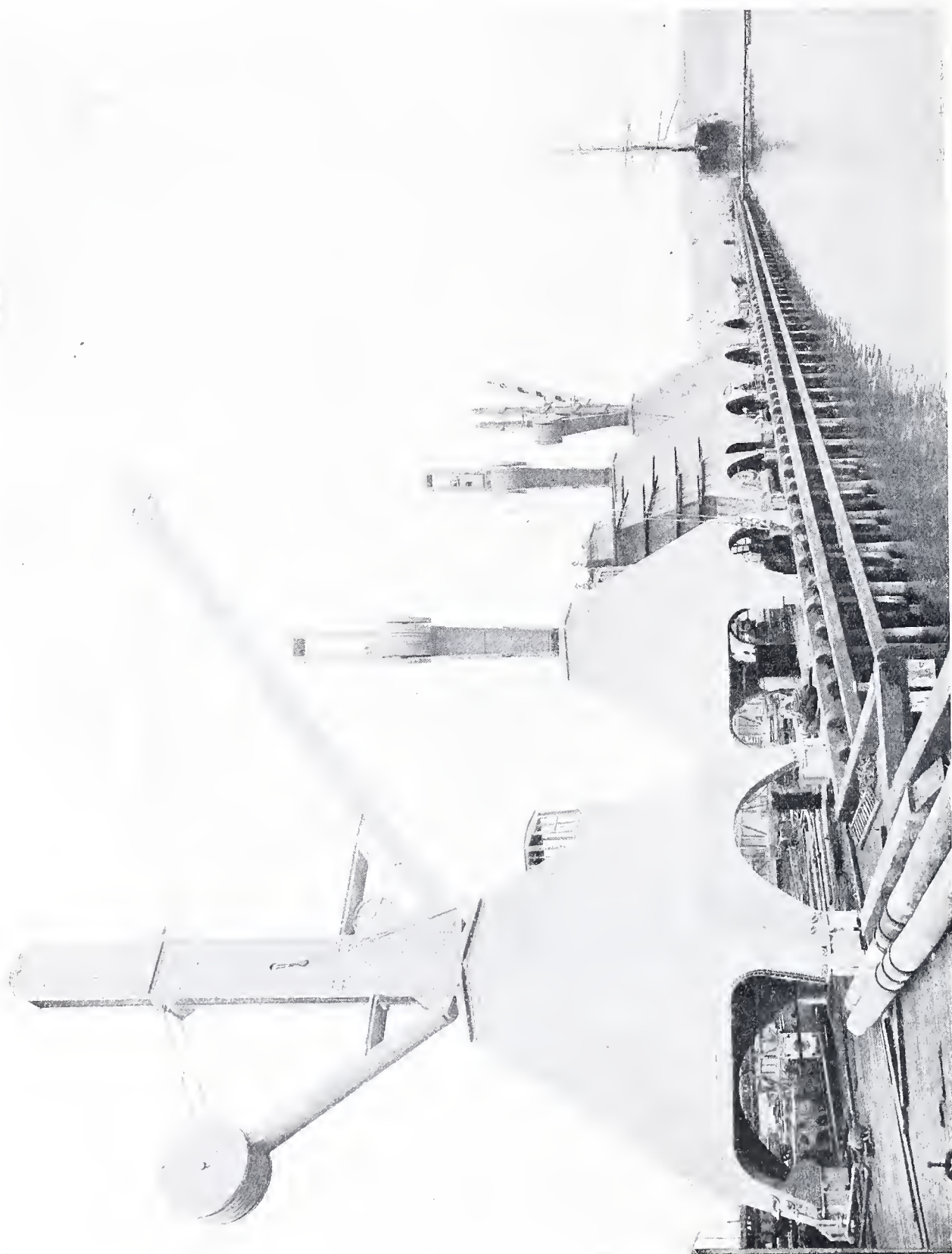


JETTY AT BOTANY BAY.

The New South Wales Government some years ago established a cold storage depôt for the purpose of fostering the export trade in rabbits, hares, poultry, and other food products, and of late years large freezing companies have actively catered for this trade, which is assuming large proportions. The trade in rabbits and hares is growing rapidly, 3,202,109 pairs of rabbits and hares being exported from the State in 1905. The total value of rabbit and hare carcasses and skins was £186,325. The poultry treated for export numbered 17,616 head. As a matter of fact, very large orders were offering for poultry, to which the supply of a suitable character was not equal.

The following table shows the value of some of the principal exports from New South Wales during the year 1905 :—

Exported.	Australian Produce.	Total.	Value of Australian Produce.	Total Value.
			£	£
Animals—Horses No.	5,400	5,461	125,576	126,076
Butter lb.	19,975,065	19,975,125	816,604	816,607
Coal ton	2,020,559	2,020,559	841,577	841,577
Copper cwt.	379,095	379,095	1,258,380	1,258,380
Fruits, fresh cntl.	87,870	89,671	43,632	45,427
Gold—Coined and Uncoined ... ..	.....	.....	2,211,436	2,578,415
Grain—Wheat bushel	4,313,603	4,313,603	727,985	727,985
Flour ton	39,034	39,080	307,876	308,327
Lead cwt.	958,763	958,763	584,829	584,829
Leather ... ..	.....	.....	223,265	227,179
Meats—Preserved lb.	7,331,897	7,346,417	154,712	155,118
Mutton and Lamb lb.	51,532,949	51,532,949	545,415	545,415
Rabbits and Hares prs.	3,202,109	3,202,109	92,853	92,853
Beef... .. lb.	2,089,776	2,089,776	22,752	22,752
Oils—Cocanut tons	5,298	5,298	127,512	127,512
Ores ... ..	.....	.....	519,204	519,662
Silver Bullion oz.	823,452	831,587	95,574	96,524
Silver-lead Bullion cwt.	607,978	607,978	559,120	559,120
Skins—Hides No.	153,458	153,458	158,479	158,479
Sheep „	3,291,516	3,291,516	410,915	410,915
Rabbit and Hare lb.	2,587,668	2,590,101	93,472	93,905
Other ... ..	.....	.....	270,620	270,620
Tallow cwt.	370,581	370,581	442,331	442,331
Timber ... ..	.....	.....	320,740	331,127
Tin cwt.	58,818	58,818	413,664	413,664
Wine gall.	24,538	31,301	7,309	12,340
Wool lb.	230,433,952	230,433,952	11,141,335	11,141,335
Other articles ... ..	.....	.....	766,991	1,573,413
Total ... .. £	.....	.....	23,284,158	24,481,887



HYDRAULIC CRANES AT NEWCASTLE.

So far as the means of export are concerned, the following great steamship companies have extensive establishments at Sydney, and passenger and mail steamers are despatched and arrive to regular time-table:—Peninsular and Oriental Steam Navigation Company; Orient Royal-Mail Steam Navigation Company; Nord-Deutscher Lloyd; Messageries Maritimes; The White Star Line; The Aberdeen Line; A. and A. Line; Oceanic Company; Canadian Australian Line; Lund's Blue Anchor Line; Eastern and Australian Steamship Company, Limited, for Manila, China, and Japan; also the China Navigation Company; The Federal-Houlder-Shire, and Bucknall Lines; Tyser Line, Limited; German Australian Steamship Company; Adelaide Steamship Company, Limited; Howard Smith's Line; Huddart Parker and Company Proprietary, Limited; Australian Despatch Line; Arch. Currie and Company's Lines; Ocean Steamship Company, Limited; Commonwealth Line; Illawarra and South Coast Steam Navigation Company, Limited; The North Coast Steam Navigation Company, Limited; the Newcastle and Hunter River Steamship Company, Limited; and many others. The Interstate and coastal steamers are fitted with the most modern appliances for the comfort of passengers, and satisfactory carriage of goods, including freezing space for perishable products.

In 1905 the volume of shipping entered reached a total tonnage of 4,697,511, while the clearances reached a total of 4,684,108 tons. Various influential associations, representing different branches of trade, have been established, the most important being the Sydney Chamber of Commerce, established in 1851. The objects of the Chamber are to receive and collect information regarding all public acts affecting the interests of the State, with a view to the removal of evils, the redress of grievances, and the promotion of the trade of All merchants, directors, and connected with or interested in commerce, shipowners, shipmasters, traders, manufacturers, and others carrying on business in the State are eligible as members of the Chamber. The Chamber provides for dealing with specific branches of trade or business by means of sectional committees. The Council of the Chamber meet every fortnight for the transaction of usual business. There are numerous agricultural societies throughout the State, and an influential association, known as the Farmers and Settlers' Association of New South Wales, takes interest in matters affecting the farmer, the land laws, and trade in farm products, exercising influence through some 150 branches in the country. This association has its head office in Sydney. The manufacturers of the State have an influential association representing their interests entitled the Chamber of Manufactures.



Following is given an interesting table of the average wholesale prices at Sydney of the principal kinds of agricultural and farm-yard produce during 1904, the latest year for which the figures are available at the time of writing :—

AVERAGE Wholesale Prices at Sydney of the principal kinds of Agricultural and Farm-yard Produce during 1904.

Description.	Jan.	Feb.	March.	April.	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Milling Produce.												
Wheat—												
Milling bushel	2/11½	3/0½	3/0½	3/-	2/11½	2/11¾	3/0½	3/3½	3/5½	3/7½	3/4½	3/4½
Chick "	2/7½	2/8½	2/8	2/6½	2/6	2/6	2/7	2/10	3/-	3/2	2/11½	2/11
Flour—												
Roller—												
New South Wales ½ ton.	8/7/-	7/18/9	8/0/3	7/13/6	7/11/3	7/11/3	7/8/-	7/19/-	8/9/6	8/16/3	8/12/6	8/11/3
Manitoba "	12/-/-	*	11/5/-	*	*	11/12/6	11/12/6	13/-/-	13/-/-	13/-/-	13/5/-	13/7/6
Bran bushel	-/5½	-/6	-/6½	-/6½	-/6½	-/6½	-/6½	-/6½	-/6½	-/7	-/6½	-/7½
Pollard "	-/7	-/7½	-/7½	-/7½	-/7½	-/7½	-/6¾	-/6¾	-/6¾	-/7	-/7½	-/9
Malting Barley (im- ported) "	*	*	*	*	*	*	3/2	3/2	3/2	3/2½	3/2	3/2
Feed Grains.												
Barley (Cape) bushel	2/9	*	2/4½	2/4½	2/4½	2/4½	2/2½	2/-	2/-	2/1	2/1½	2/2½
Barley (Feed) "	*	2/1½	2/3	2/1½	2 1½	2/1½	2/1½	2/2	2/1½	2/1½	2/2	2/2
Oats (best feed) "	2/4½	2/3½	2/2	2/-	2/-	2/1	2/1	2/1½	2/1½	2/3½	2/5	2/4½
Maize "	3/2	2/4	2/5½	2/3	2/1	2/0½	2/-	1/11½	2/1½	2/7	2/7½	2/6
Root Crops.												
Potatoes—												
New South Wales ½ ton.	1/14/6	1/16/-	*	*	*	*	*	*	*	4/15/-	4/15/6	5/15/-
Tasmanian "	3/4/-	2/6/-	2/5/-	2/-/6	1/16/3	1/17/-	2/6/-	2/8/9	2/13/-	2/11/3	3/7/6	*
Victorian "	*	*	*	*	*	*	*	*	*	*	3/10/-	6/-/-
New Zealand "	*	*	*	6/-/-	5/10/-	5/5/-	4/7/6	3/7/6	3/-/-	*	*	*
Onions—												
New South Wales "	2/17/-	2/7/6	*	*	*	*	*	*	*	*	5/15/-	5/4/-
Victorian "	3/3/3	3/2/3	2/15/3	2/6/9	2/9/3	2/13/6	2/8/3	2/11/9	4/10/-	5/14/6	4/15/9	*
Fodder.												
Hay ½ ton.	2/17/6	2/19/6	2/10/-	3/15/9	3/12/9	3/-/-	2/16/3	2/9/6	2/10/6	3/8/3	2/16/9	2/16/3
Lucerne "	2/3/9	2/13/-	2/7/3	2/7/6	2/6/-	2/5/9	2/7/6	2/2/6	2/5/-	2/3/-	2/3/3	2/11/3
Straw "	2/8/3	*	*	*	*	*	*	*	*	*	*	*
Derrick-pressed "	1/17/9	2/-/-	1/10/-	1/18/-	1/17/6	1/15/-	1/12/-	1/11/9	1/12/6	1/11/3	1/18/3	1/12/6
Chaff (Local) "	3/6/9	3/10/6	3/10/6	3/11/6	3/11/6	3/10/3	3/7/9	3/10/9	3/17/6	3/12/6	3/13/-	3/12/3
South Australian "	3/8/6	3/10/-	*	*	*	*	*	*	*	3/13/3	3/6/6	3/12/6
Victorian "	*	*	2/10/6	2/15/6	3/2/6	3/2/6	2/17/6	2/10/-	2/11/-	2/15/-	*	*
Farm-yard and Dairy Produce												
Butter—												
Pasteurised lb.	-/8½	-/8	-/8½	-/8	-/8	-/8½	-/8½	-/9	-/9½	-/9½	-/9	-/9
Prime "	-/8	-/7½	-/7½	-/7½	-/7½	-/8½	-/8	-/8½	-/8½	-/8½	-/8½	-/8½
Dairy "	-/7	-/7	-/7½	-/7	-/7	-/7½	-/7½	-/8	-/8	-/8	-/8	-/8
Pastry "	-/6½	-/5½	-/6½	-/6	-/6½	-/7	-/7	-/7½	-/7½	-/7½	-/7½	-/7½
Cheese—												
Large "	-/4½	-/4½	-/4½	-/4½	-/4½	-/4½	-/4½	-/4½	-/4½	-/4½	-/4½	-/4½
Loaf "	-/4½	-/4½	-/4½	-/4½	-/4½	-/4½	-/4½	-/4½	-/4½	-/4½	-/4½	-/4½
Bacon (factory sides) "	-/9½	-/8½	-/8½	-/8½	-/7½	-/5½	-/5½	-/5½	-/5½	-/5½	-/6	-/6½
Hams—												
New South Wales "	1/0½	1/0½	1/0½	1/0½	-/11½	-/7½	-/9½	-/9½	-/9½	-/9½	-/10½	-/10½
Lard—												
Bladder "	-/4½	-/4½	-/4½	-/4½	-/4½	-/4½	-/4½	-/4½	-/4½	-/4½	-/4½	-/4½
Bulk "	-/3	-/3	-/3½	-/3½	-/3½	-/3½	-/3½	-/3½	-/3½	-/3½	-/3½	-/3½
Eggs—												
North Coast doz.	-/11½	1/-	1/2½	1/4½	1/5½	1/2½	-/11½	-/8	-/7½	-/5½	-/7	-/7½
South Coast "	1/0½	1/1½	1/3½	1/6½	1/7	1/3½	-/11½	-/8½	-/7½	-/6½	-/7½	-/8½
New Laid "	1/3	1/4½	1/6	1/10	1/9½	1/6½	1/1½	-/9	-/8½	-/7½	-/9	1/10½
Poultry—												
Fowls—Roosters pair	4/6	3/6	3/6	3/6	3/6	3/6	3/3	3/3	3/6	4/3	4/-	3/9
Hens "	3/6	2/9	2/9	3/-	3/3	3/3	3/3	3/3	3/3	3/9	3/9	3/-
Ducks (English) "	3/9	2/9	2/9	2/9	2/9	2/9	3/3	3/3	3/6	4/-	4/-	3/6
Geese "	7/-	5/-	5/-	5/-	5/-	5/-	5/6	6/-	6/-	6/3	6/6	7/-
Turkeys—												
Cocks—prime "	12/6	12/6	11/3	8/3	8/3	8/3	8/3	8/3	10/-	10/-	10/-	11/6
Extra prime "	20/9	20/-	18/3	13/-	13/-	13/-	13/-	12/-	13/-	13/-	14/9	14/9
Hens "	8/3	8/-	7/6	7/6	7/6	6/-	5/6	5/9	6/6	7/-	6/9	7/3
Bee Produce—												
Honey lb.	-/2½	-/2½	-/2½	-/2½	-/2½	-/2½	-/2½	-/2½	-/2½	-/2½	-/2½	-/2½
Wax "	1/0½	1/0½	1/1	1/1½	1/1½	1/1½	1/1½	1/1½	1/1½	1/1½	1/1½	1/1½
Pigs—												
Porkers each	31/6	28/-	27/6	30/-	34/6	32/-	24/-	23/6	22/6	20/6	25/-	25/9
Baconers "	69/6	64/-	66/6	63/-	58/6	60/6	33/6	34/6	35/9	37/6	39/-	40/3
Milk gal.	1/-	1/-	1/-	1/-	1/-	1/-	1/-	1/-	-/9	-/9	-/9	-/9

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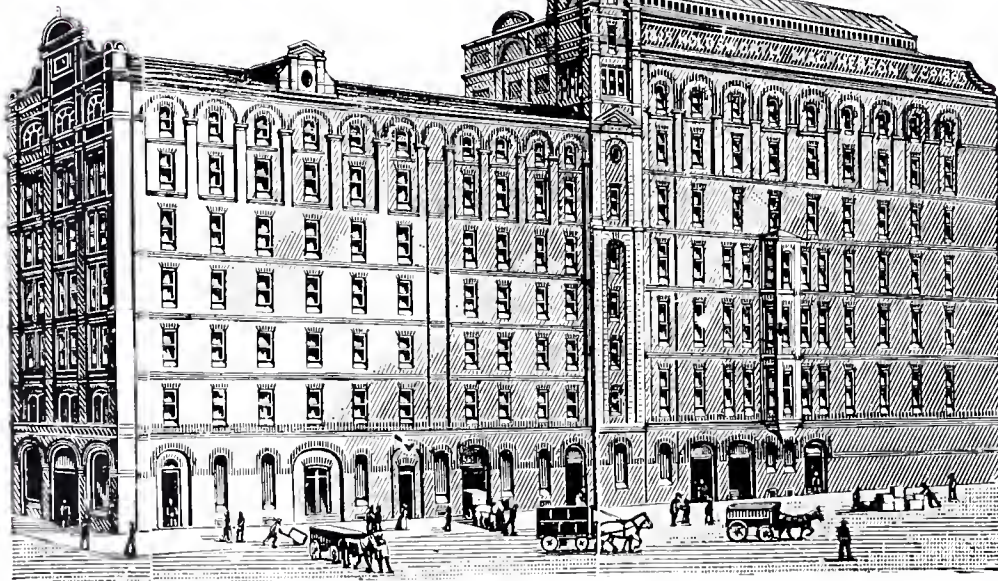
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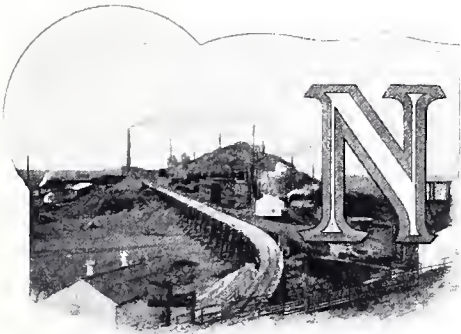
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CHAPTER IX.

Means of Communication.

By HUGH McLACHLAN,

SECRETARY, RAILWAY COMMISSIONERS.



EW South Wales has a valuable asset in its railway property, and as the iron roads are State-owned, they can be devoted primarily to the development of the great natural resources of the State, and to assisting settlers in opening up the country.

The railway history of New South Wales commenced just half a century ago, and, having regard to its population, the State has made much progress in the extension of its lines. To-day it has 3,370½ miles of railway in operation, serving a total population of 1,504,700, or 1 mile to every 446 inhabitants, and as a general indication that this is relatively a substantial measure of enterprise, it may be mentioned that Great Britain has 1 mile to every 1,822 inhabitants.

The railways are built to the standard gauge of the world—4 ft. 8½ in., and are equipped with rolling stock that compares favourably, local circumstances being taken into account, with that existing in any other country.

New South Wales is well provided with means of communication, and **The Country** every centre of importance may be said to be within reach of reasonable **well provided.** transit facilities. Outside the railway area its eastern boundary is washed by the waters of the Pacific, and at intervals rivers or harbours provide ports for the coastal steamer services which run up and down the coast, enabling produce to be taken at a small cost to the metropolitan markets.

Railways also assist to a large extent in providing facilities for coastal settlers, as north and south from the capital the iron roads extend for considerable distances, as will be seen from the map which indicates the railways of the State.

It is, however, inland that the railways have their chief mission, and where they have been of the greatest value in developing the resources of New South Wales. Coastwise,

Nature has provided a waterway which, by permitting of convenient communication, has enabled the rich coastal lands to be advantageously worked ; but the cultivation of the inland areas has only been rendered commercially profitable by the judicious system of railway extension which successive Governments have projected, and it has been possible by State ownership to make the principal object of these inland extensions to assist settlers in the cultivation of the soil and generally to foster the producing interests. This has been done in the first instance by carrying the lines into districts which were capable of development, and then by reasonable railway charges to induce settlement and permit of profitable cultivation.

The railways have not been built purely as a commercial speculation.

Railways not run for Profit. While a reasonable return has been looked for, there has been no desire for profits above the interest on the cost of the lines ; and as profits have followed increased settlement and traffic, the charges have been brought down to the simple interest standard. As an instance of this, it may be stated,



EXPRESS PASSENGER TRAIN.

that during the seventeen years the Commissioners have been in office, since they have power to administer the railways on a business basis, while keeping in view national considerations, the reductions in rates on goods equal at least half a million sterling per annum.

The railways now reach in length 3,370½ miles, and were first strategically laid out by main lines south, west, and north, to provide the benefits of railway communication over the

greatest area of country; but now that the main directions have been covered, a greater desire is shown to construct shorter feeding lines which will tap fertile areas and give facilities for the new settler to have an easy and profitable means of getting his produce to market after harvest.

These main lines stretch to the southern border at Albury, 392 miles, with south-west branches to Hay, 460 miles, and Finley, 454 miles; west to Bourke and Brewarrina, 508 and 518 miles respectively, or mid-west to Condobolin, 335 miles; north to the border at Wallangarra, 492 miles, and to Inverell (north-west), 509 miles. These mileages are mentioned simply



THE ZIGZAG GREAT WESTERN RAILWAY.

to indicate the splendid distances covered by the main lines, and to show the room available for expansion in regard to settlement, since outside the metropolis the population on an area of 198,848,000 acres is still less than 1,000,000.

In addition to these main lines, **Tapping the distant Districts.** feeders exist which cover a great area of country affording spreading room for a large population; and the progressive policy of the country renders Parliament always willing to grant further extensions where reasonable prospects of settlement and traffic are likely to follow—not necessarily the comparatively costly lines fitted for express services, but extensions pertinently called by the Railway Commissioners “pioneer lines,” which are excellently suited for traffic at moderate speeds, and which can be laid down in ordinary country at about £2,000 per mile. Australia has always been willing to recognise the advantages of providing facilities in advance of dense settlement, as she allowed the selection of land before survey, and where fair prospects exist the early settler may reasonably look for facilities being provided to meet and second his own pioneering endeavours.



A Year's Operations.

Reference has been made to the mileage, and a few figures may be given as to the results. In the last financial year, ending 30th June, 1905, the transactions may be summarised as under :—

Miles open	..	..	..	..	..	..	3,280 $\frac{3}{4}$
Cost	..	..	..	..	..	..	£43,062,550
Earnings	..	..	..	..	..	..	£3,684,016
Expenses	..	..	..	..	..	..	£2,192,147
Net return	..	..	..	..	..	..	£1,491,869
Interest on capital	..	..	..	..	..	£3 9s. 3d. per cent.	
Tons of goods carried	..	..	..	..	..	..	6,549,791
Tons of live-stock carried	..	..	..	..	..	..	174,424
Number of passengers	..	..	..	..	..	..	35,158,150
Locomotives in use	..	..	..	..	..	..	623
Goods trucks in use	..	..	..	..	..	..	11,556

In passing, it may be said that the losses or damage to goods in transit have been extremely low, while the immunity from accidents, in proportion to the number of passengers carried, will compare favourably with that enjoyed by any other railway system. This has not been the experience of one year, but of many years, and indicates practically the soundness of the road-bed, the excellence of the vehicles, and the general care of the railway administration and staff in faithfully observing the first duty of all railway managers—the safety of the travelling public.



NEUTRAL BAY.

In regard to the tonnage carried, it is gratifying to record the rapid increase that has taken place in connection with the produce hauled. Ten years ago **Low Freights** for the total under this head was put down at 356,174 tons, while last year the **Long Distances.** tonnage was 662,729, a figure which illustrates, together with the increased area under crop, the greater facilities given by the extension of the lines, as well as indicating the encouragement given by the railway administration to production. One principle that has been followed has been to diminish the rates rapidly in proportion to distance, so as to enable distant areas to compete in the principal markets. For 100 miles, wheat pays, and can afford to pay, 1d. per ton per mile; for 400 miles the difficulty of distance is regulated by the reduction of the rate to less than $\frac{1}{2}$ d. per ton per mile; and, consequently, the newer settler, who has to take his holding farther back from the coastal markets, is placed



TRUCK LADEN WITH WOOL.

on a reasonable footing to compete with others who may be favoured by a shorter haul. The rates for produce—truck loads—for relative distances from the country to the sea-board, are as under:—

100 miles	..	..	..	..	..	..	8s. 4d.	per ton.
200 miles	..	..	..	..	..	..	11s. 8d.	„
300 miles	..	..	..	..	..	..	12s. 8d.	„
400 miles	..	..	..	..	..	..	13s. 6d.	„

For hay, straw, chaff, and green fodder, even lower rates prevail, and in order to encourage high-class farming and production, manures are carried at the low rates applicable to produce. The producer also has the benefit of reasonable rates in getting his implements to his land; for instance, a truck load of agricultural machinery is carried 300 miles for £2 4s. 4d. per ton.

The interests of the fruit-grower, market gardener, or dairy farmer, who **Some** would, as a rule, settle nearer the larger centres of population, have had **Special Rates.** equally liberal consideration. Fruit and vegetables are taken at a rate of $1\frac{1}{2}$ d. per case (say 60 lb. fruit) for 30 miles, or $2\frac{1}{4}$ d. for 54 miles. Milk is carried by passenger train 40 miles for 1d. and 200 miles for 2d. per gallon. Butter, single packages, is conveyed 50 miles for 1s. per cwt. (or 13s. 9d. per ton), or 200 miles for 2s. 3d. per cwt. (or 48s. 2d. per ton); while the thrifty house-wife may get her poultry to market at a rate that enables a good return to be made, the Department supplying a coop capable of holding 12 pairs of fowls or ducks, and carrying them 50 miles for $2\frac{1}{2}$ d. per pair, 100 miles for $4\frac{1}{2}$ d., or 300 miles for $7\frac{1}{2}$ d. per pair.

The Commissioners have been able to give these reasonable facilities largely by the superiority of the rolling stock used. Locomotives have been adopted which haul immense loads, the modern goods engine moving 700 tons at 15 miles per hour on a grade of one in 100, while waggons have been built with a high loading capacity to the tare; a waggon, for instance, weighing 5 tons 18 cwt. having a capacity of 15 tons, or a larger vehicle carrying 24 tons on a tare of 11 tons. The Commissioners are, therefore, enabled to take big paying loads and to afford low freights.

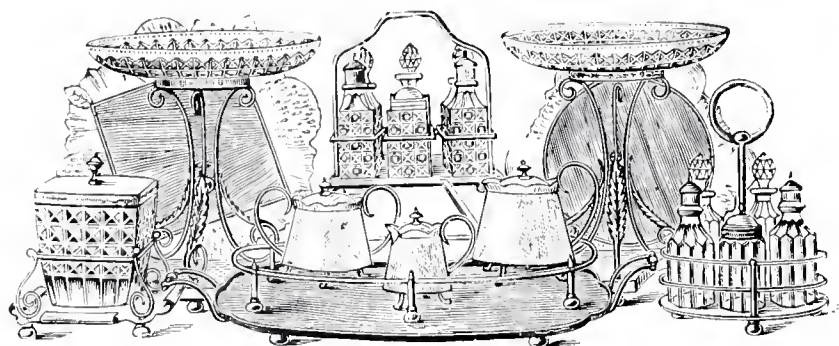
The train services are frequent and the carriage accommodation most **Good Passenger** comfortable, so that the settler is in easy communication with the principal **Service.** centres and able to obtain any necessary facilities for social or commercial intercourse. The ordinary fares are reasonable, while periodically excursion trains are run to and from all stations at 1d. per mile for the return journey ($\frac{1}{2}$ d. per mile each way).

The passenger business is relatively to the settler a matter of less moment than the more vital question of cheap goods freights, but his comfort is greatly enhanced by convenient coaching facilities with parcel arrangements that are within popular reach, and both the postal parcels as well as the railway parcels rates have been fixed throughout to assist inland settlement as far as it consistently can be done. That both have met demands is evidenced by the big traffic under both heads. The number of passengers carried—suburban and country—have already been quoted; while the parcels railway business last year yielded £145,995.





BRIDGE OVER THE BOGAN RIVER BY ROCK TO BREWARRINA RAILWAY.



WILLINGTON BROS.,
PATENTEES.

Silversmiths

... AND ...

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Electro-plated Wares,
ETC., ETC.

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In Gold, Silver, Nickel, Brass, &c.

IMPORTERS . . .

Of Silver, Brass, and Nickel Sheet
Metals, Plain and Fancy Wires,
GLASSWARE, &c.

587, George-street, Sydney, N.S.W.

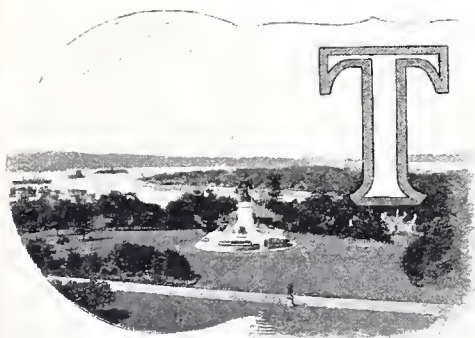
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CHAPTER X.

Industrial Expansion and Trade.

By H. A. SMITH, F.S.S.,

STATISTICIAN'S OFFICE.

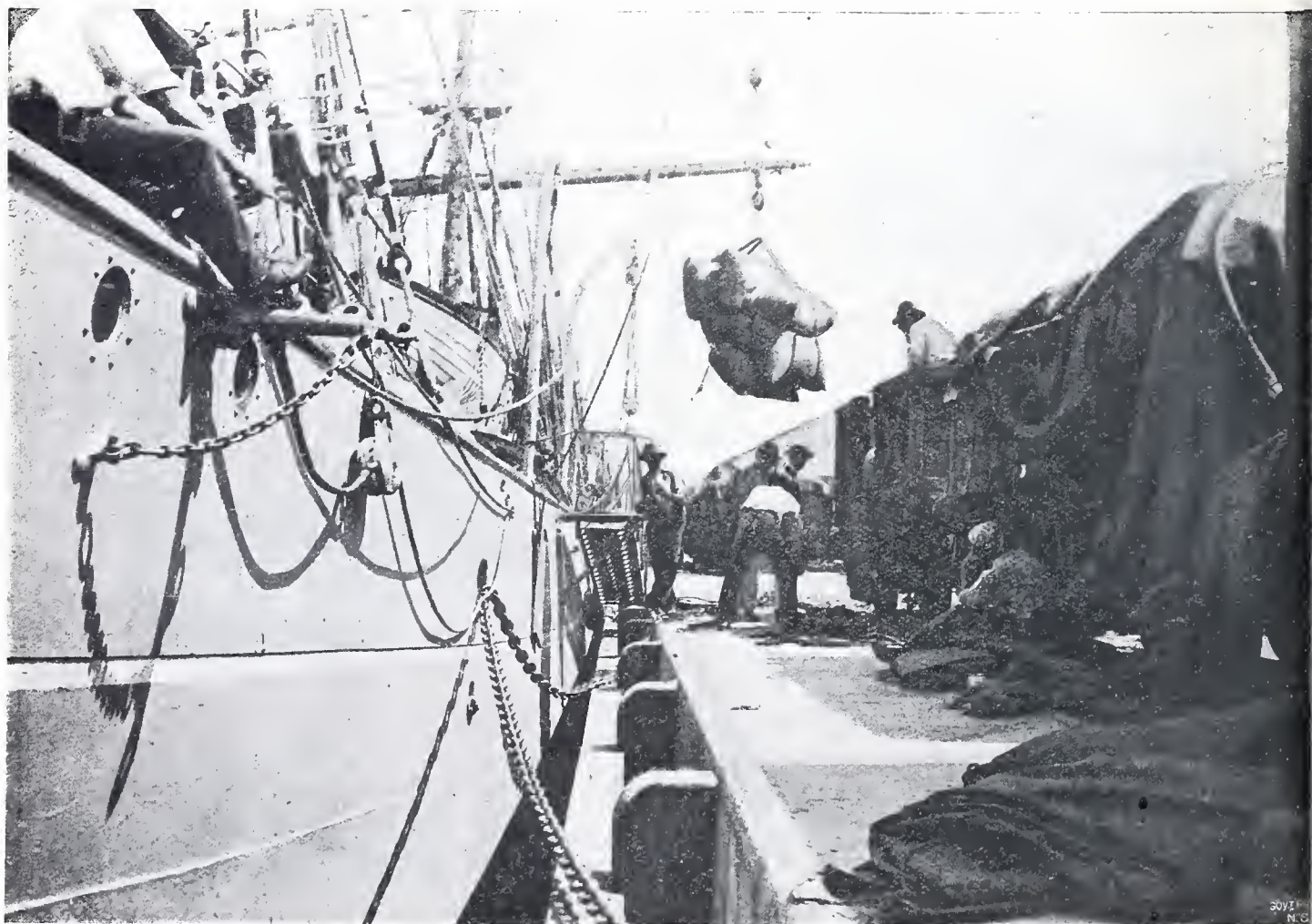


THE discovery of gold in 1851 may be said to mark the beginning of the industrial history of New South Wales. Nevertheless, it must not be thought that the period from the establishment of the Colony in 1788 up to that time was one of stagnation, for there were times of considerable commercial activity and speculation, especially during the second half.

As regards the condition of the workers, it may be said that the period was distinguished by the scarcity of labour and the high wages paid, while at the same time the lot of the labourer was severe. Rents were high, as were prices of commodities, especially those which were imported. Transport and communication were restricted, and, consequently, trade did not increase at all largely. Agriculture was, of course, necessary in order to supply the needs of the early settlers, but the progress was not great, as in 1850 the area under cultivation was only 197,000 acres. Manufacture of articles for local consumption was carried on, and the progress may be measured from the statement that there were 36 industrial establishments and 38 mills in 1829, and 133 establishments and 172 mills in 1848. The principal industries were cloth factories, tanneries, and breweries in the first-mentioned year, with the addition of potteries, meat-preserving works, and iron foundries in the second.

Early in the period, the beginnings of the great pastoral industry were made, so that by 1850 there were in the State over 13,000,000 sheep, nearly 2,000,000 cattle, and a considerable number of horses and pigs. The export of wool rose quickly from 175,400 lb. in 1821, to 2,000,000 lb. in 1830, and 14,000,000 lb. in 1850. Towards the end, especially after 1840, immigration was encouraged in every way, so that the population increased rapidly, and settlement spread.

Gold was discovered in 1851, and the ensuing seven years were marked by **Discovery of Gold.** rapid growth and great change. The depression which had existed for some years previously was swept away, and industrial conditions were revolutionised. The rush of men to the gold-fields, especially those in Victoria, was so strong at first that the towns were drained of their population, the supply of labour was exhausted, and most branches of industry were at a standstill. The period covered by these eight or nine years during which the gold-fever raged also had a great economic effect upon the condition of the labouring classes. Previously, the standard of living had been measured by that prevailing in England, but this was all changed, and the Australian worker established a standard for himself, which is still maintained, without reference to any other country. The gold-fields attracted men of many different occupations, in the prime of life, and most of these after the excitement abated naturally turned to their old callings for employment, while some abandoned their search for gold in favour of other branches of the mining industry, and thus helped to develop the mineral resources of the Colony.



LOADING WHEAT AT DARLING HARBOUR.

In 1853 a regular steam service on the rivers Murray and Darling was inaugurated. This had the effect of greatly lowering the cost of transport, and helped materially to open up the great western division. Exploration in the north-western part of the State was carried on, many fine stretches of country being discovered and made available for settlement. Most of the land was taken up for grazing purposes, and in 1854 the purchase of land for agricultural purposes had almost entirely ceased.

The development of the pastoral industry was retarded to a considerable extent by the desertion of its workers to the gold-fields, but, on the other hand, the miners required to be fed, and thus created a large demand for meat. In 1852 there were about 7,000,000 sheep in the Colony, and in 1861 about 6,000,000, so that the dearth of labour and the demand for meat between them had decreased the flocks by one million during the ten years.

**Neglect
of Primary
Industries.**

Agriculture was greatly neglected during this time. In 1840 there were 126,000 acres under cultivation, while fourteen years later there were only 6,000 more. In 1846 there had been 183,000 acres under crop, so that the industry actually retrogressed during the height of the gold fever. The effect on the manufacturing industry was also detrimental at first, although the subsequent revival was due to the supply of labour drawn from those who had immigrated to the gold-fields. The number of mills and industrial establishments increased regularly from 266 in 1845 to 388 in 1850, then declined to 286 in 1854, after which there was a recovery, and the number in 1858 was 464. No information is available as to the number of hands employed. During the period from 1845 to 1850 the population increased by 46 per cent., and from 1850 to 1858 by 74 per cent.

The large influx of people into Australia led to improved internal communication and means of transport, while the introduction of steam services with other parts of the world and the growth of railways developed trade, and opened up new markets for local produce. Up to 1852 the trade of New South Wales, especially in the imports, was very irregular, but from 1852 to 1858 the imports advanced from £1,900,000 to £6,059,000. The exports did not vary much, being valued at a little over £4,000,000. The imports comprised manufactured goods and luxuries, and the exports almost wholly were raw materials and gold. For the first few years after the discovery of gold the export returns were greatly affected by the quantity of gold sent away, but the industry rapidly declined, owing principally to the depletion of the more easily worked

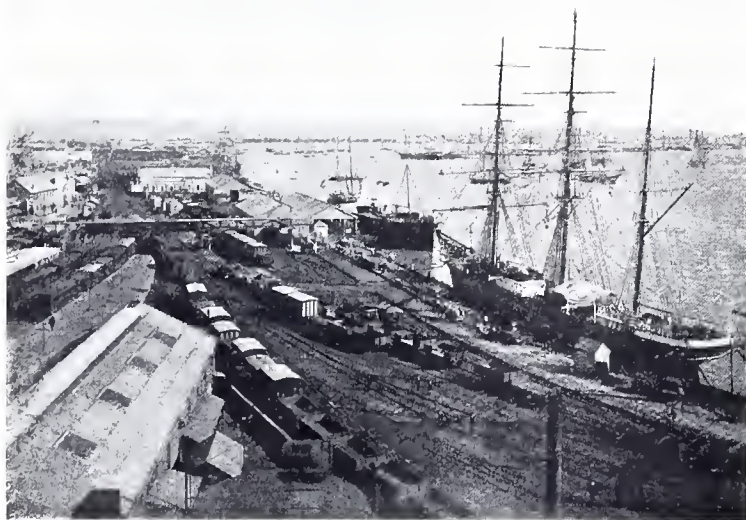


AT CHARLOTTE'S PASS, MOUNT KOSCIUSKO.

deposits and the superior attractions of the Victorian fields. During the eight years ending 1858 the value of gold exported varied from the maximum, £2,660,946 in 1852, to the minimum, £654,594 in 1855.

As might have been expected, there was a reaction after the excitement of the gold discoveries, and the community, while recovering, was naturally somewhat restless. Employment was difficult to obtain, speculation was quiet, and it began to be recognised that the Colony must look in other directions for its future growth. Attention was thus naturally turned once more towards agriculture, the area of land under cultivation increasing from 247,542 acres in 1859 to 302,138 in 1862. The manufacturing industries also made slight progress, the number of establishments being 567 in 1860 and 645 in 1862.

During the next ten years, that is from 1863, conditions were influenced more perhaps



VIEW OF NEWCASTLE HARBOUR.

by the vicissitudes of the seasons than by any other cause, the whole period being one of alternate drought and flood, which had a most harmful effect. The expansion during these years was, therefore, slow; money became dear, population was not attracted in any numbers, land was not taken up, nor was any sustained effort made to develop the resources of the Colony. In 1870 the production of gold only reached £931,016, the lowest value since 1858. The area of land under cultivation was 417,800 acres, or less than six years previously. It is satisfact-

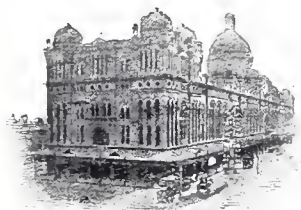
ory to note, however, that the pastoral industry made fair progress. At the end of 1871 there were over 16,000,000 sheep, 2,000,000 cattle, and 300,000 horses, while the export of wool amounted to 65,500,000 lb., and was valued at $4\frac{3}{4}$ millions sterling. The value of tallow exported was £246,000.

These depressing influences having come to an end, however, a change was soon effected. The search for gold was once more carried on with vigor. the production in 1872 amounting to £1,644,177, while copper and tin received attention almost for the first time. Agriculture and cattle-breeding expanded, and the demand for land became spirited, a sure sign of the increased growth

of the primary industries. The price of wool was high, and consequently sheep-breeding was very profitable. Also, about this time the necessity was seen for pushing on with public works. Railways, roads, and bridges were built which opened up the country, improved the means of transport, and thus made the markets more accessible to the producer. Coincident with all these developments, wages were high, prices of food comparatively low, and employment steady. Many persons were attracted to the State, and the rate of increase of the population soon doubled. There was a great demand for labour, and to accommodate it a vigorous immigration policy was carried on. All these conditions, which brought about a great deal of real progress, prevailed until about 1883 or 1884, after which matters declined. Wages began to fall and employment was difficult to obtain, especially in the building trades. The expenditure on public works ceased to a large extent, and thousands of men were thrown out of employment. In several of the collieries there were disputes and strikes, and in 1890 there were two great strikes, which very much disturbed the pastoral and shipping industries, while in 1892 another strike threw idle the Broken Hill Silver Mines for three months.

The production of gold fell away to £317,000 in 1888. The price of wool was falling steadily, but the industry was still very profitable up to 1884, as the flocks increased largely. However, after that year, prices continued to fall, and this adversely affected the pastoral industry, as there was little or no reduction in the price of production and cost of transport.

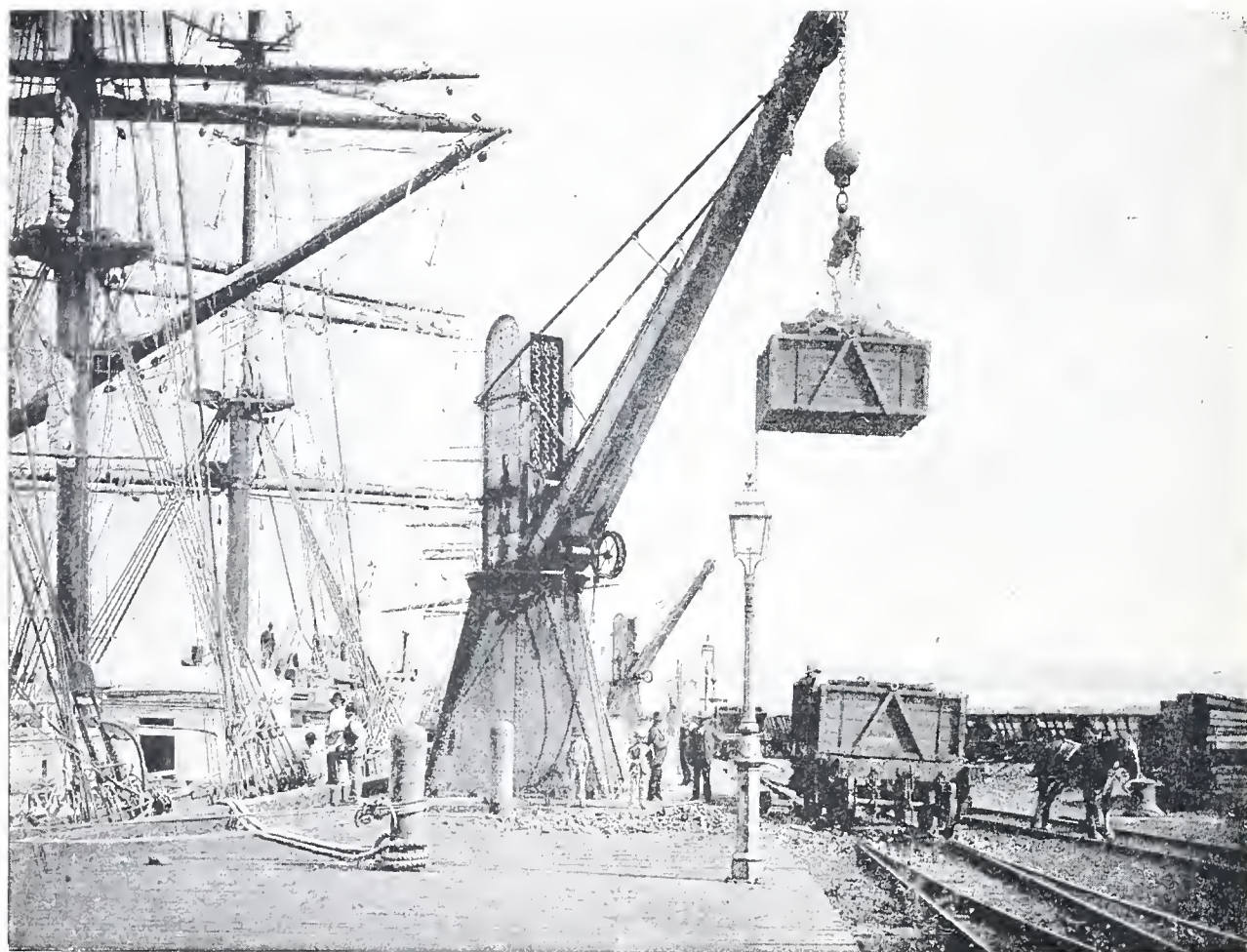
The restriction of expenditure and the lack of activity in the primary industries culminated in the financial crisis of 1893, which was more or less inevitable. The works previously referred to were paid for out of capital introduced by the State and by much of it was invested in whole amount introduced was legitimately, so that rash financial values were created for same time the labour market the high wages paid on these rural occupations. The effects altogether evil. Although many persons suffered reverses of fortune, affairs, especially in business, were placed on a much sounder basis than had been the case for several years. Employment was scarce in the towns, and men were forced to turn their attention to the primary industries, and the recovery would have been rapid but for the unfavourable seasons which afflicted the pastoral industry. In 1891 the Colony possessed the largest number of sheep on record, viz., just under 62,000,000, but during the next eight years this number decreased to 36,200,000. In 1899 there was a sharp rise in the price of wool; it declined again next year, but the number of sheep increased, only to decrease again during 1902 and 1903, owing to a prolonged drought. However, that has passed away, and in two years the number of sheep has increased by nearly 40 per cent., from 28,500,000 to 39,500,000. The



VICTORIA MARKETS.

price of wool which is now higher than at any time since 1899, promises to continue high; the average weight of the fleece, which is now $7\frac{1}{2}$ lb., is getting steadily heavier, and the present prospect of the pastoral industry is, consequently, extremely hopeful.

After 1893, very much increased attention was directed to agriculture, so **Improvement in Agriculture.** that the area under cultivation grew rapidly, and doubled in the ten years ending 1903. During one year, 1898, there was an increase of nearly 400,000 acres in the area. At the end of 1905 the area under cultivation was 2,838,000 acres. The total is not perhaps very high, only amounting to about 2 acres per head of population, but it must be remembered that, up to the present, New South Wales has been essentially a pastoral country, and agriculture has ranked as only of secondary importance, notwithstanding that there is plenty of good land, and that in spite of droughts the defects of the climate are not serious. The chief drawback has been the size of the country, and the difficulty of access to markets. The principal crop is wheat, the area under which is considerably more than half the total. For many years the cultivation of



LOADING COAL BY HYDRAULIC CRANE AT NEWCASTLE.

wheat was very uncertain, and up to 1898 New South Wales did not produce enough for local consumption. Since that year, however, there has been a great expansion, and under normal conditions there is a surplus available for export, the average of the last two years having been over 9,000,000 bushels per annum.

There was also a great expansion in mining after 1893. Many forsaken gold-fields were once more tried by men anxious to obtain a living, and mines were more vigorously worked, so that in 1894 the value of produc-

tion was doubled, £1,000,000, a figure remained, approxi- The production of silver-lead, copper, by a decline in last year the prices have been high, and greatly increased. The manufacturing to 1886 showed number of establishments in the latter year being number of hands



QUEEN VICTORIA STATUE, SYDNEY.

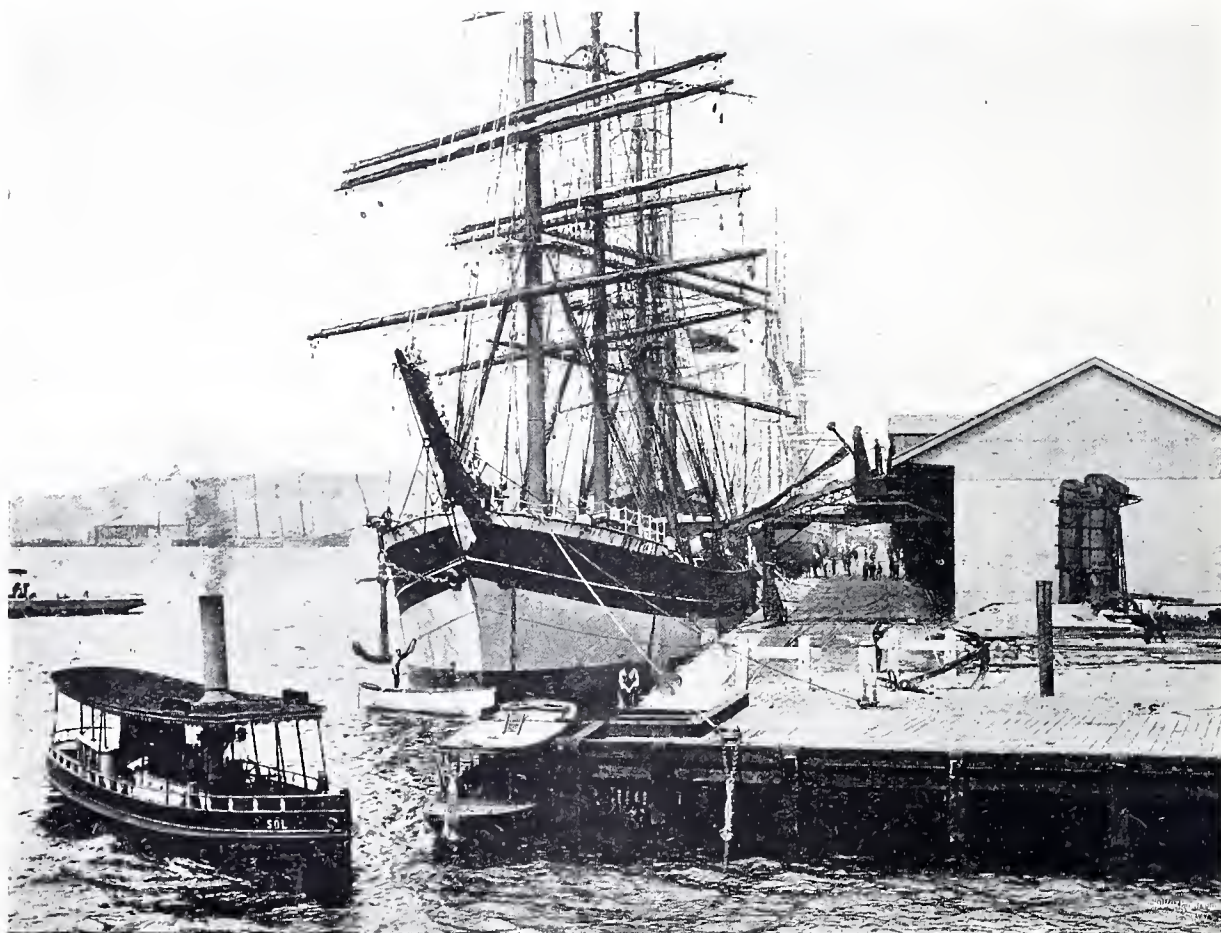
and exceeded at which it has maturely, ever since. the other minerals, and tin, was affected prices. During the of industrial metals there has been activity in mining. industry from 1880 steady progress, the shipments in the 3,541, and the employed 43,500,

From this on to 1893 there was a decline, the number employed in that year being 42,000, but there has been, since, a consistent increase each year, although a slight check was experienced in 1902 and 1903 amongst the industries treating raw materials. The total number employed in 1905 was 72,000, comprising 56,000 males and 16,000 females. Over 75 per cent. of the females are employed in occupations which are peculiarly their own, namely, tailoring and dressmaking.

Growth of Dairying. The dairying industry has made great strides during the last ten years or so, and is chiefly pursued in the coastal districts of New South Wales. The advance has been most marked on the North Coast, which is most suitable for dairying, and where, so far, only the outskirts have been touched. Between 1895 and 1904 the output of butter in the State increased from 23,300,000 lb. to 53,600,000 lb., the output for the latter year being the largest on record. Prior to 1890 a considerable quantity of butter had to be imported to meet the local requirements. But from that year an export trade was commenced, the surplus increasing from 281,000 lb. in 1890 to 4,000,000 lb. in 1894, and 22,000,000 lb. in 1904. In 1905 there was a slight falling off. The bulk of the produce is exported to the United Kingdom, but a profitable market is also found in South Africa and the East. The export of butter is now so large a factor of Australian trade that the shipping companies in competing for its carriage have very much reduced their freights. The manufacture of cheese is not neglected, as 4,626,000 lb. were produced in 1905.

According to the returns of the last census, in 1901, the total population of New South Wales was 1,359,133, of whom 266,973, or nearly 20 per cent., were employed in productive industries, namely, 31,907 in pastoral pursuits, 18,135 in dairying; 77,619 in agriculture; 38,382 in mining; 6,811 in other primary pursuits; and 94,119 in manufactures and allied processes. In 1861, just after New South Wales was restricted to its present boundaries, the population was 350,860, and the number employed in productive industries about 96,000, of whom 39,395 were engaged in agriculture; 14,507 in pastoral pursuits; 21,382 in mining; and 20,623 in manufactures.

During 1905 the total value of production from all industries was **Value** £46,692,000, equivalent to £31 11s. 6d. per head of population, a figure not **of Production.** equalled by any country outside Australia. This total compared with £15,379,000 the value in 1871; £25,180,000 in 1881; and £38,952,000 in 1901. It must be remembered, however, that prices were over 40 per cent. higher in 1871 than in 1905, and about 22 per cent. higher in 1881. If the 1871 prices had prevailed in 1904 the value of production would have amounted to over 65 millions, and if the 1881 prices, to nearly 57 millions. The value represents the amount received by the producers for their output at the place of



LOADING WHEAT AT DARLING HARBOUR BY GRAIN ELEVATOR.

production, and of the total in 1905, £17,113,000 was the return to the pastoral industry; £6,611,000 to the agricultural; and £3,123,000 to the dairying. The output of manufactories, being the value added to the raw materials, was £10,598,000.

The expansion of the
Trade. trade of New South

Wales has, of necessity, been lightly touched upon, but it will perhaps be seen better from the following table, which shows the shipping and commerce figures at ten-year intervals since

1861. The surest test of the progress of a country like New South Wales, where the surplus production is exported in the raw condition, is the rise or fall in the value of exports of domestic produce, as these are affected by the rise or fall in prices. Wool is the great staple, and any fluctuations in price are immediately reflected in the volume of trade:—



IN THE NATIONAL PARK.

Year.	Shipping entered.		Trade.				
	Number of Vessels.	Tonnage.	Imports.	Exports.	Total.	Exports of Domestic Produce.	
						Value.	Per head.
			£	£	£	£	£ s. d.
1861	1,327	366,236	6,604,069	6,609,461	13,213,530	5,016,891	14 4 0
1871	1,891	706,019	9,935,067	11,261,219	21,196,286	9,227,108	18 3 1
1881	2,254	1,456,239	17,587,012	16,307,805	33,894,817	11,955,277	15 12 6
1891	2,602	2,752,157	25,383,397	25,944,020	51,327,417	21,085,712	18 9 3
1901	2,760	4,133,200	26,928,218	27,351,124	54,279,342	19,915,884	14 10 4
1905	2,725	4,697,511	29,424,008	36,757,002	66,181,010	28,039,666	18 19 3

In 1861, 1,327 vessels were required to conduct the trade of New South
Shipping. Wales. In 1905 the number had grown to 2,725. A more definite idea of the growth of trade is obtained, however, when it is stated that in 1861 the tonnage of the vessels that entered the ports of New South Wales was 366,236, while in 1905 the tonnage was more than twelve times as large, namely, 4,697,511. The size of vessels has been constantly increasing. In the first year the average capacity of each vessel was 275 tons. At the present time the figure is 1,724 tons, and several vessels over 10,000 tons now enter the port of Sydney regularly.

**Character
of Trade.**

Of the total value of trade shown, about 40 per cent. is with the other Australian States, the remaining 60 per cent. representing the direct overseas trade. The total trade grew steadily in volume until the maximum point per head of population was reached in 1891. The trade of that year, however, included exports of wool held over from the previous year on account of strikes. In the years up to 1891 the imports, owing to external borrowings by the Government and private investors, increased so that they often exceeded the exports. After 1891 the volume of trade declined somewhat, and in 1901 the import figures were inflated owing to loading up by merchants in anticipation of the Federal tariff, which was imposed towards the end of that year. In 1905 the value of trade reached its highest point. The imports, exports, and the exports of domestic produce were higher than ever before. Relatively, the exports of domestic produce have never been exceeded and only approached once. Judged by the volume of its exports per inhabitant, New South Wales compares favourably with any other country in the world. An average export of over £20 per head is exceeded by no other country except Belgium, which carries on a very large transit and re-export trade.



SWING OF THE PYRMONT BRIDGE, DARLING HARBOUR, SYDNEY.

New South Wales has not developed large manufacturing industries, a great part of the establishments being domestic industries, or those for treatment of perishable products, and practically nothing is manufactured for export



SILVER-LACED WYANDOTTES.

abroad. There is a large field open for the advancement of manufactures in New South Wales, seeing that it produces the raw materials for many kinds of necessities. The great drawback lay in the smallness of the market on account of the limited population, but with the federation of the Australian States and the consequent abolition of the State tariffs, the market has been extended, and an improvement is seen in the expansion of the Interstate trade of New South Wales. In 1899, just prior to federation, the exports to other Australian States of New South Wales manufactured produce were worth about £380,000. In 1905 the value had grown more than fourfold, to £1,577,000. The chief trade of New South Wales, however, is with countries outside Australia. Of its total oversea trade during 1905, which was valued at £38,978,653, that with the United Kingdom was worth £18,824,710; with Germany, £3,635,685; France, £3,708,274; United States, £2,238,214; India and Ceylon, £2,048,137; and New Zealand, £2,303,662.

Articles of Export.

In view of what has been already referred to, it is not surprising to find that the great bulk of the domestic exports comprise goods more or less in a raw state. Of the total export during 1905, the following were the chief items:—Wool, £11,362,515; leather, £392,401; tallow, £420,150; skins and hides, £845,909; meats, all kinds, £868,053; animals, living, £2,234,864; butter, £708,155; wheat, £955,686; flour, £382,652; gold, bullion and specie, £1,231,926; copper, £575,270; spelter, concentrates, &c., £1,345,259; silver-lead bullion, £543,513; silver-lead ore, £161,792; lead, £464,811; tin, £265,969; timber, £337,922. Of the imports during 1905, £14,938,885 came from the other Australian States, of which £13,356,420 was the produce of those States, and £1,582,465 the value of British and foreign produce re-exported to New South Wales. Of the Australian produce a large part was intended to be subsequently transhipped abroad. The total imports for home consumption amounted to £20,606,672, or £13 18s. 8d. per head of population. A study of the import list suggests the great scope which exists for the cultivation of products now imported, and especially the room for expansion in the manufacturing industries.

A few of the principal articles will show this, the following representing the values of the articles specified :—

Articles of Import.	Apparel and soft goods, £3,808,381 ; arms and ammunition, £235,515 ; boots and shoes, £290,978 ; cheese, £21,245 ; drugs and chemicals, £178,448 ; fancy goods, £106,119 ; hats and caps, £202,142 ; leather, £204,705 ; leather manufactures, £49,303 ; metal manufactures, £1,146,087 ; machines and machinery, £933,075 ; implements and machinery—agricultural, £264,025 ; iron and steel, £530,558 ; paper, £392,538 ; potatoes, £333,976 ; onions, £57,424 ; vegetables, fresh, £51,410 ; milk, condensed, £78,213 ; timber, £514,006 ; wood manufactures, £59,126.
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In addition to the oversea trade in home produce, there is a fairly large re-export trade in provisions and manufactured articles of British and foreign production with New Zealand, New Caledonia, Fiji, and the other islands of the Pacific, the value of such having amounted to £578,966 in 1905.

All the facts which have been cited herein go to show how marked has been the advance of New South Wales in all directions of productive industry. Notwithstanding the severe trials she has had to undergo in the way of adverse seasons and financial troubles, she has managed to survive them all, and has come out after each one stronger than before. The bad seasons have been followed by good ones and the recovery has been remarkable. Just as is now the case, there has always been caution and lack of enterprise immediately after a reverse, but this has quickly passed away, and it is hoped that the present high prices for almost all staple produce will continue as an incentive to production, when there will be still greater progress in all branches of industry, tending alike to the advancement of the State and the prosperity of the whole community.





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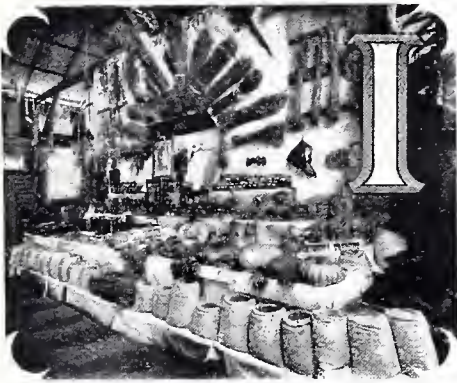
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CHAPTER XI.

Agricultural Possibilities.

The Coast District—The Southern and Central Tablelands—The Northern Tableland—The North-western Slope—The Western Plains—Use of Fertilisers—The Agricultural Map.

THE COAST DISTRICT.



IT may be safely asserted that New South Wales can produce, within its own borders, almost everything that is needed for the sustenance, the comfort, and even the highest luxury of mankind. This is due no less to its great variety of soils than to its wide range of climate. The high and regular rainfall of the North Coast District—50 to 75 inches—operating in combination with the genial warmth of its mean summer temperature of 75° Fahr., and its mean winter mildness of 58° Fahr., upon the rich alluvial soils of the Tweed, Brunswick, Richmond,

Clarence, Bellinger, and Macleay Rivers, has produced a luxuriance of vegetation which may be compared with the jungles of tropical Africa, Asia, and South America. When this natural wilderness has been subdued by man, it becomes the home of the sugar-cane, tea, coffee, cotton, pineapple, mango, and most of the fruits, fibre plants, and other economic products of sub-tropical regions.

Fertility of soil depends on much the same conditions in New South Wales as in older countries—(1) sufficiency of plant-food, humus, and water; (2) a suitable admixture of clay and sand to ensure good tilth; and (3) good texture to allow percolation and capillary action. The soils along the river banks, being the result of the decomposition of the igneous rocks forming a large proportion of the mountain range that bounds their watershed, are so rich that they have yielded heavy crops of sugar-cane, maize, and other exhausting crops for two generations without the aid of manure. The undulating country, stretching from the coast to the foot-hills, varies in quality according as it is derived from basalt, trap, granite, schists, or shales, or sandstone, but the great bulk of it, in its natural state, whether scrub or forest, gives valuable timbers—teak, pine, bean-tree, cedar, rosewood, fallow-wood, and many others suitable for fencing, for building, for street-paving, and for the finest cabinet work. Both scrub and brush when cleared are soon covered with a pasture of native and exotic grasses so rich and luxuriant that it has already made the North Coast a great rival to the South Coast, which is the oldest dairying district of New South Wales.

Introduction of Grasses. The enterprise of settlers, aided and stimulated by the Department of Agriculture, has introduced some grasses of such value that the dairying capacity of many sections of this district has been raised to one beast per acre, and even the once neglected hill-sides now run a beast to 5 acres without aid from artificial feeding. In fact, nature has been so kind to the present generation of dairy farmers on the North Coast that they do very little farming in the ordinary sense. They milk the cows and take the milk to the nearest creamery, or separate it themselves and take the cream to the nearest factory, but they do very little cultivation. They grow little hay, and few fodder crops for green feed for summer or winter, when there may be a shortage of natural grasses. They cut the paspalum grass for its valuable seed, but instead of conserving the straw, either for feed or for bedding, many of them burn it or let it rot. If they grow a patch of maize



HARVESTING.

it is not often for green feed for the cattle, but for the grain for the Sydney horses; the stalks, the cobs, and the husks are all burnt, and vast stores of fertility in the form of humus and nitrogen are thereby driven off into the air.

The greater part of the Richmond River soils are of volcanic origin, over-lying basalt. Taking the average of a number of analyses, the capacity for water may be taken as 52 per cent.; the humus, 16 per cent.; phosphoric acid, .3 per cent.; nitrogen, .3 per cent.; lime, .21 per cent.; potash, .08 per cent. The amount of the last mentioned element of fertility is not satisfactory, but the other figures indicate a degree of fertility comparing well with the richest sugar-cane soils of Queensland, and about three times as great as that of the average soils in the neighbourhood of the metropolis. These rich virgin soils often make rich settlers but poor farmers. In the older districts, where the soils have been impoverished by several generations

of thriftless men, different methods have now to be pursued, the aid of science is being invoked, and a new class of farmers is being bred, who have to grow feed for their cattle, manure their soil, conserve surplus fodder in times of plenty, utilise by-products and all elements of fertility, and generally conduct their farming operations on principles approved by the centuries of experience of older lands. The Wollongbar Experiment Farm of 400 acres, on the Richmond River, is expected to do good work by introducing improved varieties of fruits and crops already grown in the district, and new ones of economic value: by exhibiting improved methods of farming, by providing good sires to raise the standard of the dairy cattle, and by training a number of lads year by year in the science and practice of sub-tropical agriculture. The average area of the holdings in this district is 246 acres, and 73 per cent. of them all are held and worked by the owners.

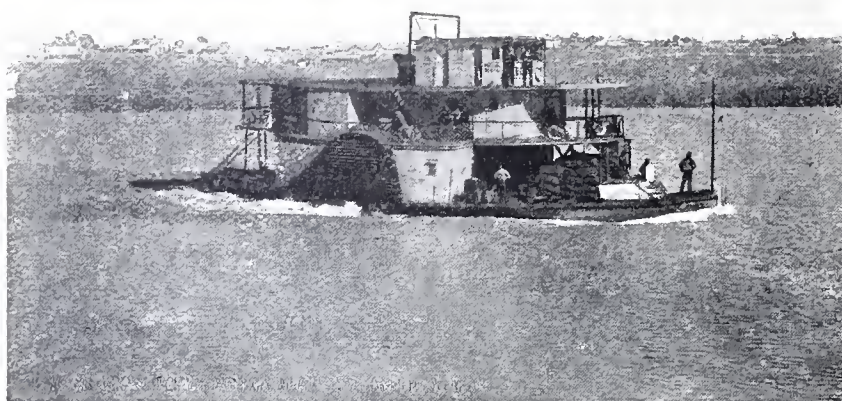


The country between the Macleay and Hunter Rivers contains a greater proportion of sandstone spurs and ranges than that further north. The **Fertile Valley.** valley of the Manning is very fertile, and enjoys a climate and rainfall which make it one of the richest districts in the State, famous alike for its oyster-beds and its maize crops. But there is also a fair amount of inferior land on the ridges and among the mountain ranges that is valued at present more for its timber resources than for its potentialities in pasture and crops. At the same time it is certain that much of the hilly and ridgy country in this and other parts of New South Wales, that is now despised and rejected by our rather fastidious selectors, is in no way inferior to many districts of Europe which support large populations by a system of intense culture, and that the day will come when, after all the rich lands shall have been closely settled and fully developed, these tracts of soil of second and third quality will be eagerly sought for by a more highly educated, more thrifty, and more systematic generation of agriculturists than the present, to whom the soil has hitherto presented few problems needing more than brave hearts and strong arms.

The Hunter Valley is one of the oldest and still one of the most fertile and prosperous districts of the State. The rich seams of coal which have **Deep** been developed very extensively near the mouth of this river have made **Alluvial Flats.** Newcastle the second city of the State, and a worthy rival of its namesake in the old land. The great mineral wealth of the district has attracted a population of over 60,000, which will certainly grow, and the feeding of which will give scope to the agricultural potentialities of the splendid country extending from Maitland to Muswellbrook. Its deep alluvial flats form the ideal home of lucerne, of which they yield as many as seven cuttings in the year, each equal to about 1 ton of hay per acre. Yields of 80 to 120 bushels of maize per acre are not uncommon. Dairying is, of course, very profitable, and, consequently, the capital value of the land along the river's banks has reached £20 to £40 per acre, even £80 being paid

for small choice blocks. Much of the valley is liable to floods, which follow heavy rains in the upper part of the watershed, and a very rich dressing of silt is sometimes left behind to the depth of 2 inches, which analysis shows to be so rich as to be equal to a manuring for most crops for ten years. The farmers, would, however, prefer to miss both the flood and the silt, since one may get coarse sand for his share, and another the rich fine silt—the washings of farms and hill-sides higher up the valley. The damage done to growing crops, and the hindrance to

the routine cultivation of the farms more than outweigh the benefit of the extra 2 inches of top-dressing, which may be disregarded on soil which is 20 to 50 feet deep. The main range of mountains at this point recedes from the coast 100 miles, and the higher parts of the valley with the foot-hills have long furnished very good grazing for sheep; but the profitable merino is now making way for the Durham or the



ROYAL MAIL STEAMER, MURRAY RIVER.

Ayrshire or the Jersey, especially round Singleton, Muswellbrook, Aberdeen, Scone, and Murrurundi, whereby more families are settled, more labour is needed, the gross yield per acre has increased three to ten times, and the net profit is much larger, so that the capital value is steadily appreciating. For the English farmer, who has capital enough to buy an improved block of land, this fertile valley, with its rich soil, good and generally regular rainfall, equable climate, proximity to good markets, settled conditions, and suitability for a good system of mixed farming, presents attractions equalled by no other district in New South Wales, except, perhaps, the South Coast district from Wollongong to Bega. But it is no place for the man with small means, who expects to get a big estate for little money. The average area of holdings in this district is 267 acres.

The section of the Coast District between the Hunter River and Wollongong, embracing the Metropolitan area, has, for its chief geological features, the great beds of Hawkesbury sandstone and Wianamatta shales. The Blue Mountains, which bound this district on the west, consist almost entirely of very bare sandstone ridges, with occasional outcrops of basalt at Mount Hay, Mount Tomah, and Mount King George, giving rise to rich patches of red chocolate soil that form veritable oases of rich vegetation amid the vast expanses of stunted and

gnarled trees, poor scrub, and characteristic vegetation, that invariably indicate the poor and shallow soils of sandstone country.

Along the banks of the Hawkesbury, and in some gullies, there are deep beds of alluvium, generally made up of sandy *debris* of the adjoining mountains, mingled with some better stuff brought down by one of the tributaries from the southern tableland. On these flats the comparative poverty of the soil, chemically speaking, is amply compensated for by the depth, which gives an ideal foraging ground for lucerne and all deep-rooting plants, which can go down to the cool pebbly subsoil for moisture, and can explore, perhaps, 30 feet of light sandy loam in search of nutriment. Any one who has seen the lucerne and maize and orchards of Emu Plains, Richmond, Windsor, and other parts of the Hawkesbury valley, growing in light but deep sandy loam, will realise that a comparatively poor but kindly soil, 10 to 20 feet deep, is preferable to a rich but shallow soil lying on a harsh and impervious clay. This river, also, is very liable to heavy floods—sometimes reaching 40 feet—which are capricious in their action, and sometimes very destructive. One part may be enriched with a fine silt, which is generally of a chemical value about half that of the Hunter River, while another may be covered with a bed of water-worn boulders and gravel of basalt and granite, and a third be smothered with a thick coating of coarse sand. Generally floods are a dreaded evil, and no Hawkesbury farmer feels safe who has not some high land behind his rich flats, to serve as a site for his house and farm buildings, and a refuge for his stock in times of stress. The oldest farms in Australia are in this valley, which supplied the food of the infant settlement round Sydney Cove over a century ago. Here also, near Richmond, was started in 1891 the first Agricultural College in New South Wales, which is slowly educating the conservative “Cornstalks” of this decadent district how to develop the capabilities and restore the fertility of soils partially worn out.

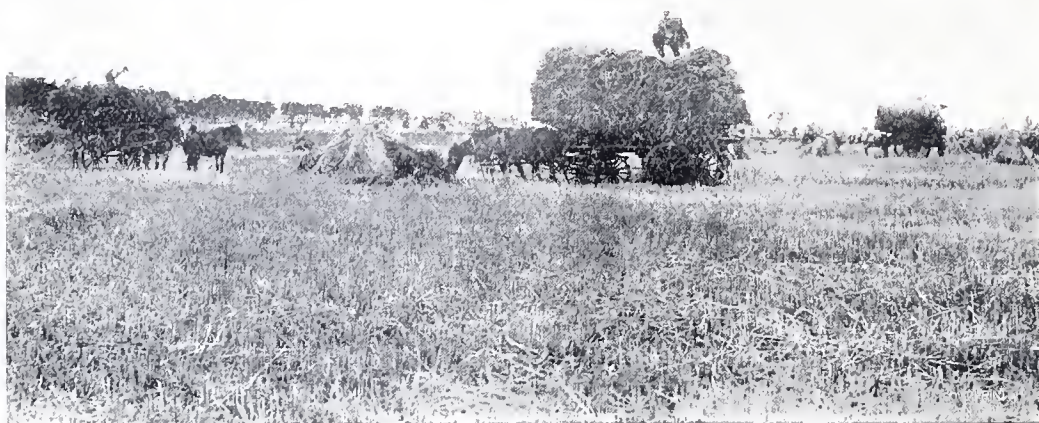
Sydney, the handsome capital of the State, is blessed in its unequalled situation for commerce and trade, but its geological and agricultural surroundings are less

happy. Where the shales replace the sandstone, there is usually a heavier but shallow loam, with a stiff clay subsoil. With sub-drainage these loams grow excellent grapes and summer fruits. They give very fair grazing and grow good timber, but their shallowness makes them susceptible to dry weather, and

chemically they are always deficient in phosphoric acid and lime, and generally less than one-third as rich in the elements of fertility as the soils of the North Coast.



BUSH CHILDREN GOING TO SCHOOL.



LOADING HAY IN THE FIELD.

An average of a large number of analyses of sandstone soils from the counties of Cumberland and Camden, made by the Chemist of the Department of Agriculture, shows that they are generally acid in character, have a capacity for water of 50 per cent. ; humus, 7 to 11 per cent. ; lime, .1 per cent. ; potash, .066 per cent. ; phosphoric acid, .137 per cent. ; and nitrogen, .133 per cent. The soils derived from the shales have generally twice as much potash, slightly more lime and nitrogen, but considerably less phosphoric acid. The whole district, 30 miles north, south, and west of Sydney, is of inferior agricultural quality, the only patches and pockets of first-class soil being found in the vicinity of the rather numerous dykes and outcrops of basalt and dolerite that occur in this area.

The proximity to the metropolis, however, gives even these third-rate soils a value of their own for growing fruit and vegetables, for dairying, poultry farming, and all forms of "petite culture." With the aid of deep tillage, liming, green manuring, good cultivation, intelligent fertilising, and drainage, these soils can be greatly improved, their capacity for water increased, and they can be profitably cultivated with the more remunerative crops. The new generation or the improved breed of farmers—the product of all our Agricultural Colleges and Experiment Farms—is going to do wonders with such soils as these, which are now shunned because not understood. To one who has seen the intense culture of Italy, France, Germany, and Switzerland, where every square yard of soil is made to produce something, where the grape-vines are trained in festoons between the poplars that stand as posts in the dividing lines, where the steepest hill-sides are terraced for the growth of—here an olive-tree, there a fig-tree, anon perhaps a few tomatoes—to such a one little imagination is needed to see the whole of this coastal district, with its glorious climate and rainfall of 30 to 60 inches, covered with thousands of small farms and gardens, and supporting a dense population of prosperous and contented yeomen, whose boys will gape in wonder when grandfather tells them how Sydney, when it had only 500,000

inhabitants at the close of the 19th century, had to depend largely on America for its canned fruit and asparagus, and many of its implements, and on other States for much of its best bacon and cheese, its jams and raisins and wines, its hops and barley and oatmeal, its manufacturers of iron and wool, and many other necessities of life. The average area of the holdings in this Central Coast District is 54 acres, the smallest of any large district in the State, comprising as it does many orchards and market gardens.

As we travel down the South Coast we traverse a tract of country between Clifton and Mount Kembla which can supply the world with coal for centuries to come. Thick seams are visible in the cliffs that set bounds to the encroaching Pacific. Numerous tunnels pierce the mountain spurs, and short railways bring the coal direct to the colliers as they lie in the small harbours at Kembla and Wollongong. About 30 miles below Sydney we get into better agricultural country again, where basalt has overflowed these carboniferous strata, and quickly note the change in natural vegetation, in trees, and pasture. We are in beautiful Illawarra, where dairying has been a stable and profitable industry for sixty years past. Kiama is the centre of rich basaltic hills, clothed with rich rye grass and clover pastures which rarely show the withering touch of drought or frost. Here the spurs come down to stop the inroads of the ocean waves, and the railroad has to find its way through many dark tunnels. The range recedes and there rich meadows appear, which will favourably compare with the best in the old world. The immigrant will note the interest the splendid cattle, now



fixed in type, and famed far and wide throughout Australia as the Illawarra breed. He will find some pure Ayshires and graded Durhams, but generally a cross between the two. At Nowra, the terminus of the railway, he may see Jerseys bred to such perfection that a cow's record of 14 pounds of butter in a week is a common boast. Along the rich flats of the Shoalhaven River may be found some Holsteins, which would recall to a Dutchman the placid beauty of his home in Holland. In the rough and lovely country where the Shoalhaven rises are great mineral riches; along the banks near its mouth are alluvial deposits, which have given splendid yields of lucerne, maize, potatoes, and meadow grasses for three generations.

Below this river is a stretch of poor sandstone country, interspersed, however, with outcrops of igneous rocks, which have made several good patches at Tomerong, Wandandian, and elsewhere. Sterility of soil may arise from absence or deficiency of chemical elements necessary for plant growth, bad mechanical conditions, or the presence of injurious constituents. Fortunately

neither this district nor any other in New South Wales is sterile owing to the last cause, as, for example, the alkali lands of California are, but merely on account of deficiency of the elements of fertility, especially phosphoric acid and lime. The time will come when even this sandy and gravelly country will have a modest value for growing certain fibre-plants, and trees for firewood and essential oils.

A Prosperous and Restful District. When one gets to the igneous rocks of the Ulladulla District, he finds a very fertile but narrow strip of country, where well-grassed hills, the densely timbered gullies in which the red cedar once flourished, a series of lagoons well stocked with fish, and nestling amid trap ridges and fertile meadows,

all combine to make this one of the most charming spots in the State—an ideal resort for the tourist, and a prosperous and restful district, famous for its stalwart lads and bonny lasses, who commenced to swarm off from the parental home some thirty years ago to subdue the big scrub of the northern rivers, and do their share in developing the latent wealth of that rough and unknown district.



A COUNTRY SHOW-GROUND.

Like To the south of Ulladulla there is a stretch of inferior soil at present valued principally for its fine timber, in which settlement for dairying is sparse till the Clyde River is reached. Then comes the rich Moruya District, well watered and fertile, famous alike for its granite quarries and its rich pastures.

Devonshire. Further south we come to the Tuross River and the Bodalla estate, the scene of the pioneering labours of Thomas Mort, one of the most far-seeing and public-spirited citizens that New South Wales has produced. An Englishman arriving in this charming district might easily imagine himself in Devonshire or Cheshire. It has long been favourably known for its quality of cheese and bacon, and the fine strain of its Holstein cattle. The same industries have been found to be peculiarly adapted to the whole of the coast district as far south as Two-fold Bay, which, in the early days of the Colony, was the centre of the whale-fishing industry. The granitic outcrop round the Bega River makes rich flats, which produce heavy crops of ucerne and maize, and rarely suffer from the short dry spells that visit even the highly favoured South Coast. The undulating country on both sides of the river gives good pasture to the large herds of Jerseys and Ayrshires which make Bega a household name for excellence of dairy produce.



BULLOCK TEAMS ARRIVING AT A RAILWAY STATION.

The Coast District of New South Wales is in many respects the most highly favoured part of the State. Though it embraces only a narrow strip, it naturally contains the larger part of the whole population. The metropolis unhappily holds over half a million, more than one-third of the whole, Newcastle and suburbs has more than 60,000, and there are many towns of fair size, such as Granville, 5,440; Kempsey, 3,000; Lismore, 6,000; Liverpool, 4,250; Maitland, 11,000;



CORUNNA CREEK, NEAR BODALLA.

Parramatta, 13,000; Penrith, 3,600; Grafton, 6,800; Hamilton, 6,000; Wickham, 5,500; Merewether, 5,000; Lambton, 3,400; Bega, Berry, Campbelltown, Wollongong, Kiama, Windsor, Plattsburg, Muswellbrook, Nowra, Wallsend, Waratah, all ranging between 2,500 and 3,500. It is deplored by all lovers of their country that the statistics of to-day show that while Sydney and suburbs contain 36 per cent. of the total population, other towns, 222 in number, containing over 500 people each, account for 33 per cent., and the rural

districts only 31 per cent. The aim of statesmen is to do everything possible by judicious legislation, by the education of the youth, and by every legitimate encouragement to rural workers, to promote agricultural settlement, and thereby alter these percentages.

The development of the coastal district during the past thirty years has been in every way satisfactory. While the average area of the 75,672 holdings in the State is 635 acres, that of the half (37,156), which are on the Coast, is slightly over 200 acres, being 246 for the North Coast, and as low as 124 in Raleigh, the best country in it, 223 acres for the whole of the South Coast, but only 168 in the Camden District; 154 in Northumberland, and 46 in the County of Cumberland.

The improvement in farming methods, the commercial, scientific, and industrial developments of late years in the matter of rapid transit to the markets of the old world, refrigeration, knowledge of fertilisers, greater use of machinery, extension of railways, improvement of harbours and steamer communication, all have combined to make farming more profitable and more stable, to increase the social attractions of country life, and incidentally to reduce the "living area" needed in the agricultural and dairying districts. The incidence of a land tax on unimproved values, and the oft recurring dread of a graduated land tax, have had their influence in bringing

A Social Evolution.

about the subdivision of the large estates aggregated under the provisions of unwise land laws, and the closer settlement of the coast district, also the tablelands where mixed farming—wheat with sheep—is beginning to do for that district what dairying has done for the coast.

Thirty years ago there was a dread of over-production in butter, but the timely arrival of the separator and cold storage—in the local factory, on the railway car, and in the coasting steamer—revolutionised this industry, and opened up the markets of Great Britain, so that to-day we know that we have practically an unlimited outlet for all our dairy produce. When, after forty years of continuous cropping and grazing without any fertilising, the good soils of the early settled districts showed signs of grave deterioration, people abandoned the old farms and sought for new land. The Government met the crisis by organising a scheme of agricultural education, establishing in 1891 a college and experimental farm at Richmond for the metropolitan area, another in 1892 at Wollongbar for sub-tropical districts, and in 1897 a stud farm at Berry for the improvement of dairy herds, whereby the younger generations have been enabled to learn how to deal with new and more difficult conditions. Improved communication—by road, by rail, and by sea—has brought better markets, and new industries have been opened up.

The mineral resources of the coast in the way of gold, iron, coal, and kerosene shale have been developed, smelting works have been established, secondary industries and manufactures have increased, so that to-day the Coast District of New South Wales is second to no part of Australia, and inferior to few parts of the world in potential wealth, in actual productiveness, and in social advantages. Its products range from gold and silk and ostrich feathers to iron and coal and wattle bark, from pineapples and wine and mangoes to potatoes and condensed milk and cheese. Some twenty-three years ago a batch

of stranded Italians, who were thrown on to our hospitality by the failure of the De Ray colonising expedition, got an opportunity of settling on some waste land of sandstone and shale formation between Woodburn on the Richmond and Harwood on the Clarence. The soil seemed to consist principally of stiff clays, hungry sands, and ironstone gravel. No self-respecting New South Welshman of the old school would take such land as a gift with the attached condition of residence and effective occupation. But these forty-six Italians, inured



SALTBUSH.

to the much harder conditions of their crowded country, gladly selected 3,030 acres of this unpromising soil, and settled with their boys and girls and babies to the total of 202 souls. They were thrifty and industrious, sober and persevering, and well versed in all branches of intense culture. To-day the whole place—well called “New Italy”—is like a slice of old Italy transplanted to this similar clime. Each home has its garden that produces garden stuff and fruit in rich profusion and endless variety. They have introduced the subsidiary industry of silk production, which has always failed in the hands of Australian men and women. The settlement is prosperous and contented, and forms a striking testimony to the possibilities of large areas of similar land now neglected, provided the right men get there.

Colonists of this stamp could get a comfortable living off 5 acres of rich soil of first quality, and 50 acres of fourth-rate stuff. New South Wales
Sic Fortis can accommodate and will welcome thousands of such men, whether they
Etruria Crevit. come from England or Scotland, Ireland or Wales, Italy or Scandinavia, France or Germany, Switzerland or Holland. The first motto of the infant colony was “*Sic fortis Etruria crevit*” (’Twas thus that Etruria grew mighty), and what was true of ancient Italy will ever apply to this young land. “In this way, and by means of such men, will New South Wales grow and develop into a mighty nation!”



PUNTING SUGAR-CANE ON THE CLARENCE RIVER.

THE SOUTHERN AND CENTRAL TABLELANDS.

From the South Coast district we climb up the spurs of the Monaro Ranges, and reach the Southern Tableland, a region of high plateaux, intersected by ranges of mountains, one of which—the Snowy Range—rises to 7,350 feet in Mount Kosciusko. The Tableland falls rapidly away towards the coast, gradually towards the Hunter Valley in the north, and very gently towards the great plains in the west. From Bombala to Cooma we find rocky country interspersed with rolling downs of basalt, slate, and limestone, open forest country of granite formation, forming light soils and sweet country specially adapted to sheep, English



HARVESTING AT WAGGA WAGGA.

fruits, and mixed farming, with here and there a good tract of well-watered plains, well adapted for dairying on special lines. The winter climate closely resembles that of Great Britain, but the summer shows a higher range of temperature. Frosts begin as early as April, and persist often to November, making the summer too short for crops like maize, and too risky for many fruits. The rainfall varies between 25 and 34 inches, the greater half of the rain falling in the first three and the last three months of the year.

At Cooma, which is over 2,600 feet above the sea, we get the branch
A vast Area railway that leaves the main southern line at Goulburn, which is slightly
of over 2,000 feet above the level of Sydney. The whole length of this branch
Wheat Country. line (130 miles) is through hilly and stony country, well adapted to fruit-
culture and grazing, and here and there good stretches of high-class agricul-
tural land. Following the Great Southern line from Goulburn almost due west to Harden



A MOUNTAIN DAIRY.

(94 miles), we fall 700 feet, passing through fine pastoral land into a vast area of excellent wheat country, stretching to the south, west, and north, as far as the 20-inch rainfall warrants the growth of that cereal. In connection with the wheat-belt, study the rainfall map, and note that wheat is often

grown successfully with 16 inches of rain, provided always the greater part of it falls between May and November. The experience of South Australia amply supports this theory. From Harden a connecting line goes north to join the Great Western line, and passes Young, Grenfell, Cowra, and Blayney, each the centre of large areas of undulating country of granitic, basaltic, or slate formations, timbered with white and yellow box, pine, and some eucalyptus, and peculiarly adapted for the growth of all cereals, fruits ranging from cherries and apples to peaches and grapes. Where a few years ago the merino was sole king, and a few pastoralists held areas of 10,000 to 50,000 acres for grazing alone, to-day there are hundreds of farmers growing wheat on the "shares" system, or getting a living by cultivating areas of 100 to 300 acres on a system of mixed farming suited to the conditions of the climate. The process of subdividing these large grazing estates is going on, and in this way hundreds of families will be provided for, the return per acre will be increased fourfold, the social advantages of closer settlement will brighten the lives of the farmers and their wives and families, and agriculture will become more stable; the railways will earn higher interest, and the general prosperity of the whole State will be increased. Cowra is the site of an Experimental Farm, which is expected to do yeoman service in solving many of the problems of the farmers on the tablelands enjoying a rainfall of 25 to 30 inches. Especially valuable are the experiments here carried on with regard to the breeding and fixing varieties of wheat best adapted to the climatic conditions of New South Wales.

If we follow the Southern line from Harden through Cootamundra, Junee, Wagga Wagga, to Albury, on the Murray River, we see a class of land—

Ideal
Agricultural
Land.

a rich red loam—of which there are no less than 20,000,000 acres in the State, all admirably suited for a system of farming with wheat and sheep, and much of it ideal country for the growing of olives, peaches, apricots, figs, apples, prunes, pears, and pre-eminently grapes, from which are made raisins and sweet wines of first quality. At Wagga Wagga there is an Experiment Farm and School, second to none in Australia for the practical value of the work done on the farmers' behalf. Its results

in growing and drying fruits, its experiments with cereals as to manuring, better cultivation, new varieties and improved methods, have been of great educational value, and consequently it is always full of farmers' sons anxious for a good training in practical agriculture. From Cootamundra one branch line leads south into rather hilly country through Gundagai to Tumut, a wonderfully fertile district, producing tobacco, maize, and potatoes, with a marvellous range of fruits, including strawberries equal to the best grown in Aberdeenshire, cherries and berries of all sorts as good as one could get in Kent, and yet peaches and tomatoes and grapes such as an Englishman would expect to grow under glass. Another branch line runs north to Temora and Wyalong, through typical wheat country equal to anything within the 20-inch rainfall belt.

**A Dream
to be
Realised.**

From Junee a branch line goes west 60 miles down a gentle slope of 400 feet to Narrandera, whence another branch goes south-west for 100 miles, falling another 200 feet to Jerilderie, Berrigan, and Finley, round each of which, in spite of a low rainfall, wheat-growing is making headway. From Narrandera to Hay, the present terminus of this South-western line, the railway practically follows the Murrumbidgee, descending 270 feet in 107 miles, all good



PLANTING POTATOES.

grazing country, and capable of enormous development in the production of cereals, fruit, wines, and dairy products, by means of irrigation from the river—a dream which one of the largest landowners, Sir Samuel McCaughey, is even now bringing within the realm of practical agriculture after years of patient endeavour. Away 150 miles east of this, amid the hilly country near Bowning, is the site of the great reservoir at Barren Jack (a corruption

of the aboriginal term Burren Yeack—a precipitous mountain), in which the Government propose to impound a great sheet of 20 square miles of water 200 feet deep, larger than Sydney Harbour, which will replenish the Murrumbidgee and subsidiary channels in summer, and thus irrigate by gravitation such an area of good soil as will support 100 families where one now lives its lonely existence, and all will be co-related to the canals already made by the private enterprise of a patriotic and far-seeing citizen.

From Blayney, where the Western line of railway junctions with the branch line that connects it with the Southern railway, we may travel through **The Wheat-belt's Western Fringe.** excellent wheat country for 129 miles as far as Dubbo and Trangie on the north-west, the tableland falling away from 2,800 feet to 700 feet in that distance. Orange, 20 miles beyond Blayney, is the centre of a district famed for its English fruits and mixed farming. A branch line goes thence west 139 miles to Condobolin, sloping away 2,200 feet in that distance, and throughout the whole distance there is noticeable a growing practice of breaking up the large grazing estates into farms of



STANDING CROP, WAGGA WAGGA.

300 to 1,200 acres, adapted for a system of mixed farming—wheat and sheep. A reference to the rainfall map will show that generally the country which is below 800 feet on the western slopes of this tableland, is also outside the 20-inch rainfall limit, which is usually recognised as the wheat belt. This must be taken with modifications, as the experience of South Australia, and also of some parts of the Riverina in the south-west part of New South Wales, proves that wheat may be profitably grown with a 16-inch rainfall,



provided the greater part of the rain comes in the spring and early summer, not in the first half of the year. The tendency of the past twenty years has been to push the wheat zone out farther and farther west, where the red loamy soil is so rich and peculiarly adapted for wheat-growing, that the risk of an absolute failure, perhaps once in seven years, is deliberately taken.

The Limestone Country. On the return journey by the Western line, from Blayney to the metropolis, we pass through Bathurst (2,200 feet), one of the districts first settled after the road was found over the Blue Mountains ninety years ago. The Experiment Farm established here twelve years ago has demonstrated the possibilities of the granitic soils of the district for the growing of fruit, wheat, barley, and other crops, and the rearing of high-class crossbred sheep and lambs for the English market. From Wallerawang a branch line goes north through limestone country, already the home of large industries in lime and cement, to Rylstone, Havelah, and Mudgee—long famous alike for the merino flocks which find an ideal home in this hilly country, and for the dairy herds which thrive on the intervening rich lucerne flats.

The line in returning from Bathurst to Sydney has to ascend 1,300 feet in 70 miles, traversing country of inferior agricultural value, but rich in coal, iron, limestone, and other mineral wealth, till the poor sandstone ridges of the Blue Mountains are reached. Their lovely gullies are highly prized as tourist resorts in summer, alike by the people from the moist and muggy coast district and by those from the dry western plains. The eastern slope falls 3,000 feet in 30 miles, presenting a succession of country homes of Sydney residents, but no land capable of agricultural settlement till the level of the Nepean, the upper course of the Hawkesbury, is reached, and we enter the central coast districts in which Penrith marks the limit of the metropolitan area.

The average area of the 5,052 holdings in the southern tableland is 750 acres, and of the 5,621 on the south-western slope is 841 acres, of the 8,228 on the central tableland is 407 acres, and of the 3,684 on the central western slope is 642 acres. The total area of land in these tablelands and western slopes, which has been alienated by the Crown, is over 14,200,000 acres, divided among 27,585 occupiers, a number which will have to be largely increased before it can be said that this fine tract of country is effectively and advantageously settled.

THE NORTHERN TABLELAND.

The Northern tableland may be defined as that which is north of the Hunter River Valley, traversed by the Great Northern railway in its gradual climb from Muswellbrook (at 480 feet) through Murrurundi (1,550 feet) to Werris Creek, from which a branch line goes north-west through the heavy black soil of the Liverpool Plains, passing Gunnedah, Boggabri, Narrabri, and Moree, considerable centres of rich agricultural potentialities. At the last-mentioned there is an Experiment Farm, intended to show the possibilities of irrigation by means of artesian water, and the results already achieved give great promise of what may be attained by the aid of the vast stores of underground water when applied with skill and knowledge to the rich soils of these north-western slopes.

The line here turns abruptly to the east, and ascends through very good country, blessed with a rising rainfall, till it gets to Inverell, at an elevation of 1,900 feet, with a rainfall of 30 inches, the centre of one of the most fertile districts in Australia. This is the scene of the first experiment in closer settlement by the Government of New South Wales, where the Myall Creek estate of 66,688 acres was resumed and subdivided into 138 farms, which have been sold at an average price of £2 8s. 8d. an acre, and would be worth seven times as much with such soil,



A SCHOOL CLASS PLANTING POTATOES.

climate, and rainfall, if within easy access of a great market. Between Inverell and Glen Innes there is a rise of 1,600 feet in 42 miles, through rich and well-watered basaltic valleys, which are now held by a few graziers, but will soon support a large population. The main line, after leaving Werris Creek, goes through Tamworth, a thriving township, the centre of a very large district, eminently suited for wheat-

growing. Its growth and development have been much checked by the proximity of the Peel River estate of 330,000 acres, which has reared many sheep but few men and women. This is now being gradually cut up into suitable areas of 500 acres for grazing and mixed farming, down to 100 acres of rich river flats fit for lucerne and maize, which will readily sell at £4 to £15 per acre, respectively, and will some day support a population of at least 800 families.

The history of this estate is typical of the process of development through which many similar districts are passing—the aggregation of immense areas of land of high potential value, but cheap in price because of its remoteness from any market, and its fitness for grazing only; gradually comes appreciation through the advance of settlement, the improvement in means of communication supplied by the State, the inevitable subsequent subdivision into farms for



TRANSPORTING TIMBER COFF'S HARBOUR.

intense cultivation, the introduction of new industries, and the settlement of a comparatively large population.

When gold was discovered fifty-five years ago, New South Wales, which then included the present States of Victoria and Queensland, had a population of not more than 150,000. It was considered by many to be overerowed. The agricultural output had overtaken the demand. Prices were low, wages were reduced, and the star of Australia's prosperity seemed to have reached its zenith. The discovery of gold at once changed all that.

Adventurous spirits soon penetrated the remotest parts of the country in search of hidden wealth. They ultimately found it in the form of wool and wheat as much as in golden nuggets. The squatter or pastoralist became the pioneer, the small farmer followed. To-day, with slightly over ten times



CANE-CUTTING.

that population within New South Wales alone, every thinking man recognises that the country is carrying only a small proportion of the population it can support. All statesmen agree in advocating Immigration, Irrigation, and Closer Settlement. The large grazing areas are being cut up into "living areas," and though our production of wheat and butter has far exceeded our own needs, no man fears a glut of these and other universal

necessaries, for are not the markets of the world open to us under conditions generally as favourable, when all points are considered, as those enjoyed by any of our rivals.

After leaving Tamworth (1,280 feet) we rapidly ascend the Western New England. Tableland, rising 2,300 feet in 48 miles, and traversing the rich tract of country appropriately called New England from its climate and productions. Round the cathedral town of Armidale (3,265 feet), and all the way to Glen Innes (3,520 feet), and Tenterfield (2,830 feet), near the Queensland border, there is a tract of hilly country, second to none in Australia for its sweet sheep-pasture, and containing a large proportion of rich flats and rolling downs which grow all English fruits and farm crops to perfection.

The climate in winter is very similar to that of Great Britain, in summer it has a higher range of temperature. The average rainfall of this district is about 35 inches. Dairying is steadily extending, and will succeed if pursued under English conditions, with



A MOWING CLASS, AGRICULTURAL COLLEGE.

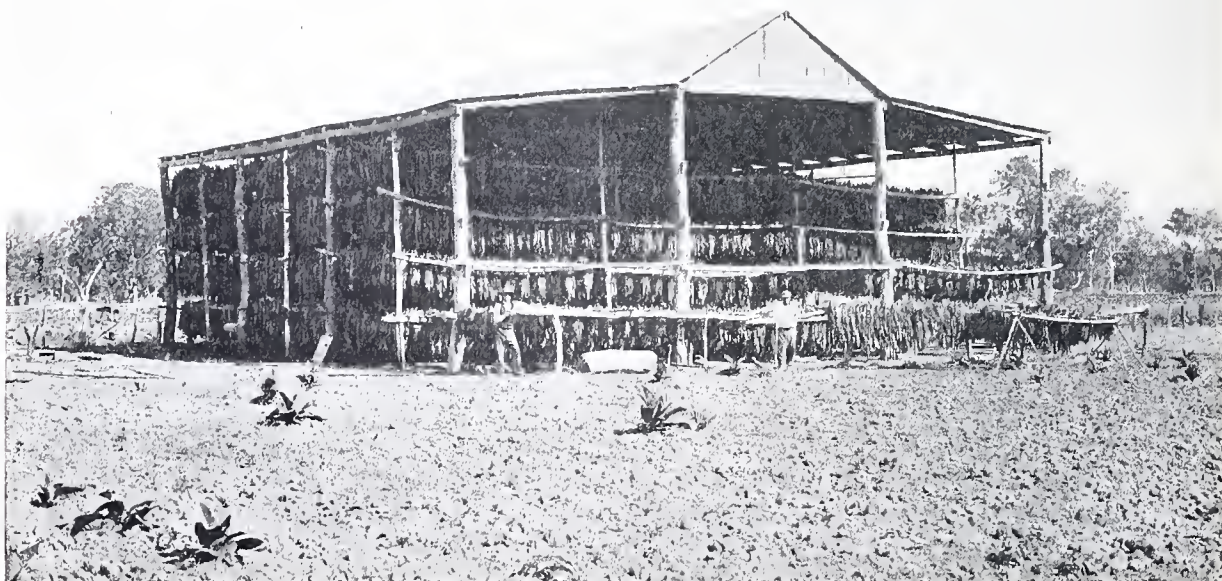
housing of stock in winter, and the cultivation of roots and cereals to supplement the scanty pasture of the cold months. At Glen Innes there is another Experiment Farm, established to help the farmers of this district to solve the problems of their stiff black soil and their rigorous climate. The Great Northern railway reaches a height of nearly 4,500 feet at Ben Lomond—a name which, with many others like Aberdeen, Stonehenge, Glencoe, and Dundee, brings back memories of the dear old land that is never forgotten mid the charms of the new.

The Northern Tableland falls away rapidly towards the coast, and on **The Dorrigo.** this eastern slope there are many rich tracts of country still awaiting development by the opening of roads to seaports. Among these is the Dorrigo, situate about midway between Sydney and Brisbane, comprising 96,000 acres, falling from 3,100 feet above the sea to 1,600 feet, covered with luxuriant vegetation, rich and fertile, well-watered and temperate in climate. This fine area of Crown lands is now made accessible by good roads, going upwards 65 miles to Armidale, and downwards 19 miles to Coff's Harbour and the Bellinger River; part has been subdivided into 142 areas, ranging from 140 to 320 acres, suitable for dairying and mixed farming, and will be made available for purchase under the provisions of the new tenure—Conditional Purchase Lease—before the close of this year (1906). The average area of the 3,959 holdings on the Northern Tableland is 594 acres.

THE NORTH-WESTERN SLOPE.

The slope of the Northern Tableland towards the west is a gradual one, forming the watershed of the McIntyre, Gwydir, and Namoi Rivers, which go to make the Darling, the river which waters the great western plains, and passes Brewarrina, Bourke, Wilcannia, Menindie, and Wentworth, where it unites with the Murray. The part of the north-western slope which extends to Moree, Walgett, Narrabri, Gunnedah, and Coonamble, embraces a very important section of the State, which gradually falls in elevation from 1,500 to 600 feet, has a rainfall similarly diminishing from 30 to 16 inches, and marks the transition between the farming districts of the tableland and the purely pastoral settlements of the Western Plains. The possibilities of irrigation by artesian water are being proved by experiment farms at several Government bores at Moree, Walgett, Pera, Native Dog, Barrington, Emmongia, and Belalie, and on a larger or smaller scale at several hundred private bores. Though the amount of available artesian water must necessarily be limited, it has already been proved to be ample to water the greater part of the western country for sheep, and to make hundreds of oases, varying in area from 50 to 600 acres, where such supplies of fodder can be grown as will greatly diminish the terrors of our recurring droughts.

The average area of the 3,718 holdings on the North-western Slope is 1,137 acres. The agriculturist is fast encroaching on the pastoralist in this part of the country, and as the large areas now held from the Crown, under lease, gradually revert to the State, they will certainly be demanded by the coming generation for closer settlement, and the area of 235,114 acres now cultivated out of 4,228,792 alienated, will then be largely increased.



TOBACCO SHED NEAR TAMWORTH.

THE WESTERN PLAINS.

The Western Plains embrace a large part of the State which is very even in surface, slopes gradually from 500 feet to the level of the sea, has a very rich soil needing only water to develop its fertility, but enjoys a low rainfall—ranging from 5 to 16 inches per annum. In the north-western part there are 965 holdings, with an average area of 2,364 acres; in the central part of these Western Plains the number of holdings is 2,034, and the average size 1,865 acres; while in the Riverina, in the south-west, the average of the 4,124 holdings is 2,933 acres—which greater figure is not to be taken as an indication that the climate, soil, and other circumstances of this district demand a larger “living area,” but merely that the provisions of the Crown Lands Act of 1861 were more freely utilised here than elsewhere, and the joint operations of pastoralists and various banking corporations, resulted in the alienation of immense areas of the best pastoral land in the State, and in the aggregation of many vast estates, larger than European principalities. Natural evolution, hastened by man’s impatience, will cure this evil, and we shall soon have, in this splendid grazing country, more than one landholder to each $4\frac{1}{2}$ square miles of territory. When statesmanship shall have solved the problems involved, as it surely will in the near future, there will be plenty of room for new settlers and immigrants on the tablelands and western slopes. For the present, closer settlement must proceed westwards from the coast, more in obedience to natural laws than to political theories and economic principles.



VIEW OF OPEN CUT FACE, ENSILAGE STACK.

USE OF FERTILISERS.

One of the most encouraging signs in the consideration of the future possibilities of agriculture and fruit-growing in New South Wales is the increasing use of fertilisers. There are farms in the oldest settled districts which have been cropped for eighty years without the



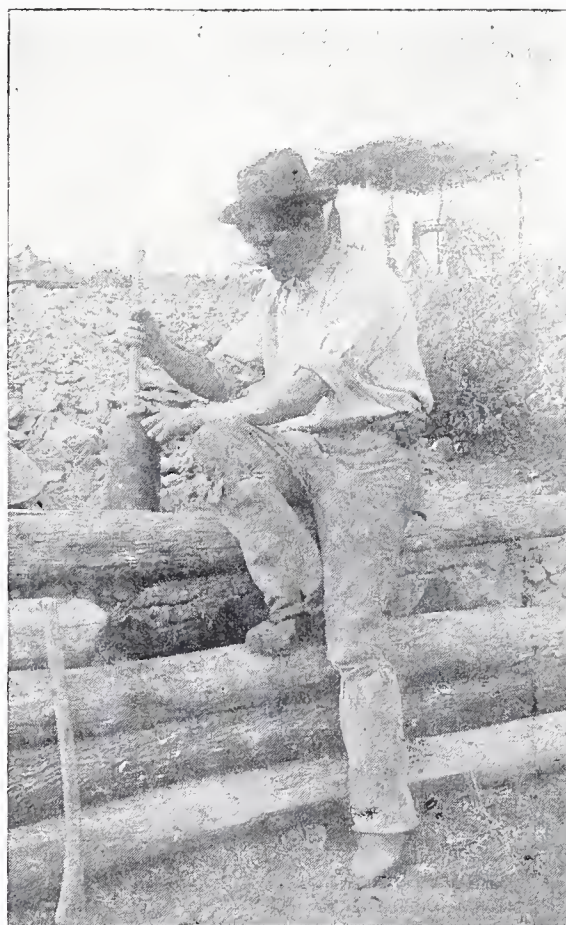
TEACHER'S RESIDENCE, COUNTRY SCHOOL.

assistance of any manure; many parts of the Metropolitan area and the South Coast were cropped for wheat and other cereal crops for twenty years, till the rust made them unprofitable forty years ago, and they have been used for grazing ever since, without any top-dressing, or even spreading of the supplies kindly deposited by beneficent cattle. Corn-stalks, husks, cobs, and other waste vegetable matter have been generally burnt; on many wheat farms the straw has been burnt;

the droppings of the milking yards and bails were seldom conserved and utilised, more often were washed down into the nearest creek, to give a delicate flavour to the cows' water supply; the wood ashes and waste matter of the household, fowl-houses, and piggeries were seldom systematically used, more often allowed to become a menace to the health and comfort of the family; green manuring was unknown; and generally the prosperity of farming made men thriftless and indifferent to the problem of impoverished soil which their children would have to face. The bone and sinew of the country, in the form of bone-dust and dried blood, were being exported to New Zealand and other countries. The waste products of the cities were taken out to sea, or otherwise criminally wasted. The sulphate of ammonia of the gasworks was all sent to Mauritius to grow sugar for our own markets; thousands of cattle and sheep were sent to England. We were exporting thousands of tons of our natural fertility every year, and importing oats, barley, potatoes, cheese, sugar, and similar things produced in other States by the aid of our own manures. The inevitable results slowly carried conviction to even the dullest comprehension. There were always a few voices crying in the wilderness, and men were led to think what they could do to restore the old fertility of their farms, their orchards, and their pastures.

The creation of a Department of Agriculture, in 1890, gave a great impetus to the work of educating the old school of farmers as to the use of fertilisers. The Agricultural College and Experimental Farms have done much to teach the young generation, and to teach by precept and example, what can be done by the judicious use of fertilisers to improve the profits of working old farms. The well-planned experiments of Professor Lowrie, of Roseworthy College, in

South Australia, demonstrated the value of superphosphate alone—even in small dressings—to increase the wheat crop, and the result has been a wonderful appreciation in the price of wheat land in that State. Potash manures were introduced from Germany, no natural supplies having been yet found in Australia. The bone-ash of the sugar refinery was made into superphosphate, and mixed with sulphate of ammonia and potash salts in varying proportions, to suit the requirements of different crops, as indicated by the agricultural chemist. The blood and offal of the abattoirs, which had for many years been wasted by being sent out to the ocean at great expense, are now dried and made into a manure, gladly bought at £6 a ton. Thousands of tons of bone-dust and superphosphate, formerly sent to New Zealand, to enable the more advanced farmers there to adopt an intense form of cultivation, are now gladly used on our own farms and orchards. The limestone quarries of the Western district are now turning out large quantities of agricultural lime, to sweeten sour soils, and increase the fertility of many in which that substance is deficient. The waste lime, hair and scrapings of tanneries, which used to accumulate in great heaps of offensiveness, are now eagerly bought by neighbouring gardeners. Wood ashes are not allowed to go to waste. Their value has been revealed by the chemist's analyses, varying from 4s. 3d. per ton in the case of the ashes of spotted gum, to 10s. for those of ironbark and box, 25s. 6d. for those of red gum, and 31s. 9d. for those of bloodwood. The advantages of green manuring and of catch crops are being better understood, and cow peas, clovers, tares, field peas, and lucerne are all used to enrich the soil, by catching and fixing the nitrogen of the air. Manure heaps and compost heaps are not yet to be found on every farm, but they are not such a curiosity as they were twenty years ago. Thomas' Phosphate is imported in hundreds of tons, as a by-product, from the steel furnaces of the old world, and is sold at 90s. a ton. Kainit is imported from Stassfurt, and sold at 85s. per ton; sulphate of potash, highly valued for orchards and vegetable gardens, at £14 a ton. Bone-dust, made of the bones, blood, and offal of the cattle and sheep slaughtered for our export trade, very finely ground and dried, is a manure highly appreciated and widely used, being sold at prices dictated by the chemical analyses, and varying from 90s. to 120s.



DOLLYING GOLD.

per ton. Gypsum, which is found in large beds in several parts of Australia, is growing in favour as a constituent of fertilisers for leguminous crops. Nitrate of soda is little used, not being able to compete in price with the richer sulphate of ammonia, locally made. The interests of the agriculturist in regard to manures are protected by legislation, and the trade has been regulated in such a way as to ensure an honest article being procurable at a reasonable price.

The microscopic life in soils, the biological action which influences so much the fertility of land, the conditions which favour growth and development of bacteria, whether friendly or hostile,—those that act with the leguminous plants in capturing the riches of the air, or those that play such a part in fermenting our wines, in maturing our butter, and in ripening our cheese—all these are becoming known by slow degrees to our young Australian farmers, and the consequence is a hopeful confidence in the great potentialities of our vast area of arable land, and the possibilities of agriculture as a calling alike for our own sons, and for the immigrants whom we are now inviting to come out and join us in developing and working out the destinies of this highly favoured land.



CAMP FOR THE NIGHT.

THE AGRICULTURAL MAP.

The agricultural map should be studied in conjunction with Chapter XI. The part coloured green, which practically embraces the whole of the Coast District, with the eastern slopes of the range of mountains extending throughout the whole of the State, is eminently adapted for dairying. The northern counties of Rous, Richmond, and Clarence are suited by climate and rainfall for the sugar-cane, which has been largely cultivated for the past twenty years, but is gradually giving place to dairying. In the southern districts, maize, millets, sorghums, oats, rye, potatoes, and other farm crops are raised, and on the soil of second-rate quality in the undulating country nearer the foothills, considerable attention is given to fruit-growing—pine-apples, bananas, oranges, lemons, grapes, peaches, apricots, plums, passion-fruit, and different berries. On the gentle slopes of the central coast and along the Hunter Valley, light wines of high quality are made. The alluvial soil of all these coastal rivers is well adapted for the growing of lucerne, maize, and other fodder crops, and the adjoining higher ground furnishes ideal grazing country for dairy cattle. There are, of course, some stretches of poor country, even in this highly favoured part of the State, where sandstone and shales give rise to inferior soils; but these are generally covered with good timber, and when partially cleared, yield fair grazing for dry cattle. The greater part of the green area is capable of enormous expansion in dairying. The rainfall of this district is generally bounteous, varying between 28 inches and 78 inches per annum.

The part coloured red is devoted to general farming, with the grazing of sheep, cattle, and horses. Occasional small districts, shown by green splashes, are peculiarly suited for dairying, owing to special climatic conditions; on the other hand, there are here and there patches of rough granite country and poor sandstone which are not yet deemed worth attention. The growing of English fruits, especially cherries, apples, pears, plums, figs, apricots, and berries, is a profitable industry in many places where the railway makes good markets easily accessible, and there is room to extend orchards an hundredfold, when the demand shall warrant such extension. The rainfall of this district varies between 25 inches and 54 inches.

The part coloured yellow has been proved to be admirably adapted for the cultivation of wheat, which is always accompanied by the grazing of sheep. In many parts, grapes, olives,



JERSEY HEIFERS.

stone fruits, figs, and walnuts can be grown, and the dry summers make it possible to produce excellent raisins and other dried fruits. Much of this area, more especially the Riverina District, between the Murrumbidgee and the Murray Rivers, is specially suited for the production of rich, sweet wines. There are isolated patches of country outside of this area, indicated by yellow spots, in which wheat has been successfully grown, but, generally speaking, the rainfall of that part of the State, which is uncoloured, is too low for successful farming under present conditions. In a few places where the rainfall is below 20 inches, but most of it comes between April and November—the right time for wheat-growing—this cereal has been profitably cultivated. A large part of this tract of country will be given over to intense cultivation, when the national scheme of irrigation, which is now being formulated by the Government, shall have been carried into effect.

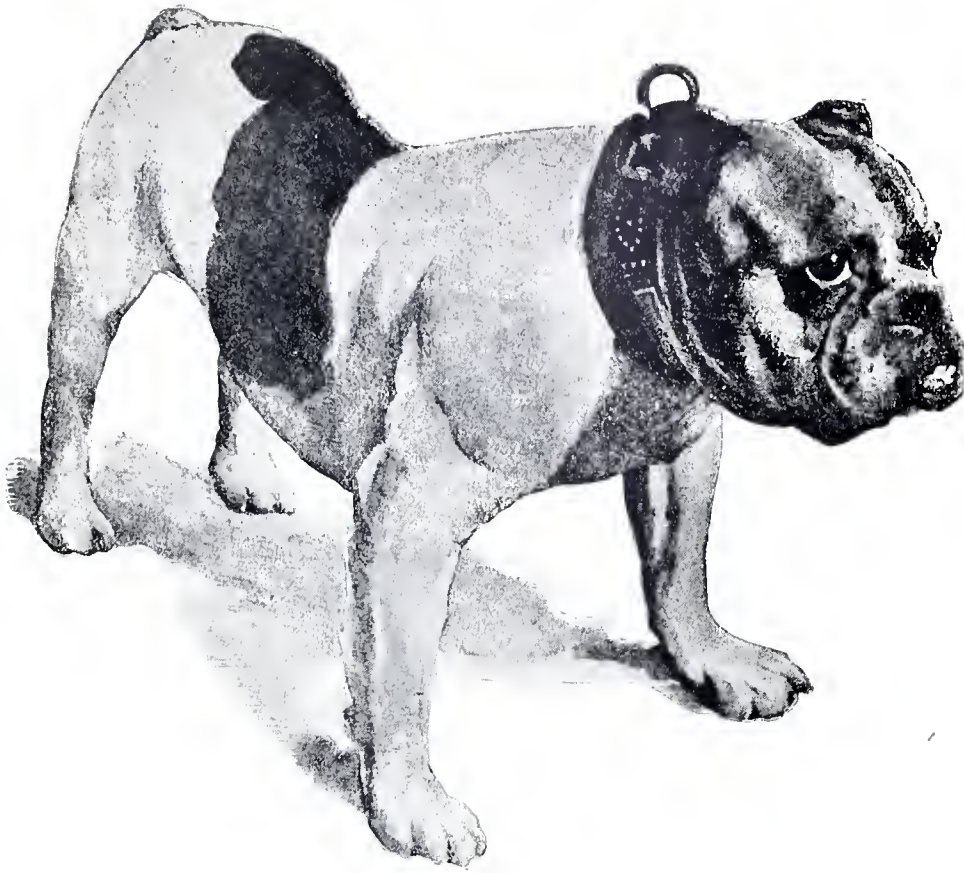
The greater portion of the Western Plains, which are uncoloured, is held in extensive leasehold areas, and is entirely given over to stock-raising, except in the comparatively small patches of cultivation round the numerous artesian bores in the north-western part, and along the irrigation canals of the Riverina, in the south-west. The southern limit of the very extensive water bearing basin of the western part of the State is indicated by the boundary line coloured blue. The rainfall of this part of the State varies between 8 inches in the extreme west and 20 inches on the fringe of the great wheat belt.



A TIMBER-GETTER'S HUT.



PLOUGHING WITH TRACTION ENGINE GOONDOO GOONDOO, NEAR TAMWORTH.



KEEP YOUR EYE ON



THE BEST IN AUSTRALIA.

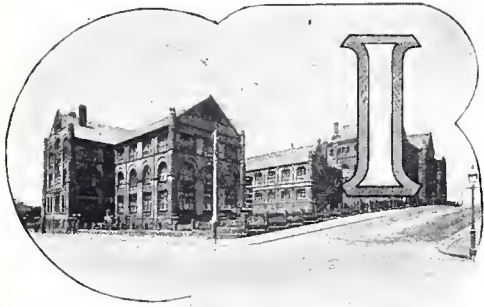
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 **SYDNEY.**

General Agriculture.

Its History and Development—Statistical Record of Progress—Yields—Prospects.



It is only within recent years that New South Wales has achieved prominence as an agricultural country. It is but yesterday that the State began to export wheat—1897 being the first year that the production exceeded the consumption. But the period of inactivity and agricultural apathy has ended, and now every year sees a great advance in the area put under crops of various kinds, and great strides in productivity. But yet only a beginning has been

made. It has been estimated that within the State there are 20,000,000 acres of land suitable in soil and situated in districts possessing all the necessary climatic requirements for growing wheat; and up to date the total area under this profitable cereal has not touched the 2,000,000 acres mark. And a similar story could be told with regard to all other agricultural products. With a vast field for expansion, highly favourable natural conditions, and illimitable markets brought to our very doors by swift modern steamships and low freights, the future is all to make. New South Wales must, within a very few years, become one of the greatest agricultural countries in the world. Already her wheat export averages over 9,000,000 bushels a year, and is growing rapidly; while in the British markets in 1904 Australian wheat had a higher value than that from any other country, being quoted at 31s. 4d. per quarter, or 1s. 3d. per quarter higher than the Argentine grain, 6d. higher than Canadian, and 3s. higher than British. Usually it is about 2s. per quarter higher than the price of British wheat.

The history of agriculture in New South Wales is a record of a long continued neglect to take advantage of the bountiful opportunities which nature has afforded the farmer in this State. Still it is an interesting story, as all stories are which take us back to those days at the close of the eighteenth century when a handful of intrepid Englishmen were, 16,000 miles from home, battling in an unknown and apparently inhospitable country with the greatest colonising project ever launched.

Australian agriculture had its first start in the endeavours of the first colonists to stave off starvation. Soon after Captain Phillip's landing in 1788 he selected the shores of what is now

called Farm Cove for the first Government farm. To-day the site is occupied by, perhaps, the most beautifully-situated botanical garden in the world. The seeds and trees first planted included coffee, cocoa, cotton, banana, oranges, guava, tamarine, prickly-pear, eugenia, ipecacuanha, the fig-tree, bamboo, sugar-cane, vines, quince, apple, pear, strawberry, oak, and myrtle. For a long time, however, the little settlement was dependent for its food supply on rations brought from England, and often the colonists were put to sore straits. Failing to obtain any satisfactory results from the land about Sydney, a Government farm was attempted at a place which was first called Rose Hill and afterwards Parramatta. But just prior to this—on 25th February, 1790, James Ruse, the first private settler of whom we hear as having attempted agriculture, had begun farming operations at Parramatta. And it was no doubt the success of Ruse which induced the Governor to try the land in that neighbourhood. The following account of this man's work has been left to us by Captain Tench :—"I next visited a humble adventurer who is trying his fortune here. When his term of punishment expired in August, 1789, he claimed his freedom, and was permitted by the Governor, on promising to settle in the country, to take, in December following, an uncleared piece of ground, with an assurance that if he would cultivate it, it should not be taken from him. Some assistance was given him to fell the timber, and accordingly he began. His present account to me was as follows :— 'I was bred a husbandman, near Launceston, in Cornwall. I cleared my land as well as I could with the help afforded me. The exact limit of what ground I am to have I do not yet know ; but a certain direction has been pointed out to me in which I may proceed as fast as I can cultivate. I have now an acre and a half in bearded wheat, half an acre in maize, and a small kitchen garden. On my wheat land I sowed 3 bushels of seed, the produce of this country, broadcast. I expect to reap about 12 or 13 bushels. I know nothing of the cultivation of maize, and cannot, therefore, guess so well of what I am likely to gather.' "



IRRIGATING CHANNEL ON A WESTERN STATION.

It is recorded that in March, 1791, Ruse expressed his desire to relinquish his claim to any further support from the Government, declaring that he was able to provide for himself out of the produce of his own farm, which had been granted to him on 22nd February, 1790. This was the first land grant made in Australia. Ruse afterwards moved to the Hawkesbury,

where he obtained another grant. He was one of the first settlers in that district. He died in 1837, and was buried at Campbelltown, where his tombstone is even at the present day in a well-preserved state.

The success achieved by Ruse caused others to follow his example, and, encouraged by the active sympathy of the Governor and officials, a free grant of 100 acres being given to non-commissioned officers of the Marines, and 50 acres to the men who would till the soil.



A GOOD VIEW OF THE DISC PLOUGH AT WORK.

there was soon a little collection of settlers in the Hawkesbury district engaged in agriculture. In 1793 Captain John Macarthur took up a farm at Parramatta, and there laid the foundation of the pastoral industry. During Governor Macquarie's term of office, 1810-21, the Blue Mountains were crossed by the pastoralist and agriculturist, and from that time the agriculture industry began steadily to expand. The Australian Agricultural Company was floated in England in 1824; but this Company devoted its attention mainly to sheep-breeding. The agricultural movement in various parts of the country, however, gradually spread, until in 1860 there were, including grass-sown lands, 260,798 acres under some form of cultivation.

The area of the State absolutely unfit for cultivation of any sort has been roughly estimated to be less than 5,000,000 acres. The true farming portion of the State comprises the whole of the Eastern Division with the exception of the rugged country in the mountain chains, and most of the Central Division, and it has been proved by observations extending over a series of years that in this portion there are about 50,000,000 acres where the rainfall is sufficiently plentiful and regular, in eight years out of ten, for the successful pursuit of agriculture in all its branches. The progress made from 1860 to 1891, the first thirty-one years after the separation of Queensland from New South Wales, was very slow. In 1860, the area under crops combined with the area in cultivation of any sort, including grass lands, was, as stated, 260,798 acres, a percentage per inhabitant of 0·7 acres. The area grew slowly, until, in 1890, there were 852,704 acres under crops and 388,715 under other forms of cultivation, including grass

lands. By 1894 the grown to 1,325,964 and other cultivated. Since that date the tivated area has 100 per cent., while crops exclusively the also increased by 100 increase in any one when it amounted to 20 per cent. A better agriculture, however,



area under crops had acres and the grassed area to 362,578 acres. increase in the eul- amounted to nearly taking the land under cultivated area has per cent. The largest year was in 1898, 382,671 acres, or over idea of the progress of is gained by compar-

ing the area under crop with the population. Up to 1893, less than 1 acre per head was cultivated; between 1893 and 1898 the proportion doubled, but since 1898, owing to the comparatively rapid growth of the population, it has remained stationary. There is every indication now that the next few years will see a big spread in agriculture.

In the great increase of area under cultivation that has taken place during the last ten years, the western slopes account for nearly half the total advance, or 648,167 acres, and Riverina increased by 351,000 acres. The Central western slope and Central western plain were not far behind Riverina; but on the coast very little progress was made, only 12,905 additional acres being brought under cultivation. The reason of this is that the bulk of the new ground ploughed was put under wheat, which is not a suitable crop for the rich lands of the coastal areas. The extension of cultivation has been largely contributed to by the taking up of wheat-growing on large estates formerly devoted almost exclusively to grazing, and also by the adoption of the system of farming on shares. During the year 1904 the area cultivated on shares was 340,015 acres, of which nearly one-half—165,993 acres—was in the Riverina Division. Taking the State as a whole at the end of 1904, of the 198,848,000 acres which comprise its area,

167,408,464 acres were under occupation, 2,672,973 acres under crops, and 607,997 acres under permanent sown grasses. The proportion of the State under crops to the whole area was 1·3 per cent., and to the area under occupation 1·6 per cent. Some of the best lands for producing cereals are in the hands of the pastoralists; whilst farmers have not always settled on the kind of country best suited for the cultivation of their crops. This fact tends to reduce greatly the average annual yield.

By far the largest proportion of the area under crops is devoted to the cultivation of wheat, which, as is elsewhere pointed out in this volume, **Wheat the biggest Factor.** can be produced more cheaply in New South Wales than in any other country in the world. In 1904 wheat took up 66·5 per cent. of the total cultivation. Hay was responsible for 16·3 per cent.; after which came maize, 7·2 per cent.; green food, 3·3 per cent.; and orchards and market gardens, 2·1 per cent. In acres the crops ran as follows:—Wheat, 1,775,955 acres; hay, 435,704 acres; maize, 193,614 acres; green food, 87,718 acres; oats, 40,471 acres; barley, 14,930 acres; potatoes, 23,855 acres; sugar-cane, 21,525 acres; vines, 8,840 acres; orchards, 47,340 acres; market gardens, 8,827 acres; and other crops, 14,194 acres. The area devoted to wheat has always exceeded that given to other crops. From the year 1880, the proportion under wheat has steadily increased, until it now stands at two-thirds of the whole area under cultivation. During the same time the proportion under maize has decreased from 20 per cent. to 7 per cent., and hay from 21 to 16 per cent. The other crops have not varied much, except that the tendency has been for the proportion to decrease.



BAGS OF WHEAT AT COUNTRY STATION.

The value of the agricultural production is largely dependent upon wheat and hay, the returns from which in 1904 totalled 63·1 per cent. of the sum realised—£5,413,710. The maize crop in the same year was worth £557,000; barley, £39,485; oats, £67,985; potatoes, £251,940; sugar-cane, £180,870; grapes, £54,750; wine and brandy, £76,920; oranges and lemons, £82,480; orchards, £162,670; market gardens, £225,400; and other crops, £125,015. The



CLEARING OPERATIONS: TREE BEING PULLED DOWN BY TACKLE.

value per acre of the production in 1903 was £3 5s. 9d., and in 1904 £2 0s. 6d. The highest value received since 1880 was in 1881, when the return was £7 4s. 5d. per acre. A decrease in prices, and not want of productiveness, was responsible for the decline

in value since 1881. The fall in prices, especially of wheat, was very rapid down to 1895; for the next three years there was a very material increase; in 1899 they fell again to the 1895 level, but in 1901 there was a more or less general increase; while towards the close of 1902, and almost up to the close of 1903, the effects of the adverse season were acutely felt, and prices rose to double those of the previous year. At the end of 1903, when the heavy crops began to come in, prices again fell, but they were, nevertheless, higher than the 1901 level. In 1904 prices increased slightly, and were generally higher than at the close of 1903.

The advance which New South Wales is now making in wheat cultivation is in every way gratifying. It will be seen from a study of the Government Statistician's figures that the tardiness of development was not due to the lack of capacity to produce a payable average. Taking the last thirty years, the annual average yield has been 10·85 bushels to the acre. The highest averages recorded have been 17·51 in 1903 and 17·37 in 1886. The lowest was 1·24 bushels in the disastrous year of 1902. During the whole period there were only six seasons when the yield fell below 10 bushels per acre, namely: 1888 with 4·75; 1895 with 8·71; 1898 with 7·03; 1899 with 9·54; 1902 with 1·24; and 1904 with 9·27. Five out of the six cases occurred within the last ten years, which were, perhaps, the driest the State has ever seen. So that here the story of the wheat yield is heard in its very worst aspect. It can safely be said that

**A gratifying
Advance.**

from equal qualities of soil a better yield is now obtained than that realised twenty years ago ; a result due largely to improved farming, the use of fertilisers, and more economical harvesting appliances, and to the fact that rust, smut, and other forms of disease in wheat have been less frequent and less general in recent years. And from the results of wheat-breeding experiments conducted by the late Mr. Wm. Farrer for the Agricultural Department, it seems likely that even more freedom from disease and generally better results will be obtained in the future. The general yield of the State is now adversely affected by the fact that in a great many instances farmers are cultivating land in unsuitable districts. In favoured localities in good seasons splendid returns are got ; and the general average is by no means a criterion of what the scientific farmer may expect under favourable conditions. Experts state that with the expenditure of a comparatively small sum on manures and effective machinery and implements, and with the combination of stock with cultivation, the production from the present area could be increased by from 50 to 100 per cent. That the possibilities of New South Wales are great must be admitted, seeing that if only a quarter of the wheat area were cultivated on more scientific lines there would be a probable surplus of over 50,000,000 bushels available for export after satisfying all the demands of the local population.

With reference to the cost of growing and exporting wheat, a calculation recently made shows that taking all factors into account, such as the proportions of lands variously prepared and sown, the proportion of crops harvested by different methods, average railway and other freights, but excluding interest on capital, rents, &c., the cost of landing wheat in Sydney may be set down at 1s. 9½d. per bushel with a 10-bushel crop. In the near future, however, with the increased use of improved machinery, the average cost is likely to be much reduced. On farms of large areas where the disc plough and drill are used the



CLEARING OPERATIONS: TREES AS PULLED DOWN BY TACKLE.

cost per acre of raising a 10-bushel crop may be taken as about 16s. All farmers are interested in export charges, and taking the wheat from the point of production on a farm 300 miles from

Sydney, the cost of transporting and selling it in London would be about 1s. 3d. per bushel. This compares very favourably with the cost of sending wheat from the inland districts of Canada to London. The average rates for wheat per bushel ruling in the Sydney market in



A GOOD GROWTH OF PASPALUM.

February for the eleven years 1894 to 1905 were as follows :—1894, 2s. 11d. ; 1895, 2s. 7d. ; 1896, 4s. 4½d. ; 1897, 4s. 8d. ; 1898, 4s. ; 1899, 2s. 7½d. ; 1900, 2s. 9d. ; 1901, 2s. 7d. ; 1902, 3s. 2d. ; 1904, 3s. 0½d. ; 1905, 3s. 4½d. There were no quotations in 1903, owing to the failure of that year's crop.

Of the crops other than wheat, maize ranks next in importance. During
Maize. the last fifteen years, the area under maize has practically remained at a standstill, being only 2,000 acres more in 1904 than 1890. The cultivation of maize is carried on chiefly in the valleys of the coastal rivers, where both soil and climate are peculiarly adapted for its growth. On the tableland also its cultivation is attended with good results. In 1904 193,614 acres were cultivated for maize, the total yield of which was 4,951,132 bushels, an average of 25·6 bushels to the acre. The average maize yield over twenty years ended 1904 was 28·5 bushels. Some of the coastal districts are peculiarly favourable to the cultivation of maize, and here yields of 80 to 100 bushels per acre are by no means uncommon. Up to 1890 the State produced more maize than could be locally consumed, and exported a small quantity to her southern neighbours, but every year since, with one exception, there has been a net import ranging from 9,883 bushels in 1898 to 1,476,704 bushels in 1903. Practically nothing has been done to develop an oversea export trade, although maize is apparently growing

in favour in the United Kingdom and Europe. The great profits to be made from dairying on the land that is suited for maize-growing has undoubtedly led to the neglect of this cereal, but the development of pig-raising and bacon-curing as adjuncts to dairying may lead to an increased demand. The maize crop is a valuable one, and doubtless additional attention will be paid to it in the future.

Oats is another cereal the cultivation of which has been considerably neglected in New South Wales. In fact the advance in agriculture to be noted since 1894 has been almost entirely confined to wheat. There is, consequently, a great possibility of development along other lines. The deficiency between the production of oats and the consumption is very considerable. The elevated districts of Monaro, Argyle, Bathurst, and New England contain large areas of land where the cultivation of oats could be carried on with remunerative results. Although the cereal is a product of cold climates, it is cultivated to some extent in Riverina and the South-western Slopes. In 1904 the area under crop for grain was 40,471 acres, which produced 652,646 bushels, or 16.1 bushels per acre. The Northern tableland gave the best average with 20.3 bushels per acre. In 1903 1,388,710 bushels of oats were imported, and in 1904 the importations amounted to 192,806 bushels.

Barley is an important crop that, although produced at present in comparatively small quantities, will yet come to the front as one of the prominent features of our agricultural industry. It has been demonstrated that barley, grown in several parts of the State where the essential conditions of sweet, well-drained soil exist, is particularly suited for malting, and an effort has been made by brewers during the last few years to induce a more extensive cultivation in those districts which are best fitted for the production of the malting varieties. Farmers are notoriously conservative, and it is well known that they prefer to jog along on lines familiar to them, producing crops they know all about. Barley is novel to Australian farmers, and they are disinclined to put it in, disregarding the profits that await the man who successfully cultivates it. One northern brewer, after vainly endeavouring to induce the farmers in his locality to go in for barley cultivation, took up land and put in ex-



A FLOCK OF CROSS-BRED LINCOLN-MERINO EWES.

tensive areas on his own account, with the happiest results. During 1904 the area under barley for grain was 14,930 acres, which yielded 266,781 bushels, or 17.9 per acre. Of the total area, 11,272 acres were reaped for malting barley, and 3,658 for other varieties. The

greater part of the cereal is grown in the Tamworth district, on the North-western Slope, the area in the district being 11,235 acres, the bulk of which was for malting barley. The average yield of the barley crops for the last ten years was 15·6 bushels per acre. At present the local demand for barley is largely met by importations from New Zealand. In 1904 the imports were barley, 123,680 bushels; malt, 129,647 bushels.

Hay. Hay is an important factor in the agricultural production, in addition to the areas threshed for grain, considerable quantities of wheat, oats, barley, and lucerne being grown for the purpose of being converted into hay for farm stock, or chaff for town requirements. About 65 per cent. of the total area under cultivation for hay is taken up by the area under wheaten hay. Up to 1894 the cultivation of wheat for hay increased in a much greater ratio than that for grain. During the last eight years, when the great expansion in wheat cultivation has taken place, there has not been much difference in the ratio of increase for grain and for hay. Oaten hay is grown in parts of the State where the climate is not suitable for maturing the grain, but, in any case, the price obtained for the hay is usually so profitable that the cultivation of oats for threshing is neglected. The area under barley for hay is not large. Lucerne hay is always in good demand, and sells readily at remunerative prices. It is grown chiefly on the river flats of the Hunter and Manning districts, the central tableland, and the North-western Slope. It gives the best return of all the crops grown for hay; the average yield during the last ten years having been 2·2 tons per acre, as against 1·1 tons of barley, 1 ton of oaten, and ·8 tons of wheaten hay. In favourable districts, where it has received proper attention, it grows so rapidly that as many as eight crops in the course of a year have been reaped, each averaging about 1 ton per acre. Hay is still imported to New South Wales, so that there is plenty of room for an extension of its cultivation.



A PASS IN THE SNOWY MOUNTAINS.

Minor Crops and Fodder. Rye and broom millet are minor crops which are as yet little cultivated, but before which there are excellent prospects. In 1904 3,511 acres were under rye. The return from the fibre alone of the broom millet crop in 1904 amounted to £29,000, the average return being £12 18s. per ton. In 1904 the area under broom millet was 3,906 acres, from which 22,493 cwt. of fibre and 15,916 bushels of grain were obtained, the averages being 5·8 cwt. and 4·1 bushels respectively per acre. The greater portion of the crop is grown in the Hunter River Valley, and in the valleys of the northern coastal rivers. Crops of maize, oats, barley, sorghum, millet, rye, and other cereals, as well as lucerne, rape, and grasses, are grown annually for green food, and this cultivation is extending owing to the expansion of the dairying industry. Artificial grasses have received more or less attention for many years, but it is largely in the north and

south coastal districts, carried on, that the grasses has been for years ago the area artificially - sown grasses whereas in 1904 it had acres. Although lucerne Hunter River Flats and cultivation as green throughout the country the banks of the rivers the Dividing Range. In the pastoral districts attempts to cultivate lucerne have met with marked success. 75 sheep per acre were grown on land irrigated Lachlan River while at 1904 there were 39,757 acres of lucerne, and 42,247 acres of lucerne value of ensilage as generally acknowledged method of preserving lucerne extensively practised as the better education of farmers, the system is more general use. Not many places in the

growth, the cultivation of the potato has progressed very slowly; and in 1904 73,044 tons were imported. In that year 10,075 acres were cultivated in New South Wales, chiefly round Bathurst. The average yield of potatoes for the past ten years was 2.2 tons per acre.



IN A SORGHUM PATCH.

where dairy farming is practice of sowing lucerne. Twenty-five years under permanent artifice was about 80,000 acres, increased to 608,000 acres lucerne thrives best in the similar districts, its food is extending country, principally along the western slope of the Dividing Range. In the far western pastures have been made to irrigate, and these with success. As many as 75 sheep per acre have been fed for four or five seasons with lucerne with water from the its lowest level. During the winter months acres grown for green lucerne for hay. Although the fodder for cattle is well known, this valuable green food is not so it should be. But with farmers and pastoralists gradually coming into the State well suited for its

Sugar-cane. Sugar-cane is grown to a considerable extent in the Northern Rivers districts where it thrives. Its cultivation is confined chiefly to the valleys of the

Richmond, Clarence, and Tweed Rivers. From a small start on the Hastings River in 1822, the area under cane has gradually and steadily increased. It reached the highest point, 32,927 acres, in 1895. After that date great developments in the dairying industry withdrew land from sugar-planting, and the area under cane steadily declined for five years, until in 1900 there were only 22,114 acres under cultivation. Since 1900 the area has remained practically stationary at a little over 20,000 acres. The area of cane cut during 1904 was 9,772

acres, with a total yield of 199,640 tons, or an average of 20·4 tons per acre. During the last ten years the average was 19·1 tons per acre, and during the last five years 20·6 tons per acre. Sugar manufacturers invariably purchase the year's crop of cane standing, and cut it at their own cost. From plantations in full bearing the average weight of the cane varies from 25 to 32 tons, while the price paid varies from 8s. to 13s. per ton. Until comparatively recently the field work on the sugar plantations of New South Wales was performed entirely by white labour, and even in 1901, when the Federal legislation in connection with the sugar industry was passed, the number of blacks employed was not large. At the census of 1901 there were 239 Hindoos and 291 Pacific Islanders working on the sugar plantations. The duty on imported sugar is £6 per ton; while the excise duty is fixed at £3 per ton; but a bounty of from 4s. to 5s. per ton of cane, calculated according to its sugar contents—equal to £2 per ton of sugar—is allowed on Australian sugar grown by white labour, the bounty being paid to the grower. The employment of white against black labour is thus protected to the extent of £2 per ton of sugar, equal to about 4s. 5d. per ton of cane. The cost of growing sugar-cane may be set down at from 2s. 11d. to 3s. 5d. per ton of cane according as black or white labour is employed. About 10 per cent. of the sugar grown is cultivated by black labour.

Throughout the whole of New South Wales, and more especially in **Share-farming.** the district between the Lachlan and the Murray, the owners of large estates are coming to realise more and more the possibilities which exist in the direction of increasing the productiveness of their land, by bringing under cultivation areas hitherto given over to the raising of the merino. The system of agriculture which is sometimes adopted, in the first stage of development, for this purpose is "share-farming,"



WHITE LEGHORNS.

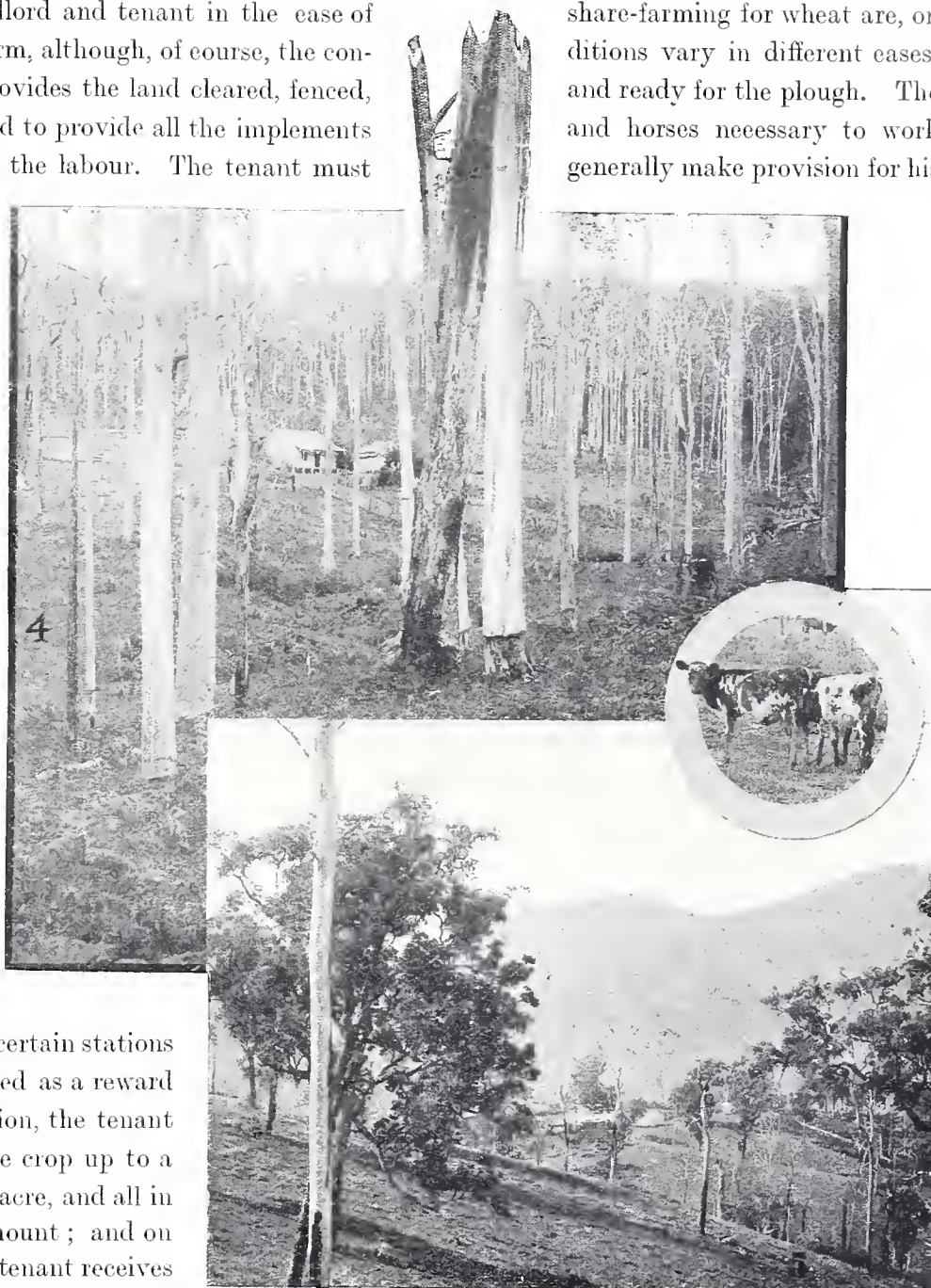
and to take a farm "on the shares" for a year or two will probably in many cases prove the most profitable course for an immigrant possessed of good agricultural experience but small capital, who has gained some acquaintance with local conditions in New South Wales, and wishes to perfect his knowledge of Australian methods of cultivation, and at the same time to

add to the capital at his disposal, with a view to purchasing a farm for himself. To the immigrant accustomed to the cultivation of grain crops, the large private estates situated in the Riverina and other parts of the wheat belt offer opportunities for wheat-farming on shares. The terms as between landlord and tenant in the case of the whole, uniform, although, of course, the con-

The landlord provides the land cleared, fenced, tenant is required to provide all the implements the land, and all the labour. The tenant must own dwelling, though it is not infrequent for the landlord to supply the iron roofing material; and right of ownership is usually allowed to the tenant in all buildings which he has himself erected. With regard to sharing the proceeds, the almost universal rule is for the grain to be divided equally between landlord

and tenant. On certain stations a bonus is allowed as a reward for good cultivation, the tenant receiving half the crop up to a certain yield per acre, and all in excess of this amount; and on some estates the tenant receives as much as three-fifths or two-thirds of the total yield. Each

share-farming for wheat are, on ditions vary in different cases. and ready for the plough. The and horses necessary to work generally make provision for his



A COUPLE OF COMFORTABLE HOMES.

party usually finds the bags needed for his own share of the crop. Often the landlord supplies all the seed, but not infrequently the tenant is required to provide the same proportion of

the seed as he receives of the harvest. For a man to succeed, or indeed even to make a commencement at share-farming for wheat, it is, of course, absolutely essential that he should have at least sufficient capital to buy horses and plant, and to provide a dwelling. In isolated instances landowners are prepared to assist their tenants by finding implements and horses for picked men who have first worked with them as labourers to prove their capacity ; but such cases are quite exceptional.

For dairy-farming on shares, however, nothing is needed but thorough practical experience in the management of dairy cattle and the general work of a dairy. Large estates have been thrown open in the coastal districts and elsewhere, notably at Bolaro in the Monaro district, and on the northern rivers. On these estates the landlord usually provides land, milch cows, dwelling, cow-bails, piggeries, &c., and the tenant finds all the labour for milking, rearing calves and pigs, and cultivating sufficient land to provide feed for the winter. The butter is almost invariably made at one of the many butter factories which exist in every dairying district, and the milk or cream is carted by the tenant to the factory. As a general rule the tenant receives from 6s. to 10s. in the £ on the proceeds of all butter and all pigs sold, and also an allowance for each calf reared.

Anyone who wishes to make a success of share-farming must, of course, be possessed of a sound practical agricultural training, and no landowner would dream of placing valuable dairy cattle in the hands of a tenant unless he were thoroughly satisfied of the tenant's capacity. But given the requisite experience, industry, and thrift (and, in the case of wheat or mixed farming, sufficient capital at the outset to provide horses and plant), the share-farmer has every prospect of making a comfortable living, and of earning enough to establish himself upon a farm of his own within a reasonable time.



AT WORK AMONG THE VINES.

THE CULTURE OF WHEAT.

This work does not aim in any shape or form at filling the functions of an agricultural text-book; nor does it propose to instruct technically either the man at present on the land or the newcomer who may arrive here from distant countries to till our soil. Still, as the Australian conditions are so different from those of lands in the northern hemisphere, it has



IANDRA WHEAT-FIELD.

been thought wise to incorporate in this chapter a few observations by Mr. McKeown, Manager of the Wagga Experimental Farm, upon the culture of wheat, the most prominent of the crops. Mr. McKeown's remarks, which apply specially to the Riverina, where a considerable proportion of the State's wheat is grown, are as follows:—

The culture of wheat can be profitably carried out on an immense area of land in the Riverina district. In most parts the contour of the land and the texture of the soil are such as to render its production possible at a low cost in comparison with many other districts. The effects of the dry seasons which periodically occur may to a considerable extent be mitigated by a thorough preparation of the land—by the use of fertilisers, and by growers confining their operations to such moderate areas as will admit of seasonable sowing and harvesting. It is, however, undesirable to engage in the growth of wheat on a commercial scale in any district in which the rainfall is liable to be less than 13 inches. An important factor in successful wheat-culture is the system of fallowing land, which admits of the reception of all the moisture which falls after the land is broken, and the retention of a larger proportion of it than is possible in unbroken land. The system next in order of merit is early ploughing of stubble land by means of ploughs of improved construction. Both of these systems admit of the early sowing of the seed, which is necessary to secure the best results, as early sown seed stools or tillers much more extensively than that which may be classed as late sown. A fruitful cause of depreciated profit on

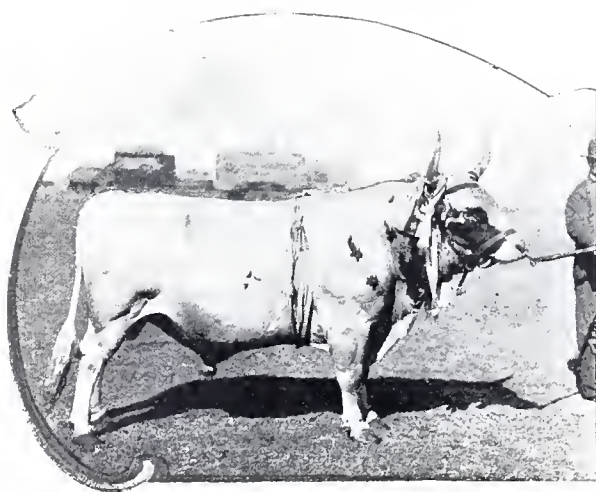
wheat-culture has been the attempts of many growers to cultivate too large an area. The results have been—imperfectly prepared land, delayed sowing, and even when under the most favourable natural conditions fair crops have been raised, the inability of the grower to harvest his crop because of the excessive extent of his land.

During the six years from 1899 to 1904 the average annual rainfall at the Wagga Experimental Farm was 17·66 inches, while that of the growing period of the crops from 1st May to 15th November was 11·4 inches. The highest average yield of any variety of wheat sown during that period was obtained from Farmer's Friend, which returned 21 bushels 12 lb. per acre, with Hudson's Early Purple Straw next with 20 bushels 4 lb.; several other varieties following in close order. Several new varieties cultivated during the last three years have given good results—Federation being first with a little over 22 bushels per acre. The land was treated with fertilisers at a moderate cost, and the results have been very profitable.

Experience in a variety of seasons has furnished ample proof that it will pay wheat-growers to thoroughly prepare the land for sowing, and it is recommended that all soils of fair depth should be ploughed to a depth of 6 inches where practicable. This cannot be accomplished under all conditions experienced here, as much of the Riverina soil sets very hard in dry weather, and is then difficult to handle.

The use of rotary disc ploughs has largely improved these conditions, as with them it is possible to start ploughing much earlier after the removal of a crop, or when weather conditions are unfavourable. In all seasons we have been able to commence work in January, and in a large proportion of our land it has been possible to perform excellent work in deeply ploughing and pulverising the soil. In addition to their being excellent dry-weather implements, their work is very economical, as we have ploughed up to 5 acres in eight hours with one plough drawn by five horses. The cost of discs is moderate, an expenditure of £3 10s. per year covering the wear and tear under this heading for, say, 500 acres. The cost of repairs is light, one of our ploughs having recently required some new parts for the first time after nearly six years' use.

The pulverisation of the soil to as great a depth as possible is of very great importance; therefore the value of these implements cannot be overrated. The system of shallow ploughing is to be condemned; and if farmers would prepare areas side by side ploughed deep and shallow respectively, they would soon become convinced that for the extra cost of breaking their land 6 inches instead of 3 inches deep, the increased crops would amply repay them.



It is sometimes urged that, as wheat is a surface-feeding plant, shallow ploughing is all that is necessary. A forest tree may exist in the soil contained in a 6-inch pot, but it cannot

attain its full development ; and wheat compelled to find nourishment in the upper 3 inches of the soil naturally cannot find as much food and moisture in that space as in 6 or 7 inches of free soil. Besides this, it is often found that when the first 6 inches of the soil is broken, that next below is sufficiently free to admit readily the roots of the plants in search of nourishment at a greater depth.

Rolling and Harrowing. In soil which is liable to crust on the surface, it is desirable, where rolling is necessary, to carry out the work before the seed is sown, and not to roll afterwards till the crop is fairly well grown, and then to follow with light harrows drawn across the drill furrows. Soils vary so greatly that it is not desirable to lay down any hard and fast rule on work of this kind, as much can be learnt by observation on the part of cultivators, many of whom have a variety of soils under their care in which uniform treatment would be undesirable. Under



WHEAT STOOKS.

our conditions we have usually found it best to leave the land with the slight furrows formed by the drills, as an even surface is very liable to crust and cause the rainfall to run off.

The harrowing of growing crops may be carried out until the crops are about 6 inches high, provided the soil is firm enough to keep the harrows from penetrating deeply, but it should not be done before the plants are well rooted.

Seed Selection. The importance of seed selection is again impressed upon those who are about to sow ; therefore, where individual farmers cannot afford a grader of the best kind, it is suggested that such implements be obtained and worked by groups of grain-growers for their mutual benefit.

Good implements, however, are obtainable at moderate prices ; and as considerably increased yields may be obtained by using only the best grade of seed, the cost of a machine would soon be recouped.

Some years ago tests of varying grades of seed sown by hand were carried out on a small scale on this farm, and the results were always in favour of the best qualities. Last season these tests were commenced on a larger scale as field crops, when No. 1 grade seed yielded $2\frac{1}{2}$ bushels more per acre than the second and third grades sown together.

**Method of
Sowing.**

The advantage of drilling over broadcasting seed has been frequently advocated and demonstrated, as will be seen by the accompanying statement of returns. The increased yield, together with the saving in cost of seed, will more than cover the cost of a drill on the first 150 acres. The yields from varying quantities of seed are also shown, and they amply demonstrate the desirability of sowing only moderate quantities of seed, as although sowings of 60 lb. per acre show a larger total return, the average gain from the extra 20 lb. of seed is only at the rate of 4 lb. per acre.

For general field work we set our drills to sow half a bushel; and as grain varies in size according to variety, our average sowing will work out at about 33 lb. per acre. Half a bushel per acre under our conditions we regard as the minimum quantity to be sown.



CROP AT BOURKE IRRIGATED WITH ARTESIAN WATER.

As a preventive of smut and bunt, we treat the seed with a 2 per cent. (1 lb. to 5 gallons) solution of sulphate of copper, immersing the seed for not more than five minutes. Should the seed, however, not be well filled, the

Smut.

dipping should accordingly be of less duration. Some varieties are more liable to the attacks of bunt than others, and in such cases it has been found necessary to increase the quantity of bluestone to 3 per cent. (1 lb. to 3½ gallons). Ten gallons of solution should treat about 10 bushels of seed.

The best time for sowing is from the middle of April to the end of May ;

Sowing Time. but, when circumstances require it, a week in June may not be too late.

A good deal of sowing is carried out in Riverina before April ; but in our portion of the district crops sown so early, no matter what the variety of wheat, have a tendency to produce too much straw in good seasons.

Should insufficient rain fall in March or April, there is considerable risk of loss of seed, or at the least of a severe check to seed which may have obtained a start.

These risks, however, are greatly decreased by fallowing the land from winter or spring in the preceding year, as land so prepared is in a better condition to receive and retain such moisture as may fall between the ploughing and sowing seasons. As it is seldom that late sown seed returns anything like the crops harvested from seasonably sown areas, it will pay better to fallow such land as cannot be sown by the first week in June.



It has been further noted that a curtailment of the areas sown should place many growers in a position to carry out their harvesting more seasonably, thus benefiting themselves individually, in addition to increasing our district average, as much grain is lost by delayed harvesting.

The raising of wheaten hay for home consumption in ordinary seasons, for fodder reserves against drought seasons, or for sale in the city markets, is worthy of greater attention than is usually given to it. Under our conditions a crop of wheaten hay may be counted on with much more certainty

than is the case with oats, which requires much more moisture to bring it to perfection. It is, however, possible to secure payable crops of oaten hay when good varieties are sown early in the autumn.

The figures at foot show the crops of wheaten hay harvested at the Experimental Farm during the last five years. The method of preparing the land has been the same as that applied to land used for the production of grain.

The most successful fertiliser has been superphosphate containing a percentage of nitrogen and potash, the quantity used being 70 lb., costing 4s. 6d., per acre. In all cases the seed and manure have been sown with the drill, the quantity of seed used being 45 lb. per acre, first quality grain. March and April will be found the best months for sowing.

White straw wheats are far preferable to the purple straw varieties for haymaking, as the weight is much greater, the straw has far less "dead flag," and the hay is better liked by stock of all kinds. In selecting varieties care should be taken to choose those which carry a green colour to the lowest possible point on the straw. The varieties which have proved the best with us are Zealand or Berthoud, White Essex, Australian Talavera, and White Lammas,

in the order named. The best stage of growth for cutting wheat for hay, to secure weight, colour, and quality, is just when it is flowering. If properly saved at this stage and cut into chaff not less than half-an-inch, it will command the best prices in the Sydney market, as the best quality Riverina chaff is much sought after.

The portion of 1903 crop sold in Sydney in September realised up to £4 per ton, averaging £3 17s. 10d. for about 80 tons. The yields recorded will show that hay-growing is a profitable branch of wheat-farming if carried out with due attention to all details.

YIELDS OF HAY.

Year.	Area sown.	Crop harvested.
1900	154 acres.	523 tons.
1901	176 „	417 „
1902*	200 „	36 „
1903†	205 „	609 „
1904	200 „	227 „

* A year of drought.

† In addition to about 100 tons silage.

Average yield per acre for five years, 1 ton 18 cwt. 3 qrs.

Average annual rainfall for these five years, 18·01.

Average rainfall for twenty-five years, 22 inches.

Cost of cutting, freight, sacks, and marketing, £1 15s. per ton.



STACKING HAY AT BOURKE—PERA BORE.



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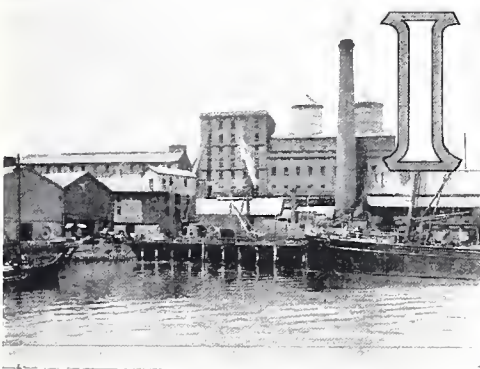
CHAPTER XIII.

Agricultural Education.

Experimental Farms—Assistance given to Students and others anxious to gain Agricultural Experience.

By W. S. CAMPBELL, F.L.S.,

DIRECTOR OF AGRICULTURE.



IN various parts of the State experimental farms have been established by the Government for the purpose of ascertaining the most suitable economic plants to grow in the particular districts in which these farms are situated; and also to demonstrate how best to produce crops in the most suitable and economic manner whenever frequent experiments have indicated the kinds likely to prove profitable. The importance of a good method of rotation cannot be too strongly advocated, and the determination of the best methods

to adopt is being worked out on the several farms, and experiments are being carried out with cattle and sheep, in view of their value in connection with rotations. Important trials in the crossing of various breeds of sheep are being made to determine, if possible, the best cross for the use of farmers and the production of lambs for home and export markets.

In view of the remarkable increase and prospective growth of the Dairying industry several breeds of dairy cattle of the best procurable strains have been imported from Europe, with a view to general improvement in dairy stock. A stud farm has been established where cattle are bred for distribution by sale, or by the leasing out of bulls at reasonable charges, and there is no doubt that this work by the Agricultural Department has already had a marked effect on some of the dairy herds.

An Agricultural College at Richmond, named the Hawkesbury Agricultural College, was established some years ago for the instruction of young men in practical and scientific Agriculture. So greatly has the demand for instruction in agriculture increased that it has been found necessary to enlarge the buildings whereby two hundred students will, within the next few months, be accommodated. At the present time one hundred and fifty students are provided for. The Hawkesbury College is distant from the town of Richmond one mile only. This town is 38 miles

**The
Hawkesbury.**



HAWKESBURY AGRICULTURAL COLLEGE.

from Sydney, and is easily accessible by train from Redfern Railway Station. The farm in connection with the College comprises an area of 3,500 acres of land, 1,000 acres of which is under cultivation. One hundred and eighteen acres of land in addition to this have recently been acquired by lease on the bank of the Hawkesbury River. This land on the river is extremely fertile, capable of being irrigated, and, consequently, of much value in the education of the students.

The farm equipment is ample and of the most modern type, and students have every opportunity of making themselves proficient in various branches of agriculture and horticulture. The dairy is well stocked with suitable breeds of dairy cattle and pigs. The orchard gives an opportunity of acquiring a thorough knowledge of all branches of orchard work, the drying and canning of fruits, the making of preserves, of tree planting, pruning, grafting, budding, as well as the application of farmyard manure, artificial manures, and of green manuring. Instruction is also given in various branches of gardening. Full instruction is afforded in poultry-rearing, and also in bee-keeping.

Instruction is given in carpentry, building, in blacksmithing, and also in engine-driving, and in the use of electricity. In the class rooms instruction in chemistry, botany, bacteriology and their practical application, veterinary science, wool-sorting, the use of the microscope, book-keeping, &c., &c., is given. The course extends over two years, or four sessions, and each candidate must be over the age of 16 years.

Each resident student is required to provide himself with the following articles :—Two suits working clothes, one suit for Sunday wear, two pairs suitable boots and one pair slippers, hair brush and comb, one clothes-brush, four sheets, three pillow-slips, six strong bath towels, two large aprons for the chemical laboratory, set of mosquito nets. All wearing apparel, bed linen, &c., must be distinctly marked with the name of the student, otherwise it will not be taken to the laundry.

The academic year is divided into two sessions :—The first session commences 23rd January, and ends 22nd June, and the second on 23rd July, ending 22nd December. Students are admitted, for practical work only, at the Wagga Wagga Experimental Farm, Bathurst Experimental Farm, Wollongbar Experimental Farm, and at the Stud Farm, Berry.

The main objects of the Wagga Farm are to make experiments with wheats, **Wagga Wagga.** and other cereals, various kinds of fruits, and the keeping of sheep, horses, and cattle, and to carry out exact scientific experiments, with manures, the breeding or making of wheats, &c., and much valuable work has been done. Another important work carried out here is the demonstrating of the most economic and effective systems of harvesting crops.

The experiments with fruit-trees and grape-vines have been considerable. Hundreds of various kinds of fruits have been tested as to their suitability for soil and climate. These experiments have proved the value of grapes and prunes for drying purposes, and several varieties are now grown here to demonstrate their value from a commercial point of view. The experiments made with the production of a cross-bred sheep for the use of farmers have proved highly successful and profitable. A herd of dairy cattle, and a considerable number of pigs, pure strains of poultry and turkeys are kept, and also a Suffolk punch stallion for breeding purposes.

Within a short distance of the city of Bathurst is situated the Experimental **Bathurst.** Farm, which contains about 700 acres of land. Here numerous important experiments are carried on with cereals, fodders, fruit-trees, sheep, and cattle; rotations of crops, and so on. This farm has excited considerable attention in consequence of the demonstrations given of the great increase of its crops over all other crops grown in the district, and also the magnificent fruit produced in the orchard, which comprises an area of 40 acres. In connection with this farm, but distant about 2 miles, there is an area of land of about 20 acres on the southern bank of the Macquarie River. This is used for irrigation purposes with a view to illustrate the value of similar alluvial land when irrigated. Students for practical work only are trained at this farm.



SNOW GUMS.

The Wollongbar Experimental Farm is situated in the Richmond River district, on the road from Lismore to Ballina, within one of the finest dairying districts in Australasia. Here experiments are carried out in the cultivation of textiles, sisal hemp, ramie fibre, wattles, grasses, and other fodders, sugar-cane, tropical fruits, and various other economic plants. A number of fine dairy cattle of several breeds are kept here, also a small flock of Romney Marsh sheep, which thrive well, and several breeds of pigs. Students are admitted here for practical work chiefly in connection with the dairying industry. This farm comprises an area of 273 acres.

About 3 miles to the west of Glen Innes an experimental farm, comprising an area of 1,000 acres, has recently been established, which will form an important centre of agricultural education in the near future for the New England district, for a great deal of valuable information will be gained from experiments carried out here. So far the work has been satisfactory, and promising good results. Important experiments are being carried out with cereals of many kinds, grasses and fodder plants, and the crossing of several kinds of sheep, with a view to determining the best cross for a farmer's sheep, and the production of lambs for the market. At present there is no accommodation for students.

About 7 miles north of Grafton, in the Clarence River district, a magnificent area of land has been set apart for an experimental farm. This comprises land varying from the poorest description to that of the richest alluvial in the district. Up to the present but little work has been carried out. There is a fine herd of dairy cattle kept here for the improvement of the district. Shortly farming work and started, with a view the farming of the district. Experiments will be made of maize, the growing being an important industry in the district. Tests of potatoes, fodders, grasses, and many economic plants will be made. A small flock of Romney Marsh sheep is kept here, and notwithstanding the moist climate and heavy rainfall, these sheep succeed well, and many inquiries respecting them have already been made by farmers in the district who are likely to follow the example given.



The Departmental stud farm for dairy cattle has been established about one mile to the south of Berry, near the Shoalhaven River, on the South Coast. Here are kept several of the best breeds of imported dairy cattle and their progeny. Breeding is carried on, and any young bulls which can be spared are sold. Other bulls are leased to farmers under certain conditions for six months. The demand for these

bulls is so great that it is impossible to meet requirements. Students are taken at Berry for a course of dairy instruction in cheese-making, butter-making, the breeding of dairy stock, &c., at the nominal fee of £2 2s. for a full course of twelve months, but they must find their own board and residence.

Breeding Wheat. Near the town of Cowra an experimental farm has been established recently, chiefly for the purpose of carrying out experiments in the breeding of wheats for Australian conditions, raising the purest seed which it is possible to grow, experiments with other cereals, the use of manures, experiments in various methods of ploughing, seed-sowing, &c. This farm is worked in conjunction with the Coolabah Experimental Farm, which is situated in the arid western country,



A GOOD RESULT FROM THE DISC PLOUGH.

about 80 miles east of Bourke, and 18 miles north of the Western railway line. Here valuable trials are being made with wheats likely to prove suitable and profitable in dry districts.

Artesian-water Irrigation. Near Bourke a small experimental farm has been established at the Pera Artesian bore, where experiments in irrigation are made with the bore water. The chief work carried out is the cultivation of the orange, which thrives exceedingly well and produces excellent fruit, bringing very high prices locally and in other markets. At Moree, experiments in irrigating are carried on at a small experimental farm with artesian bore water. These experiments are valuable, and much interest is taken in them, for it has been demonstrated that the bore water is suitable for many kinds of crops, fruits, and vegetables, notwithstanding fears that the water

contained too much alkali for the growth of vegetation if used for any length of time. This water has been used at Moree for more than seven years, and no deleterious effect whatever is apparent on the crops now raised. The same may be said with respect to the water at the Pera farm.

At Howlong the Viticultural Station was established to propagate
Howlong. phylloxera-resisting vine stocks, for the use of these vines in districts where the phylloxera has completely destroyed many vineyards. Here many useful trials and experiments are being carried on to test the most suitable varieties of the resistant vines for various soils and localities, and also the suitability of these vines as stocks for table as well as wine grapes. Large numbers of cuttings and rootings are distributed annually, and many old vineyards are likely to become re-established and profitable.

Except where otherwise stated the fee charged for the admission of a
Fees. student to the abovementioned farms is £25 per annum. If, after the expiry of one month from the date of the payment of this fee, an enrolled student fails to put in an appearance at the farm, he is then disqualified, and the fee paid is forfeited unless he is able to satisfy the Minister that his absence was due to some sufficient cause. Except in the case of the Berry Stud Farm each student must deposit the sum of £1 to defray any damage he may cause to farm property, &c., during his course.

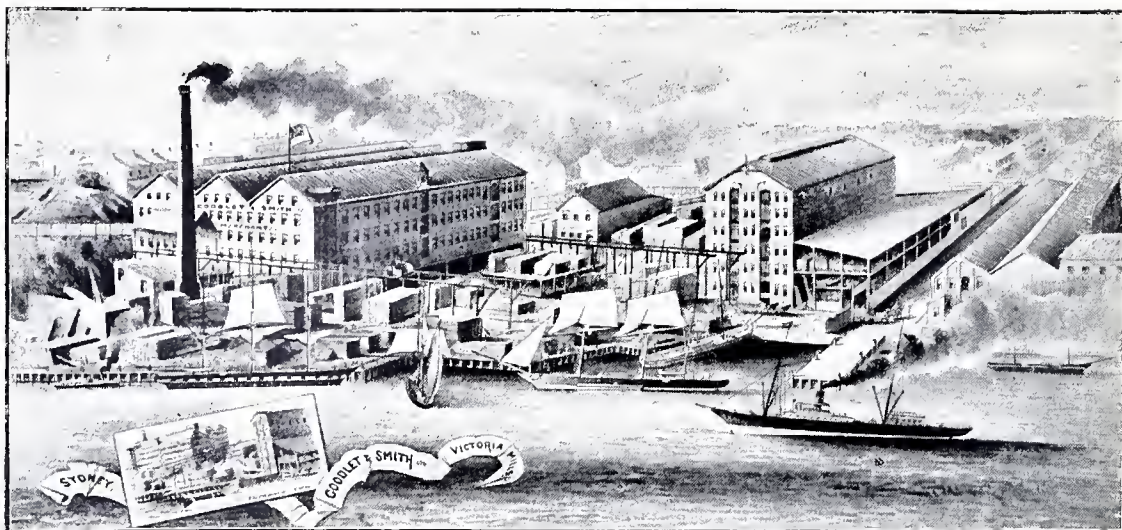


A COAST SCENE.



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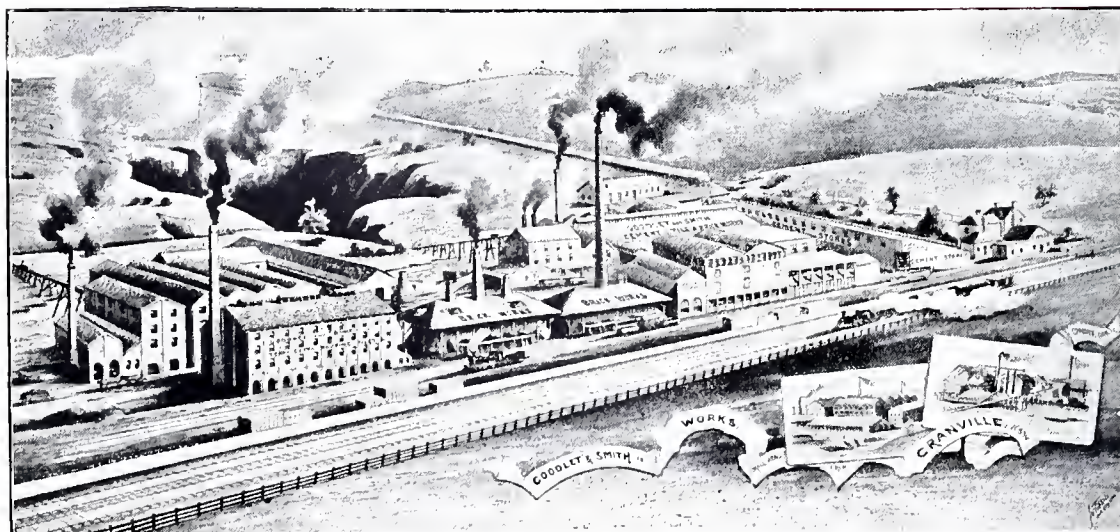
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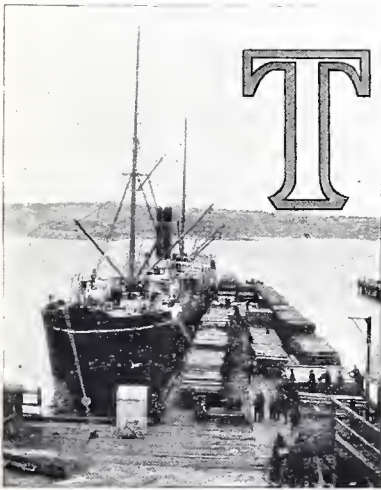
Cement,
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Timber Industry.

Timber Industry—State Control of Forestry—Building Materials—Cost of Erecting Home, Farm Buildings, and Fencing.

BY R. DALRYMPLE-HAY,

CHIEF FORESTER.



TO intending settlers the question of timber supply is almost as important as that of water. The man about to settle on the land will naturally, among other questions, ask for information on this point, and, as far as the State as a whole is concerned, he can be most readily answered by quoting from a recent official report on Forestry (1902), which in regard to timber resources reads as follows:—

“Although not well distributed the State’s timber resources are large, particularly in the coastal or eastern portion. Of ordinary hardwoods there is an extensive supply available, and a large margin for export. In localities not immediately accessible the forests of this timber are practi-

cally virgin. The timber resources of the highland zone, although not varied, are large, there being sufficient supply to meet present and future requirements.

“Inland the supply in proportion to the area of territory is limited—in parts it is unequal to the demands of settlement; in this part of the State, timbers of commercial value are, generally speaking, confined to the timber reservations.”

From this it will be seen that in the North and South Coast Districts, as well as in the Northern and Southern Tablelands, there need be no anxiety about ample supplies of timber, but on the western slopes the climatic conditions are not so favourable to forest growth, and, therefore, the supply of timber is limited. It would not do, however, to infer that timber in the west is not obtainable, but it would be as well for the intending settler to bear in mind that in that part of the State it is less plentiful than elsewhere, and, therefore, the cost is relatively higher than on the coast or tableland.



CENTENNIAL PARK.



TYPE OF OPEN COASTAL FOREST.

An Industry of some Proportions. The timber industry of New South Wales is one of some proportions, and the demand for sawn timber is supplied by the working of 324 saw mills in various parts of the State. Quite 60 per cent. of these are located in the coastal districts, but the distribution of the remainder is sufficiently wide to assure the possibility of obtaining sawn timber for building purposes in every part of the State where the conditions are suitable for settlement.

Location of Timbers. The following is a brief description of the principal timbers to be obtained in each of the five climatic districts. The North Coast stretches from the Hawkesbury River north to the Queensland border, and inland to the margin of the tableland. Throughout this tract, which is the best timbered in the State, a great variety of hardwood timbers, suitable for building and constructive purposes, is obtainable, and in the brushes, which principally occur on the higher lands north of the Manning River, brush or softwoods are abundant. The hardwoods comprise ironbark, tallow-wood, blackbutt, Sydney blue gum, spotted gum, grey gum, red and white mahogany, turpentine, and brush box. The principal soft or brush woods are red cedar, rosewood, black and red bean, onion wood, white beech, silky oak, coachwood, tulipwood, Colonial pine, and native teak.

In the South Coast, extending from the Great Western Railway Line south to the Victorian border, and inland to the Main Dividing Range, are principally hardwoods, comprising ironbark, blackbutt, spotted gum, stringybark, grey box, forest red gum, Sydney blue gum, woollybutt, bloodwood, and turpentine.

The Northern Tableland, embracing the highlands north from the Great Western Railway Line to the Queensland border, contains principally hardwoods comprising stringybark, blackbutt, ironbark, yellow box, grey box, and forest red gum.

The Southern Tableland, the highlands south from the Great Western Railway Line to the Victorian border, is timbered chiefly with hardwoods, comprising stringybarks, mountain ash, messmate, white and yellow box, and mountain gum.

The Western Slopes extend from the western margin of the tableland to within 100 miles of the Darling River. The principal timber of this tract is cypress pine; but other timbers such as ironbark, grey box, yellow box, and Murray red gum occur in different parts. Cypress pine is widely distributed over the whole of the Western Slopes, but is by no means plentiful, a large extent of this tract being treeless country. Box usually grows with cypress pine, and frequently ironbark is found also. Ironbark occurs principally to the north of the Great Western Railway Line, and Murray red gum is confined to the river systems, its principal locality being between the Murray and Murrumbidgee.



Forestry in New South Wales is under State control, and of the total **The Forests.** estimated area of 20,000,000 acres of timbered land, 7,500,000 acres have been reserved and set apart for the conservation of the timber supply. The forest laws are embodied in a code of regulations, under which all workers in Crown forests



are required to register or license themselves. In addition to the license fee, a royalty at the rate of 7d. per 100 superficial feet on ironbark, 5d. on other hardwoods, 6d. on brush or softwoods, 9d. on eypress pine, and 1s. 6d. on red cedar and Murray red gum is charged on the quantity of timber obtained under the license. In addition to other matters, the regulations provide the minimum girths at which trees may be felled. The forest laws do not apply in the case of lands taken up for settlement purposes, and under both freehold and leasehold tenures

the settler is entitled to the free use of whatever timber is on the land allotted to him. One of the leading characteristics of the Australian forests is rapidity of growth and abundant natural reproduction.

Hardwoods The hardwoods of New South Wales have achieved a world-wide reputation, and it is universally admitted that for street-paving they have no
have no superior. A considerable export trade, and one which is capable of great
Superior. expansion, is already done in these timbers, although comparatively little
has been effected in the way of making their virtues known to the world.

Railway sleepers of the highest grade are also cut from New South Wales hardwoods, while New South Wales turpentine piles for wharves or piers have been found to be in such sound condition on being drawn after thirty years service in the water, that they have been used again in new structures. New South Wales hardwoods are remarkable for the great size of the beams which may be obtained from them, as well as for the strength and durability of their wood. Ironbark girders for building have not only the advantage of great size and strength, but they are in addition almost fire-proof. Their use in a building is an almost certain assurance that no matter how fierce the fire which rages the exterior walls will remain standing, instead of collapsing as they invariably do when stayed by steel girders, which, when hot, crumple under the application of water.

It is not alone, however, in her hardwoods that New South Wales is entitled to notice on account of her timbers. The softwoods in the brush forests of the coastal region rival those of any other part of the world. Some of the least known of these trees have wood grained and marked most beautifully, which is susceptible of the highest polish. These woods are adapted to the finest description of cabinet-making.

**The Settler's
House.**


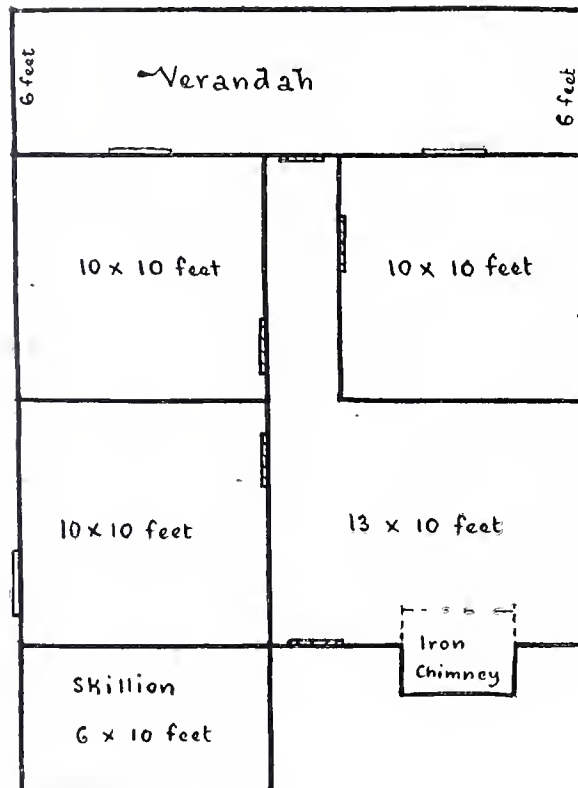

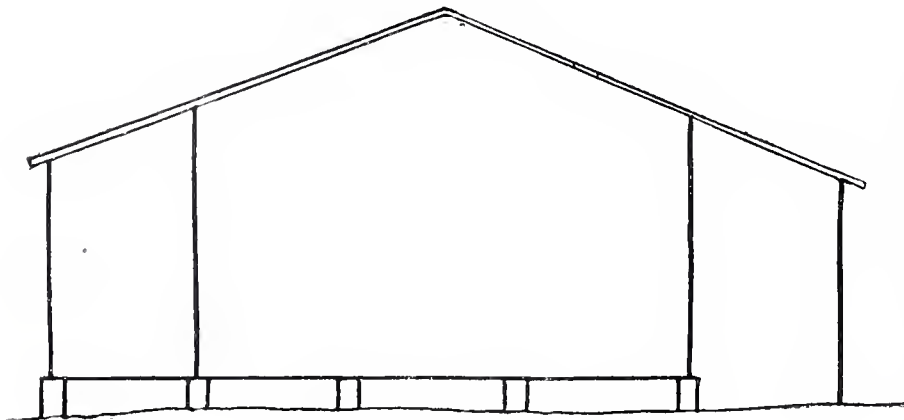
In building homes on the land, the class of material used is largely regulated by situation. In well-timbered country the settler usually commences by erecting what is called a slab hut, the framing of which is constructed of sapling timber, the sides of slabs split from larger trees, and the roof of bark. This is necessarily a rough form of building, it is seldom floored, and, as a rule, it is in course of time replaced by a more pretentious building erected in the foreground, and the original building is converted to kitchen or other uses. Some settlers with ideas of greater comfort and a little capital to spare, start with a better class of building, constructed of sawn timber with galvanized-iron roofing, and floored, lined, and partitioned with sawn timber. The form of this building is invariably a cottage on wood block foundations, with a verandah in front and a skillion at back. Sometimes, where cost is a consideration, interior lining of the walls is omitted, and the partitions are only lined on one side. As a preventive to the intrusion of white ant, the wood block foundations are capped with zinc. Apart



TYPE OF BRUSH FOREST—COASTAL DISTRICTS.

TYPE OF SETTLER'S HOME.

Constructed of Sawn Timber with Galvanized Iron Roof.

PlanWindows thus Doors thus Elevation

from living comfort one of the principal advantages of a building of this description is the catchment it provides for the collection of rain water, which is stored in iron tanks.

The cost of erecting homes, whether of the slab hut description or the more pretentious cottage of sawn timber, is again largely dependent upon situation. If a supply of timber is available on the land, the cost of homes, farm buildings, and outhouses of slabs and sapling timber, with bark roofing, is merely that of the labour involved, together with a nominal cost for nails and fittings. To arrive at an estimate of cost for the better class of building, a type must be taken, and that shown on the opposite page is selected as being one of the character usually erected by settlers.



ICEBERGS ON THE SNOWY RIVER, MOUNT KOSCIUSKO.

The quantity of material required for the erection of a building of this type, including labour, would cost the amounts shown in the following table, but if the settler can undertake to build his own home, the cost of labour, about 15 per cent., may be deducted.

APPROXIMATE Cost of erecting Settler's Home as per type, built of sawn timber and galvanized iron, including labour and three 800-gallon water-tanks.

Districts.	Iron at an average cost of £23 per ton.							
	Timber at 10s. per 100 super.		Timber at 12s. per 100 super.		Timber at 14s. per 100 super.		Timber at 16s. per 100 super.	
	Without Linings.	With Linings.	Without Linings.	With Linings.	Without Linings.	With Linings.	Without Linings.	With Linings.
North Coast	£	£	£	£	£	£	£	£
South Coast	64	80	77	97	90	113	103	129
Northern Tableland ...	68	84	81	100	95	117	109	134
Southern Tableland ...	81	100	98	120	114	140	130	160
Western Slopes								

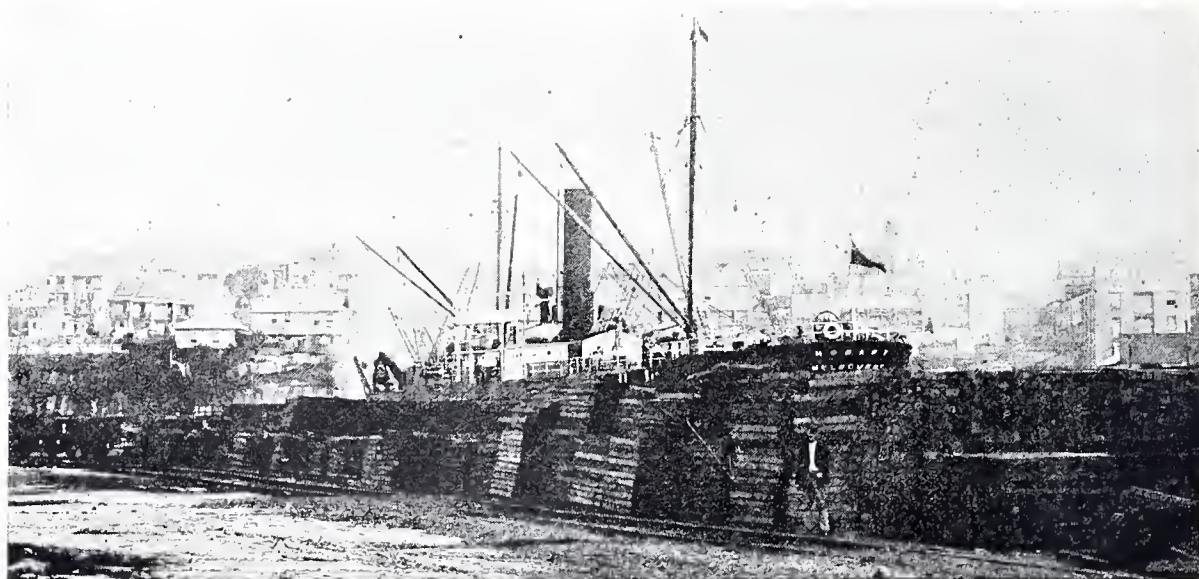
The approximate cost of sawn building timber in the various districts of the State is as under :—

North Coast, hardwood,	about	10s. per 100 feet super.
South Coast	„	10s. „
Northern Tableland	„	13s. „
„ „ cypress pine	„	16s. „
Southern Tableland, hardwood,	„	13s. „
Western Slopes, cypress pine	„	16s. „

One of the first improvements the settler finds necessary, and if the land carries timber it is generally undertaken at the same time as clearing operations, is that of fencing. The type of fence adopted for enclosing a holding varies with the purpose for which it is to be used. For agricultural plots post and wire fencing is, perhaps, the commonest form, and where it is necessary to exclude rabbits and other vermin the fence is wire-netted about 3 feet from the ground. For a cattle fence, such as would be required for enclosing a dairy farm, post and barbed wire is frequently used, but the more substantial post and two-rail fence is preferred if suitable timber is available. A sheep fence is usually post and six wires. The posts in such a fence are sometimes spread to 12 feet apart, and the wires are stapled midway on spreaders or battens. Amongst other types of fencing erected by settlers for different purposes are posts, top rail, and four to six wires; posts, two rails, and two to four wires; cockatoo fencing; and chock and log fencing. In all fences of the post and rail class the material used, if split from matured trees, makes a more durable and lasting fence than one erected from round or sapling timber.

The following types of fencing are common to the different divisions of the State, and can be erected for approximately the prices quoted, which include both labour and material :—

District.	Type of Fence common to the District.	Approximate Cost per mile.
North Coast	Split posts, 2 rails, and 4 wires	£ 58
South Coast	„ and 2 rails	40
Northern and Southern Table-lands	„ and 6 wires	35
„	„ and wires (netted rabbit-proof)	65
Western Slopes	„ and 6 wires	38
„	„ and wires (netted rabbit-proof)	70



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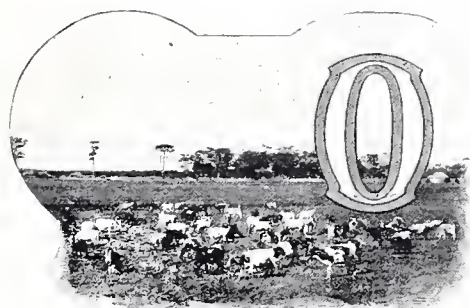
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E. J. E. MACKENZIE, Manager.

Cost of Stocking and Working a Farm

Australian and British Methods Compared.



ON the subject of the cost of stocking and working a farm, contributions are made by Messrs. R. W. Peacock, C. H. Gorman, and G. M. McKeown, Managers of State Experimental Farms at Bathurst, Wollongbar, and Wagga, respectively, centres widely separated in point of distance, climate, and conditions.

Mr. Peacock gives the following estimate:—The cost of stocking and working a farm is based upon the assumption that the farm is of an area of 300 acres, 100 of which is devoted to arable farming, and the balance to grazing, and situated in a district suitable for mixed farming.

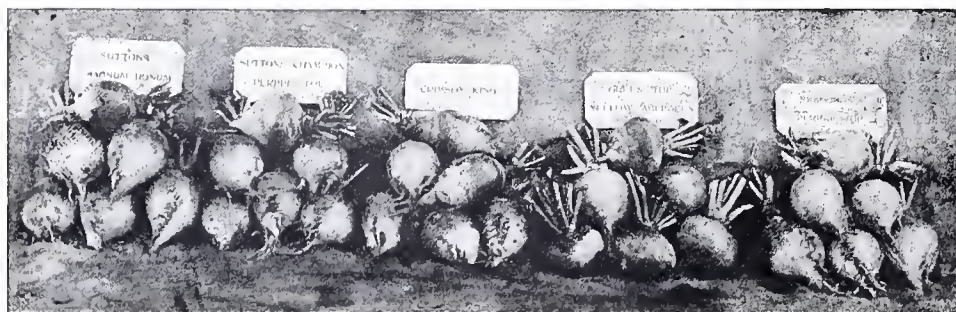
Live stock required:—						£	s.	d.
3 draught horses (2 heavy and 1 active), @ £25 each	..	..	..	..	..	75	0	0
12 dairy cows, @ £7 each	..	..	..	..	..	84	0	0
100 ewes, off shears, @ 10s. each	..	..	..	..	..	50	0	0
2 Flock rams, @ £3 each	..	..	..	..	..	6	0	0
2 breeding sows in pig, @ £3 each	..	..	..	..	..	6	0	0
6 pairs of poultry, @ 3s. per pair	..	..	..	..	..	0	18	0
Machinery, harness, and tools required:—								
1 double-furrow plough	..	..	..	..	..	11	10	0
1 set of three harrows	..	..	..	..	..	4	10	0
1 two-horse dray	..	..	..	..	..	16	0	0
1 spring cart	..	..	..	..	..	12	0	0
1 reaper and binder	..	..	..	..	..	40	0	0
1 separator	..	..	..	..	..	20	0	0
1 set of swingle bars	..	..	..	..	..	1	7	6
Harness—								
3 horse collars, @ 18s.	..	..	..	..	..	2	14	0
3 pairs blinkers, @ 10s. 6d.	..	..	..	..	..	1	11	6
3 sets of hames and straps, @ 7s. 6d.	..	..	..	..	..	1	2	6
3 plough backs and chains, @ 10s. 6d.	..	..	..	..	..	1	11	6
1 dray cart saddle, breeching, and belly band	..	..	..	..	..	2	10	0
1 set of leading harness (backband, hip straps, and chains)	..	..	..	..	..	1	7	6
1 set of cart harness, without collar or blinkers	..	..	..	..	..	3	5	0
1 set of plough reins	..	..	..	..	..	0	2	0
1 saddle and bridle	..	..	..	..	..	3	10	0
Carried forward	..	..	..	..	..	£344	19	6

							£	s.	d.
Brought forward	..	..	..	..	..	..	344	19	6
Tools—									
Grindstone and fittings	..	..	..	..	..	..	0	10	0
Spade	..	..	..	..	..	..	0	4	6
Digging fork	..	..	..	..	..	..	0	4	0
Pick	..	..	..	..	..	..	0	3	6
Long-handled shovel	..	..	..	..	..	..	0	3	6
Hoe and handle	..	..	..	..	..	..	0	2	0
Mattock and handle	..	..	..	..	..	..	0	4	6
Crowbar	..	..	..	..	..	..	0	5	0
Axe and handle	..	..	..	..	..	..	0	5	0
Adze	..	..	..	..	..	..	0	5	0
Hatchet	..	..	..	..	..	..	0	2	6
Claw-hammer	..	..	..	..	..	..	0	2	6
Brace	..	..	..	..	..	..	0	3	6
Set of bits for brace	..	..	..	..	..	..	0	5	0
Shifting wrench	..	..	..	..	..	..	0	2	6
Handsaw	..	..	..	..	..	..	0	5	0
Scythe and handle	..	..	..	..	..	..	0	6	0
Sickle	..	..	..	..	..	..	0	1	6
Hayforks (3)	..	..	..	..	..	..	0	6	0
Total	..	..	..	..	..	..	£349	1	0

The estimate of the live stock required is based upon the assumption that crops are to be grown for the stock to supplement the natural pastures; without such practice the land would need to be beyond the average, or the number of stock reduced. The class of stock carried could be varied at the discretion of the farmer.

The estimate for machinery and tools is for those which are practically indispensable. A reaper and binder may advantageously be purchased for the use of two farmers, as one machine can very well deal with an area of 200 to 250 acres of cereals during one season. It might also be possible to get such work contracted for, thus saving the expenditure when only small areas are under crops necessitating its use.

The labour necessary upon a farm of the above capacity could be performed by the proprietor and a lad employed permanently, with a hired man for about eight weeks during the harvest or busiest portion of the year. The wages required for the lad would be from 5s. to 10s.



AN EXPERIMENTAL PLOT.

per week and his keep. For the hired man 20s. to 30s. per week and keep. The cost of keep upon the farm would be from 6s. to 7s. per week.

Mr. Gorman of the
Cost of a Wollongbar Experi-
Dairy Plant and mental Farm, deals
Stock. with the cost of
 stocking a dairy

farm as follows :—The following particulars will cover the cost of stocking a dairy farm in the North Coast dairying districts, watered by the Clarence, Richmond, and Tweed Rivers. Presuming that suitable land has been secured for the purpose of dairying, the

most important point to bear in mind is suitable cattle, and, although at the outset it might be thought that cheap cattle are quite good enough to make a start with, intending dairy farmers will find it to their advantage to secure something likely to show a return in progeny. Nothing is more important than to secure a good class of dairy beast, and these can be secured after careful inspection. If milk and butter is what is required, the cross-bred cow will be the most profitable, but by selecting a pure breed, stud breeding can be combined with the production of butter. This course, however, is recommended to those who have had a long experience in breeding rather than beginners, and in many cases one is sacrificed to the other.



It must be borne in mind that dairy cows are breeding continuously, and much thought should be given to the progeny. Are they as good as the dams? If not, something is wrong, and a cause must be looked for. Is it in the sire in use? I wish to emphasise the necessity of having a thoroughly good sire at the head of the herd. In dairying, unless a good sire is in use, the herd will be going back rather than forward; therefore, in selecting a sire for your dairy herd, get the very best available, and a pure sire at that. I consider that the sire is the most important item in the dairy herd; and if a farmer can afford to give good prices for cows, he must be able to afford a good price for a sire. It would be better to have fewer cows and a good sire than to obtain a lot of cows and a poor sire. It may not be noticed at first, but when the progeny begin to come in, regrets will soon be expressed at the look of them, and later on at the result of them. Therefore, in thinking of stocking a dairy farm, first of all select a first class bull of known milking strain. It is not intended to suggest the particular breed to go in for, because each of the dairy breeds have their own virtue for their own district. The following breeds do well in the North Coast, viz.:—Jersey, Guernsey, Ayrshire, and Milking Shorthorn. The latter is now almost considered an Australian breed, and as such traces its origin to the South Coast of the State. Breeds such as the Holstein and Red Poll are suitable where it is intended to go for raising steers as well as dairying. A dairy bull of good strain can be purchased for from £15 to £35, and it will pay well to start as I have suggested with a good sire for the herd. Milking cows can be purchased for from £6 10s. to £15; springing heifers, from £5 to £10; backward heifers, from £4 to £6; young calves from £2 to £4.

In conjunction with dairying, pig fattening will always be carried on, and for this purpose cross-bred brood sows are most profitable, with a pure-bred hog of whatever breed is desired. Good brood sows can be obtained for from 25s. to £2, and pure bred hogs from £2 2s. to £7 7s.

Draught horses, suitable for all round farm work, can be bought for from £19 to £30, light horses from £9 to £20.

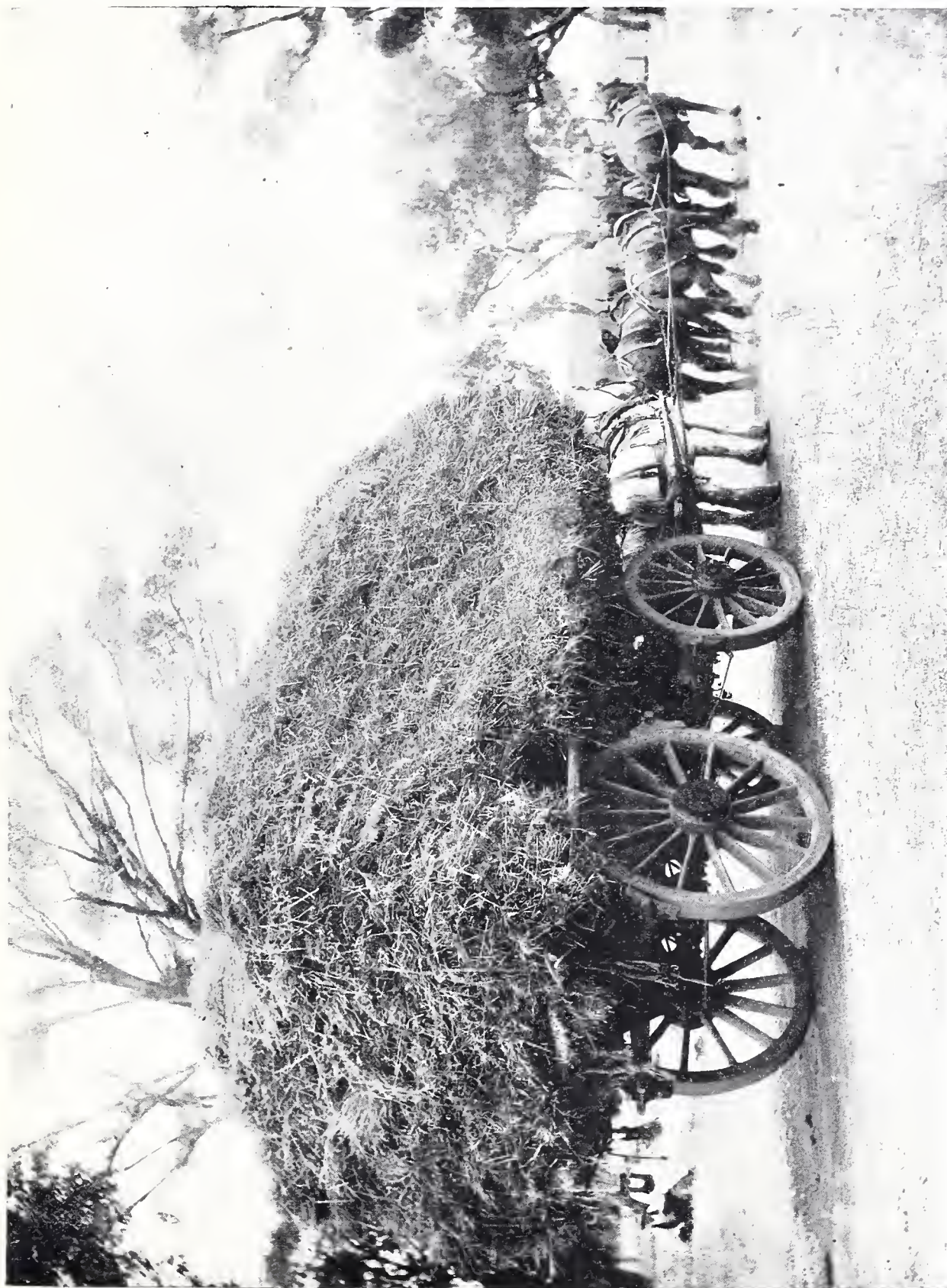
Those desirous of going in for a few sheep can obtain suitable rams (pure) from £2 2s. to £7 7s., and cross-bred breeding ewes for from 25s. to 37s. 6d. This of course will be an adjunct to dairying.

Farm hands are usually paid from 10s. to 30s. per week and found, and for that wage they are expected to do any work on the farm. Good milkers are worth 20s. per week, and can



LOADING WOOL AT SHED.

get this, but they must be expert at the work. By day labour, 6s. per day is given. In working dairy farms, many owners work their farms with families—that is to say, all members of the family are called upon to do their share of the work. Wages in this case range from £8 to £16 per month, with house found, and the right to supply of milk and vegetables. This is, to my mind, a better method of working a farm than on the share system, as there is less risk of carelessness. The share system referred to is a plan of giving those working the dairy a percentage or allowing half the proceeds monthly, and paying an agreed amount, up to 10s. per head, for all the calves reared. All work is done by the family, such as milking, feeding calves, separating, feeding pigs, ploughing, sowing, harvesting, fencing, building, repairs, and any work of the nature of farm labour.



CARTING HAY.

To stock a dairy farm of 100 acres, I should estimate the detailed cost of what I consider necessary to make a good start, exclusive of a bull, as follows :—

	£	s.	d.
30 cows, @ £6 10s.	195	0	0
10 heifers, springing, @ £5	50	0	0
2 plough horses, @ £18	36	0	0
Harness for plough horses	6	10	0
Pigs—two sows, @ £2 2s. ; one hog, @ £3 3s.	7	7	0
Separator, eans, buckets, &c.	40	0	0
Cart and harness	18	0	0
Plough, £4 10s. ; harrow, £3 ; cultivator, £2 10s.	10	0	0
Sundry tools, &c.	5	0	0
	<hr/>		
	£367	17	0

Including the bull, the cost might roughly be put down at £400.

200 acres of Mr. McKeown gives the figures for plant and stock for the cultivation
Wheat. of 200 acres of cereals as follows :—

6 horses	£120 to £150
6 sets of harness	15
1 large dray	18
1 set harness	4
1 disc plough (or 4-furrow mould-board, £26)	35
1 set harrows, 4-leaf (heavy)	10
1 roller (if required)	4
1 seed drill	38
1 reaper and binder for hay or grain	38
Small tools	5
*1 spring cart (large)	18
Harness for large spring cart	4
	<hr/>
	£309 to £339

Even if the farmer harvest with a stripper, a reaper and binder will be necessary for haymaking. The plant, in the event of a stripper being preferred, would be increased by £54

for a stripper and £35 for a winnower.

In some districts threshing machines are available to complete by contract the work of the reaper and binder, at prices ranging from 12s. to 25s. per 100 bushels. Few, however, are available in this (Wagga) district, where most farmers use strippers. Contractors are also available for this work as well as for ploughing, chaffcutting, and other

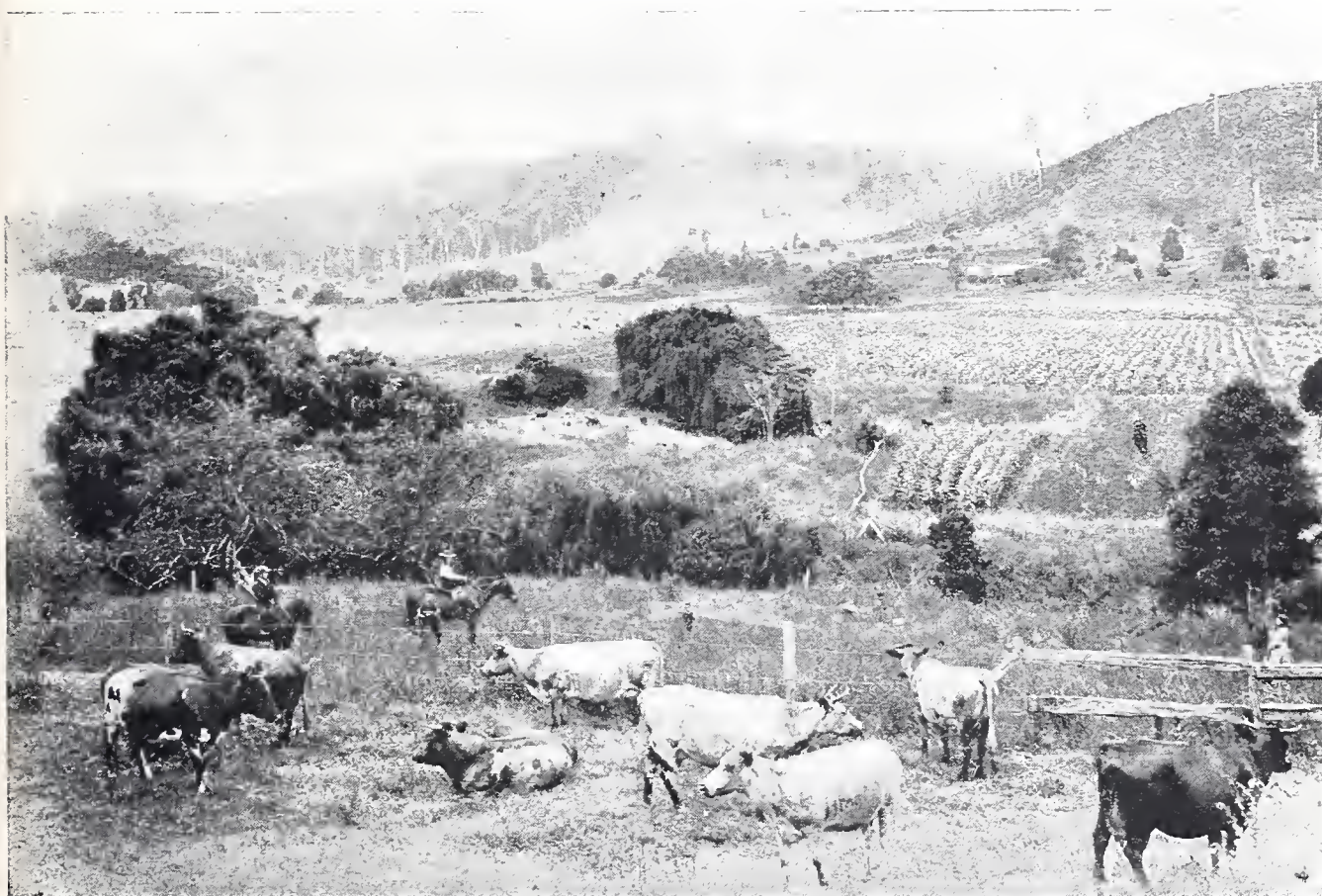


SCENE ON THE SNOWY MOUNTAINS.

operations, thus making it possible to reduce the outlay when starting operations, if so desired.

* Not absolutely necessary at start.

The capacity of some of the implements is, of course, greater than the area quoted. The work of preparing land in the sowing season is relieved considerably by fallowing land in the winter or early spring between the sowing and harvesting seasons. For this work, however, a mouldboard plough is necessary, the price of a double furrow implement being about £16 and that of a four-furrow about £26. In this case a scarifier, costing about £12, is desirable for preparing the fallowed land in the autumn. For ploughing dry stubble land the disc plough is the best implement, and it may also be used finally to prepare the fallow. Its work is more economical than that of the mouldboards.



A SCENE ON THE RICHMOND RIVER.

The cost of procuring livestock will naturally vary with the resources and requirements of the settler. Horses, which are included in the working plant, are at present high in price, the quotations not being the highest ruling rates.

Ewes of a good class for breeding lambs for mutton are worth from 11s. to 14s. each, according to quality. Shropshire flock rams are worth £4 to £5 each. Dairy cows are worth from £6 to £10 per head for fair stock, but others may be purchased at lower rates.

The cost of dairy utensils and plant will naturally vary with conditions, as a couple of pounds will cover the cost of requirements for supplying the home only.

For the shearing of a small flock of sheep, temporary arrangements may be made by using a shed or outhouse forming part of the farm buildings.

Mr. Peacock discusses the difference between English and Australian conditions. He says :—The Australian system of farming differs from the English system in not being so intense. The Australian has operated up to the present with practically unlimited areas of virgin soil, and the necessity for intensive and scientific culture naturally has, therefore, not been forced upon him to the same extent as upon the British farmer. The British practice, with modifications, could be successfully followed in Australia, and upon many areas, contiguous to market and large centres of population, it is the only system by which the land can be put to its best use.

Instead of it being necessary to make provision for a long cold winter as in England, the dry summers of Australia demand that provision be made for them. Generally speaking, stock can be carried through the ordinary Australian winter without artificial feeding, and very little attention. The dry seasons which sometimes occur demand that the stock-owner make provision if he wishes to save his flocks.

The farmer has not to struggle with an excess of moisture as is often the case in England, but must contrive by all means in his power to conserve in the soil the water given him in the rainfall by thorough and frequent cultivations. Bare fallow in England may be attended by a serious loss of plant food by leaching. In Australia it is attended by excellent results, owing to the retention of soil moisture. Many crops which under English conditions are used extensively in farm practice do not succeed as well under Australian methods, and others more suitable must be grown in their place to fit in with the same principles underlying successful agriculture.



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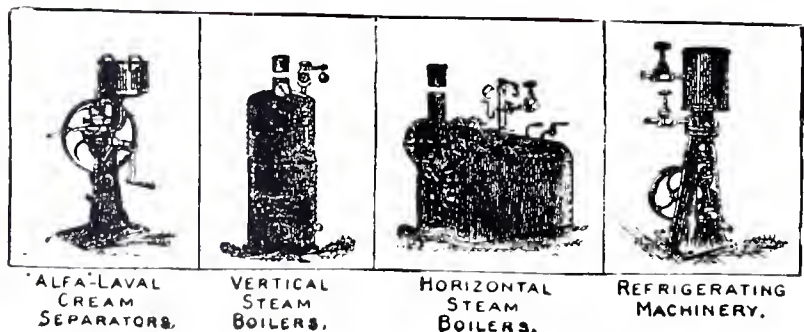
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CAPACITY	HAND MACHINES.		STEAM TURBINE MACHINES.		BELT POWER MACHINES.	
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	17 gallons per hour ...	25 ditto ...	65 gallons per hour ...	110 ditto ...	150 gallons per hour	300 ditto
	45 ditto ...	55 ditto ...	150 ditto ...	300 ditto	440 ditto	
	65 ditto ...	100 ditto	440 ditto			

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CHAPTER XVI.

Dairying.

Possibilities of the Export Trade—Causes of Increased Consumption—Competitors of the State—Results—Room for Development.

BY M. A. O'CALLAGHAN,

CHIEF DAIRY EXPERT, DEPARTMENT OF AGRICULTURE.



DAIRYING, as one of the national industries of Australia, might be said to have begun with the export of dairy produce to England. Hitherto the dairy farmer was the butt of local conditions. In a good season, butter was plentiful, and 4d. per lb. was considered an average price in spring and summer. This was in the seventies; but soon after, science came to the aid of the dairy farmer with the centrifugal separator and the refrigerator, thereby changing the

entire aspect of dairying, not alone in Australia, but in all other civilised countries.

To-day, dairying—that is, the production of milk for various purposes—stands out as the greatest industry connected with the soil throughout the world. If a man were asked casually to name the greatest productive rural industry in the world, he would probably reply wheat-growing, knowing that bread forms an important portion of the daily ration of both the rich and the poor. Let us analyse the subject a little. In 1903, Coghlan estimated the world's wheat production at 389,350,000 quarters. The average price (Coghlan) per quarter in London that year was 26s. 9d. This gives a total money value of £520,755,625. Huge figures, but huger still are those of the dairying industry. Including Europe, America, Australasia, and Africa, the total value of the milk raised from dairy cows I estimate as having been not less than £524,500,000 in 1903. This leaves out Asia. Reliable statistics of values or quantities from Asiatic sources are not procurable; but we know that India recorded 20,822,834 cows in 1903, apart from buffaloes, and Siberia, a country of great promise, was stated to possess 4,946,800 cattle. Then, of course, milk and butter (of a kind) are used and produced throughout all other parts of Asia, even in Thibet. The Asiatic figures, if available, would, therefore, swell the bill very considerably; but it is, as given, sufficiently large to demonstrate the importance of the dairying industry to the world as a whole.

Before proceeding further, it will be well to trace the growth of the imports of dairy products into the

United Kingdom. From 1861 to 1865, the average annual value of the total imports of dairy products was £7,134,929. From 1866 to 1870, the average was £9,230,954 per year.

From 1871 to 1875, the average was £11,420,650. From 1876 to 1880, the figures were £14,921,494, and from 1881 to 1885, the average was £16,410,864. From 1886 on, the figures are given in detail in the following table:—



YOUNG DAIRY STOCK.

Year.	Butter.		Margarine. Value.	Cheese. Value.	Total Value of all Dairy Products.
	Weight.	Value.			
	cwt.	£	£	£	£
1886	1,543,566	8,141,438	2,962,264	3,871,359	14,975,061
1887	1,513,134	8,010,374	3,880,327	4,514,382	16,405,083
1888	1,671,433	8,913,045	3,268,313	4,546,408	17,462,442
1889	1,927,842	10,244,636	3,655,061	4,490,970	19,099,185
1890	2,027,717	10,598,848	3,083,241	4,975,134	19,505,798
1891	2,135,607	11,591,183	3,558,203	4,813,404	20,863,126
1892	2,183,009	11,965,190	3,712,884	5,416,784	22,025,167
1893	2,327,474	12,753,593	3,655,344	5,160,918	22,580,152
1894	2,574,835	13,456,699	3,044,810	5,474,940	23,077,203
1895	2,825,662	14,245,230	2,557,170	4,675,130	22,581,186
1896	3,037,718	15,344,364	2,498,425	4,900,342	23,919,690
1897	3,217,802	15,916,917	2,485,370	5,885,521	25,715,163
1898	3,209,153	15,961,783	2,384,384	4,970,242	24,778,980
1899	3,389,851	17,213,516	2,549,476	5,503,004	26,747,233
1900	3,378,516	17,450,435	2,464,825	6,837,883	28,543,988
1901	3,702,890	19,297,396	2,556,679	6,227,135	29,894,760
1902	3,974,933	20,526,690	2,569,503	6,412,002	31,354,617
1903	4,060,694	20,798,707	2,313,618	7,054,710	31,948,221
1904	4,241,005	21,117,162	2,494,467	5,843,770	31,096,056

Prior to 1886 the margarine figures were not separated from the butter returns, and hence only combined figures are available for the earlier periods. It is seen that since 1887 the imports of butter have shown a steady annual increase, with the exception of the year 1898, which, though of greater money value, was in actual quantity less than 1897; and the total imports of dairy produce have grown from about £7,000,000, in 1864, to £31,000,000 sterling in 1904.

The British imports of dairy products, as given, act, to a great extent, as an indicator of the world's progress in dairying. As the value of British imports increased, so the productive energy and enterprise of other countries grew, until a stage was reached when every commercial

nation strove for supremacy on the British butter markets. Later on some of these competitors, owing to many causes, had to turn their attention to the supply of butter for their own people, thus making room for new countries like Australia, the Argentina, and Siberia. The story of this development and change is, however, best told by the following figures :—

AMOUNTS supplied to the United Kingdom, in cwt., in the following years ;—

Countries supplying—										1904.	1900.
Denmark	..	..	..	..	..	..	..	..	..	1,708,619	1,486,342
Australia	..	..	..	..	..	..	..	..	..	480,778	353,157
Russia	..	..	..	..	..	..	..	..	..	404,717	209,738
France	..	..	..	..	..	..	..	..	..	371,061	322,048
New Zealand	..	..	..	..	..	..	..	..	..	294,982	163,871
Canada	..	..	..	..	..	..	..	..	..	268,607	138,313
Holland	..	..	..	..	..	..	..	..	..	252,262	282,805
Sweden	..	..	..	..	..	..	..	..	..	206,791	196,041
Argentina	..	..	..	..	..	..	..	..	..	82,568	27,098
United States of America	..	..	..	..	..	..	..	..	..	68,754	56,046
Belgium	..	..	..	..	..	..	..	..	..	65,191	78,771
Norway	..	..	..	..	..	..	..	..	..	28,532	26,085
Germany	..	..	..	..	..	..	..	..	..	4,080	36,042

Other countries that have sent butter to England, but only in small quantities, are :— Austria-Hungary, none since 1900 ; Brazil, none since 1900 ; Egypt, Iceland, and Greenland, a growing amount ; Italy, none since 1902 ; Spain, very small and irregular lots ; Uruguay, 563 cwt. in 1903 ; British East Indies, 1,417 cwt. in 1904 ; and a few other places in trifling lots.



A NORTH COAST DAIRY FARM.

**On the
Up-grade in
Exports.**

Australia, New Zealand, Canada, Argentina, and Russia (including Siberia) are all on the up grade, and are capable of immense expansion. Denmark has increased to an extraordinary extent, but there is evidence that it has practically reached its limit. The years 1902, 1903, and 1904 show the following figures :—1,703,032 cwt., 1,771,654 cwt., and 1,708,619 cwt. respectively. There is a sameness about these that suggest a probable limit to development.

Germany, Italy, and the United States of America are all on the down grade, so far as exports to Great Britain are concerned. France is practically at a standstill, with the tendency downwards; Holland and Belgium, Norway and Sweden are in the same position as France, and we might add Den-

mark. This is the *export* history to England, but this need not necessarily be any indicator to the history of *production* in the countries named, as the world's consumption of butter and milk has enormously increased during recent years.



Causes of Increased Consumption. Increase in the world's wealth; increase in the world's population; decrease in the average price of butter, causing a greater consumption per head; the manufacture of an improved article with greater facilities for preservation; greater facilities for trading by sea and land, with more favourable freights; a greater knowledge of the food value of milk and its products, with improved dairy hygiene; and a better control of the sale of butter substitutes, such as margarine.

Let us review these causes a little in detail :—

Increase in the world's wealth, and in population : These two might be grouped together. Countries like England, U.S.A., and Germany are daily growing in wealth and in population, especially in the population of their cities. Unlike bread, butter is more or less a luxury, and as a country increases in wealth there will be an increased consumption of butter, although the bread bill may not alter: this is one of the reasons why dairying should go on increasing as the world becomes gradually richer. Compare the wealth of the United States to-day with what it was twenty years ago. Millions of people living there, the descendants of immigrants, eat butter daily, who, had they been born and continued to live in overcrowded Europe, would have to be content with unbuttered bread. As the wealth and population of this great country goes on increasing, there is every probability that, instead of exporting dairy products to England, she will consume all she makes, and perhaps also provide a market for some Canadian butter and cheese.

Of all the countries mentioned, Germany presents the most interesting features. Twenty years ago she was a heavy exporter of butter to England.

Germany. Now the excess of butter imports over exports amounts to about 30,000 tons, equal to over £3,000,000 per year. This great change is due mainly to the fact that Germany has largely increased the wealth and population of her big towns. This means a greater attraction for the people to the cities, with a corresponding decrease in those left to carry on rural industries, resulting in higher wages to the agricultural labourer, and decreased profits on dairying. The increase in wealth also means an increased consumption of butter per head, due to the improved position of the people. These two items cause Germany to require all her dairy products for her own people, and instead of being a competitor of ours on the British markets there is every probability that she will at a future date be a large importer of Australian butter.

The Position of New South Wales. When science perfected refrigerating methods Australia's opportunity came, and from a small beginning by New South Wales in 1888, and by Victoria in 1890, the export trade of the Commonwealth has grown until now it has become a factor to be reckoned with, and almost every English house of note in the butter trade is beginning to realise that the Australian business is worth coming from London to inquire into. Australia is now well known on the chief British markets for dairy produce. The competition on these markets has become keener and keener, however, and the producing world stands to-day with the eyes of its intelligence officers centred on the movements of what might be considered the mouth of the world's greatest provision depôt, viz., London. In 1904 the butter imported into England from outside the British Isles was valued at £21,117,162. With such a prize as this up for competition it is apparent that strenuous efforts will be made by all butter-producing countries to capture a section of it.

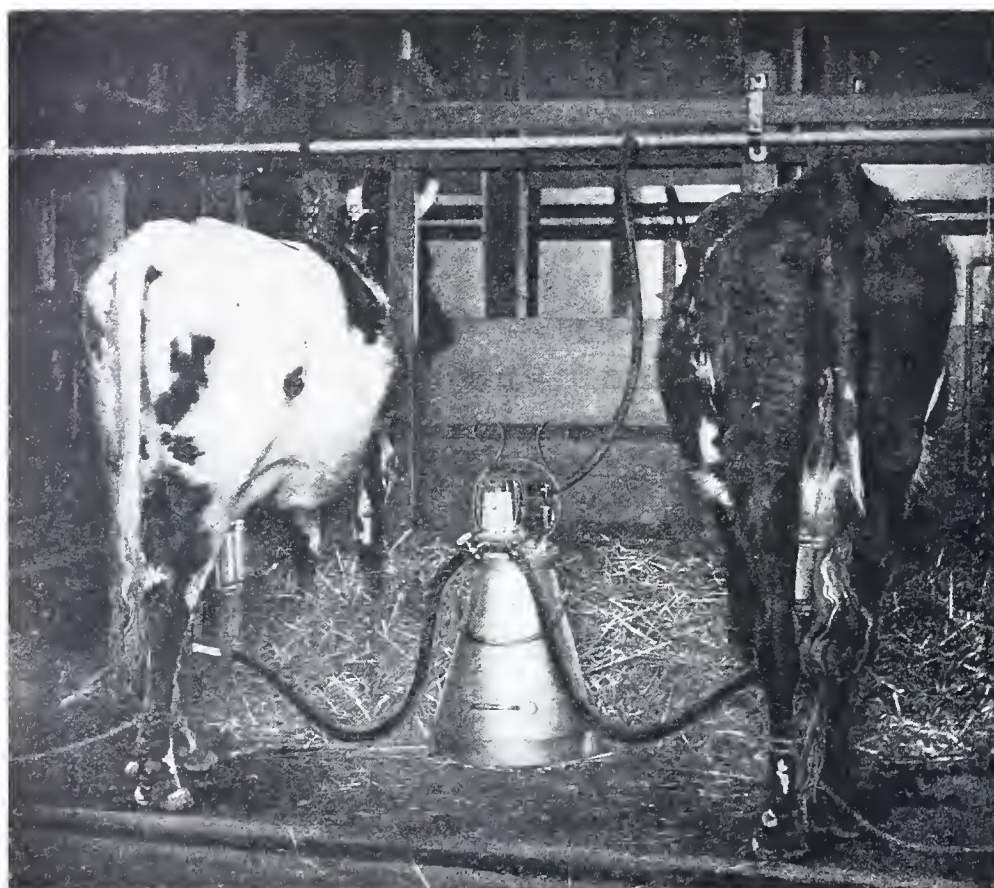


At present Denmark is easily first in the competition, having obtained £9,003,089 in 1904 for the butter it sent to England. Yet in 1886 the total value of the butter imported into England was but £8,141,438, or nearly a million less than what little Denmark sent last year. Ten years ago, in 1896, the figures were £15,344,364. That year New South Wales sent butter worth £102,502 to London, whereas for

the year ended June 30, 1905, this State sent about £772,060 worth of butter to England. Thus, in say ten years, our export, despite droughts, has increased more than sevenfold.

As far as quantity is concerned, therefore, our position has been greatly improved. As regards quality, it may be said that though there was a set back about three years ago, due to a change of methods on the part of the farmer, we are now on the up grade again, and our best factories turn out a butter very little if anything behind the best made in any part of the world.

Our weakness lies in the fact that we still manufacture a considerable quantity of butter that cannot rank as really first-class. This is unavoidable to some extent in a country where so many are new to the industry, but owing to the wretched cut-throat competition policy of many factories the desirable stimulus to improve does not exist. It is very little use telling a farmer his cream is only second quality if a competing factory is willing to pay him top price for it; and it is hopeless to endeavour to get him to improve his methods so long as this state of things exists. Thus, the ends of education are defeated, and the industry continues to carry an unnecessary and undesirable burden. The remedy lies in the universal grading of cream by standard methods; and the easiest way of bringing this about is to grade all butter. There are other ways, but this should prove the simplest.



MILKING COWS BY MACHINERY.

The development of the industry in the most northern parts of the State, viz., on the Richmond and Tweed Rivers, has been little short of phenomenal. **Room for Development.** There is still room in these districts for a great many more farmers, but the value of land has increased to such an extent, viz., up to £25 an acre, that eyes are being turned in other directions as well, and some of the country inland is receiving attention. Such centres as Mudgee, Inverell, Tamworth, Gunnedah, Orange, Cootamundra, and Tumut are being tried.

Two Strings to his Bow. Along the coast it is quite safe to carry on dairying alone. Except in very extraordinary years the rainfall will be sufficient to make the success of the industry a certainty; but when a farmer moves inland to where the rainfall

varies from, say, 27 to 30 inches per year, he has to think a bit more. In such districts the combination of dairying with wheat-growing, or mutton-raising, or both, might be entered into. Thus the farmer will have more than one string to his bow, and in a year too dry for profitable dairying he may get a very good crop of wheat, provided rain falls at opportune times. The same with mutton-raising, or rather the breeding of cross-bred lambs for export. This goes very well with dairying, the sheep being confined to the higher lands and drier pastures, while the milch cows are allowed the run of the most succulent foods and grasses. I have had considerable experience of this system, the Shropshire being used for crossing, and the presence of the sheep need not in any way interfere with the profits of the dairy cows. They can be run in the same paddocks as dry cattle. The farm, however, must be properly subdivided, and a fresh field or paddock provided for the milch cows as often as possible. There is in New South Wales any quantity of such land, where good farmers will always be able to make a fair living, but the greater portion of such lands are on large estates, which are at present used as sheep-walks, for wool-raising, and give regular employment to only a comparatively small number of people. It is only now that New South Wales is recognising the value of the farmer, and that large landowners are realising the fact that the time has come when farmers are more valuable to the State than sheep or bullocks. The dawn of agriculture has broken, and closer settlement is destined to follow. Already many large estates are being voluntarily subdivided, and, in addition, the Government of this State has resumed a large area for the settlement thereon of agricultural families on easy terms. A great deal of this land, in fact almost all that has been cut up, is suitable for dairying and mixed farming, and thus is ensured, with fair seasons, a very large development in the dairying industry. Land similar to what in this State can be bought for about £5 per acre is let in England and Ireland for about £1 per year rent, and yet butter is almost as dear, or as valuable to the farmer, in New South Wales as it is in Ireland. Good farming and good cattle alone are necessary to ensure an almost equal revenue from the land.



Improvements in Transit. With inferior transit arrangements no country can become great in the butter world. Butter is a substance that spoils easily and rapidly, and unless the carrying arrangements are such as will prevent its exposure to weather influences (mainly heat), there is little chance of the manufacturer presenting a really first-class article for sale at any distance from the factory. Condition of package is also an important factor affecting sale, and unless the vehicles for carrying, as well as the methods of transfer, are first-class, the packages will suffer, and will often be both unclean

and broken. Regularity of arrival is also a necessity. Superior transit arrangements, with regular deliveries, went a long way towards establishing the Danish and French butter trades in the secure positions they now enjoy on the London market. The Irish trade, on the contrary, at one time suffered because of imperfect methods of transfer and transport.

Russia has built up her Siberian butter business greatly by the aid of the very special arrangements made for the transit of the butter by rail and sea right through to England. Canada has also greatly improved her butter position in the same way. Australia has improved very considerably, and, as far as the transit arrangements to London by the best lines are concerned, the new conditions and lower freights are almost all that can be desired. The carrying temperature has been guaranteed to be below 20 degrees F., and the value of this improvement cannot readily be estimated. Better still would be a temperature of 10 degrees F., and this may come in time.

Locally, however, a good deal remains to be done.

It should be a generally accepted rule that butter should not be carried by rail or sea during the months of October, November, December, January, February, or March, unless in specially refrigerated vehicles. The vehicles of transfer from rail or boat to store, and *vice versa*, should also be of special construction, to prevent weather influences affecting the condition of the butter or packages.



HERD OF DAIRY CATTLE.

The coastal shipping companies and the Railway Commissioners in New South Wales are all improving matters in connection with the temperature of the carrying vehicles, but much remains to be done, especially from a railway point of view. It is to be hoped the growing importance of the industry will impress itself on all concerned, and that we shall not rest satisfied until our carrying conditions are equal to those in any other part of the world.



The Governments of all countries engaged in dairying have singled out **Government** this industry for particular assistance. There are many reasons for this.

Aid. First, the great income which the world derives from the industry. Second, the realisation of the fact that, though the production of milk and butter are as old as man's records, yet the industry is almost new in its present form, and, therefore, education to correct old and erroneous ideas is a necessity to progress. Third, if one Government assists this industry until all the principals concerned are capable of dealing with its various phases with the accuracy of a science, it follows as a matter of course that unless other countries are content to get knocked out of the competition either their Governments or private benefactors must find the means to provide similar necessary instruction. Denmark probably led the way in thorough and organised Government effort, and met the well-known reward. Every other country has since followed, but some have followed only partly and slowly. In the Southern Hemisphere the New Zealand Government has made the most advanced and sustained effort, backing up their instruction by an educational Dairy Industry Act, and their work has been crowned with success. New South Wales has also done a good deal by systematic dairy inspection, by itinerary instruction, by education in State agricultural institutions, and by the supplying to farmers of thorough-bred dairy bulls of various breeds and of undoubted milking strains.

Though in most countries the pioneer work in factory dairying was done **Co-operative** by private individuals, most of whom had landed interests in the districts, yet to-day co-operative effort on the part of the farmers is almost everywhere **Dairying.** carrying the standard of progress. Here, again, the Danes were first, Ireland followed, and now every country of note in dairying is advancing along co-operative lines, at least as far as production is concerned. This system, with good management, secures to the producers all the profit possible to be derived from their products.

New South Wales has made great advances in co-operative dairying in recent years, and we have in this State, perhaps, one of the largest productive co-operative institutions in the world. It is a very healthy sign of the industry when farmers are found willing to subscribe money to build these co-operative factories wherever suitable. Many of these deal not only with butter, but with bacon manufacture also.

Although there never has been any question as to the purity of the supply of butter from New South Wales, and from Australia generally, yet this burning question of butter adulteration affects us very materially, and it is a great pity that the British Parliament has not yet seen its way to pass into law the much-talked-of Butter Bill, to prevent, or at least curb, the wholesale adulteration of butter. A great deal of the unsalted butter sent from Australia this year has unquestionably been used as a medium for adulteration, both in England and on the continent of Europe. It is a questionable policy whether it pays to cater for this demand at all. In the first place, the farthing per lb. extra offered for unsalted little more than covers the loss in weight, as against salted butter; and in the second place, it means that instead of daily creating a better demand from legitimate sellers of Australian butter, a great portion of our very best butter is passed off under some other name; and when this spurious trade is checked, as it undoubtedly will be by the Imperial Parliament, where shall we find that the necessary legitimate trade in our butter has gone? To some country that has not catered for the "butter fakers." The question thus arises: Does it pay Australia and New Zealand to ship *unsalted* butter to England? Certain it is, however, that our butter interests want very careful watching now in England, and special trade inspectors, with power to institute prosecutions, appear a necessity, if the fair name and reputation for purity which Australian butter has gained is not to be sacrificed. Denmark has always maintained a watchful eye on her British butter trade, and, as a consequence, adulterated butter is rarely sold as Danish. Australian factories should all trade under a registered brand, and then, even though it is not at present illegal to mix casein with butter, the mixture could not legally be sold under the brand of an Australian factory. The same would, of course, apply to a Government grade or registered brand, if all butter was branded before export. Of very recent years, perhaps, Holland has made the greatest European advance in protecting the purity of its creamery butter: The Government has established control stations, where the butter is examined regularly, and all factories thus controlled are allowed to use a special state brand guaranteeing the purity of the product. Something similar might be advisable in New South Wales at this juncture. It could be so arranged that the box once emptied could never be filled with butter carrying the Government guarantee brand of purity.

Although at present there is no special supervision of butter exports, it must not be forgotten that all the milk, butter, and cheese raised in this State are produced under the inspection of State officials, and that all cows are regularly examined from a health point of view. The dairy industry is now established

on a firm basis in New South Wales. To make it great there only remains the necessity of ensuring that every man's hand that touches it shall be clean, that the watchword of all shall be quality, and that education shall be progressive and sufficient.





HOME OF A PIONEER SETTLER.

PITT, SON, & BADGERY, LTD.

The Most PROGRESSIVE Salesmen

. . . for . . .

STOCK, WOOL, AND PRODUCE.

— Selling Agents only. —

© THE WISE MAN JUDGES BY **RESULTS.**

MARK THIS:

Our 1905 Sales were—

SHEEP, 499,648

CATTLE, 27,481, being

25% AHEAD of any other Agents.

We possess the only available water adjoining the Flemington Sale-yards.

We obtain **TOP PRICES** at every Sale of HIDES, SHEEP-SKINS, TALLOW, LEATHER, BARK, MARSUPIAL SKINS, &c., **PIGS** and **CALVES**. Our Experience, Facilities, and Attention place us **RIGHT ON TOP**, as we pay equal attention to all consignments, large or small.

WOOL.

Our NEW PALACE STORES, aggregating

FOUR AND A HALF ACRES

floor space, with an unrivalled SHOWROOM, will await the coming Clip.

Last Year's Increase, **8,564 Bales.**

Offices: 15, O'Connell-st.,
SYDNEY.

Stores: Wool: Pyrmont.
Produce: Circular Quay
and Macquarie-st.

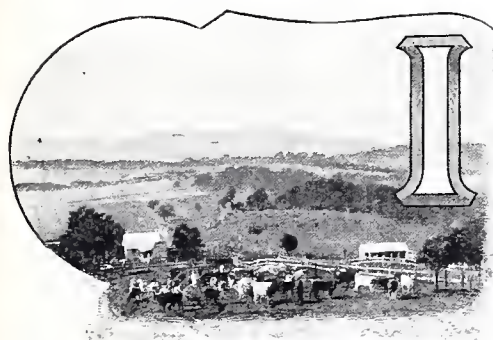
CHAPTER XVII.

Pig-raising.

Pork and Bacon making.

By H. W. POTTS,

PRINCIPAL, HAWKESBURY AGRICULTURAL COLLEGE.



It may safely be asserted that the natural conditions of climate, soil, and water supply in Australia are eminently favourable for the propagation of animal life in its highest and healthiest form. Our dry, pure, rarefied air, the constant presence of sunlight, and the scanty rainfall in the more remote inland districts, all combine to produce sweet forms of easily digested and nutritious natural herbage and grasses. These give an ideal and effective stimulus to the natural functions

for the production of wool, beef, milk, and pork to a degree unequalled in any other country. To these highly favourable natural advantages we may largely attribute the almost phenomenal freedom the domestic animal has from disease in this country.

With the steadily increasing trade in dairy products, it is fair to assume that the raising of pork must engage the attention of dairymen seeking to find a profitable means of utilising the most valuable of the dairy by-products. Increased attention to pigs is essential to a thriving dairy farm, apart from the remunerative position this form of stock-raising occupies on the general farm.

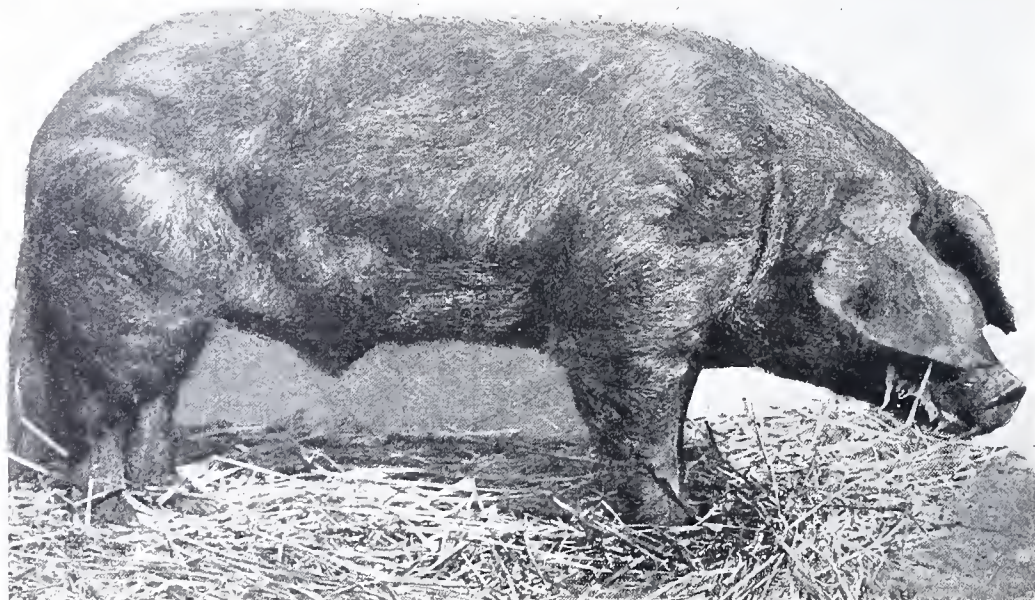
Organising the Trade. The trade in dealing with pigs and their products is becoming better organised, and hence more profitable. Already we have our combined co-operative butter and bacon factories clearly demonstrating year by year the possibilities arising from such businesslike organisations. The Danish example may be quoted to instance the success of such trading concerns.

In 1887 Germany closed her ports to live pigs from Denmark, to check the possible invasion of swine fever. Bacon factories on co-operative lines were established, the first of which commenced operations at Horsens in 1887. At the end of the year 23,407 pigs, valued at £57,000, were killed, and the average price paid to the farmer for each pig was £2 9s. The following year eight factories commenced operations, and in 1902, twenty-seven factories were in full swing. They dealt with 777,232 pigs, valued at £2,500,000, and the price per pig year by year had steadily increased in value, and in the year referred to reached £3 4s. 6d. The combined shareholders' list numbered 65,800.

In the fifteen years under review the number of pigs killed by these co-operative associations totalled 6,731,048, valued at £18,900,000. All the by-products can be turned to profitable account under such a system. Each shareholder or farmer enters into a bond to supply his factory with all pigs raised on the farm. A fine of 11s. 3d. per pig is imposed should this guarantee be infringed.

This excellent result has been fostered by the State in educating the farmer by demonstrating improved methods of feeding on a scientific basis, and by raising the quality of the pig by breeding and selection. It need scarcely be pointed out that natural conditions in New South Wales are vastly superior to those existing in such a country as Denmark. Their market is ours, viz., London; and the difference in expense attached to carriage to market may be equalised by the advantages we possess in climate, and larger areas of land. Our conditions enable us

**New South
Wales
Advantages.**



LARGE BLACK BOAR, HAWKESBURY AGRICULTURAL COLLEGE STUD.

to raise a greater variety of suitable feeds at a cheap rate. The cost of housing and attention is decidedly in our favour. The risk of embarking on an export trade and its expansion is practically minimised by the knowledge that a constantly increasing demand exists in England for bacon, hams, small pork, and by-products, such as lard. In ten years the value of imports into Great Britain has doubled.

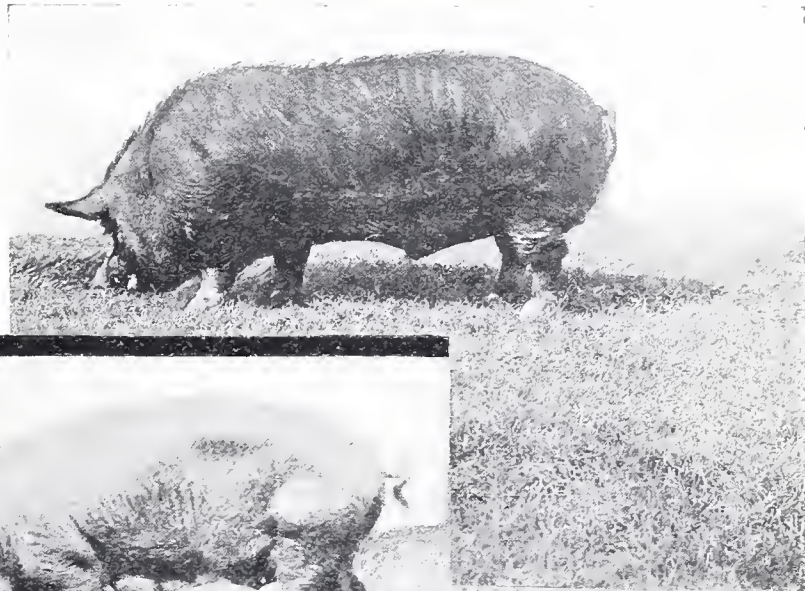
**Healthy
Export Trade
Possible.**

So long as the demand remains healthy (and there is no prospect of it being otherwise) the price available in Sydney will pay the producer. The local markets will be relieved, and, as with butter, steady market rates of a payable nature will be maintained. The first consideration to the exporter is the quantity and quality of the raw material; that to the farmer is the cost of producing the best class of pork, with the least possible waste, in the quickest time,

and at the lowest cost for feed and attention. Other things being equal, the best returns will be secured from pigs that consume the most food in proportion to their live weight.

The first aim of the pork-raiser is to work into a line or strain of breeding pigs possessing these important commercial qualifications. Well-bred pigs are essential to success. Breeding must be supplemented by suitable handling, intelligent care, sanitary housing, and good feeding. What should be aimed at are first the selection of a pedigreed boar, virile, sturdy, vigorous, prepotent, and of a type which will assist in begetting progeny—to produce a large amount of succulent tender meat of fine texture, strong bones, light offal, a good back, all round development of fore and hind quarters, quick maturers, prolific, clean in habit, of sturdy digestive capacity, good handling qualities, with a smooth scurfless skin, clean flexible hair, and power to resist disease. The breeds found most readily acclimatised in Australia are the Berkshire, Large Black, Tamworth, Large and Middle York, and Poland China.

Of late years size has not been accepted as a primary qualification. On the contrary, the demand is for quickly-maturing pigs, and for pork the dead weight may range from 60 lb. to 90 lb. Delicacy of flesh, well marbled and streaked, of fine texture, are points the buyers



REPRESENTATIVE BERKSHIRES.

regard of most value, and it is the aim of growers to provide these. The Berkshire and Middle White York breeds have most successfully competed in furnishing these qualities. To the farmer commencing business as a pork-raiser the first and most important feature is to select a well-bred boar from a reputable stud. With this object in view, the Government have



A YARD OF SUCKERS, HAWKESBURY AGRICULTURAL COLLEGE STUD.

established several large stud pig-herds in connection with the Hawkesbury Agricultural College, the Experimental Farms, and the Government Asylums; the herds at these establishments have been built up from the best imported stock obtainable in England, and are kept up by frequent importations of new blood; young boars are obtainable for a moderate sum. This animal exerts a marked influence in breeding upwards to a point of excellence, and to the condition most readily acceptable to the consumer. It is, therefore, of the greatest importance that the boar should be of the highest quality obtainable. In a very short time the influence of a good boar is manifest in the up-grading of the herd, the young pigs taking more of the characteristics of the sire than of the dam. The selection of the sow demands consideration, docility and motherly instincts standing first in her qualifications. See that she has good size through, fine quality of skin, is light in the forequarters, has broad and well let-down hams, broad hindquarters, large girth, strong back, short legs, well-formed udders, twelve or more teats, and is cleanly in habit. It is not a thrifty sign for a sow to fatten readily when breeding. As a rule her litters are starved and small in number.

Costly and stylish buildings or styes are not needed in our warm climate.

<p>Style</p> <p>of</p> <p>Buildings.</p>	<p>Shelter from rain and prevailing cold winds, and direct sunlight are required not only where the animals can sleep, but also feed and rest at intervals during the day. Care should be exercised in locating the feeding troughs, so that they can be readily moved and cleansed. The floors of the sleeping-shed or shelter-sheds should be constructed so that the drainage will get away freely and the floors can be kept clean. Wooden floors are</p>
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BALMORAL BEACH.

to be preferred to brick or cement. The back of the shed should be built to protect the animals from the prevailing winds, and the front so that sunlight may penetrate to every part of the shed for two or three hours daily.

**Pigs
want
Exercise.**

In every instance provision must be made for exercise. Clean water, suitable shelter, and free grazing are important factors in raising healthy stock. In general farming there is a constant supply of food from some section of the crops, as well as from the dairy and orchard, which may be profitably utilised in feeding pigs. They will eat foodstuffs that are practically useless for market purposes, and in many instances pigs are the means of converting otherwise useless waste products into excellent meat. This is where economy in pork-raising places the farmer on a sound footing. Where pig food has to be purchased the ledger has to be well kept and keenly scrutinised to maintain a profit. On the farm a great variety of food can be secured, and so long as it is palatable the change is noticeable in the increasing weight.



TAMWORTH SOW, HAWKESBURY AGRICULTURAL COLLEGE STUD.

**The
Bed-rock
of
Success.**

Grazing may be recognised as the bed-rock of success in pig-farming. The New South Wales climate and conditions favour this form of pig-feeding, not only for its food constituents, but for healthy digestive action, sunlight, and constant exercise. It may be roughly estimated that half the carcass can be grown on natural pasturage, more certainly, however, where stubbles and the wastes of crops and fodders can be gathered by the pigs. The cultivation of special fodder, grain and root crops for pigs, invariably ensures a good return, and in arranging farm crops, particularly in following a rotation, pigs and sheep are necessary adjuncts to its successful application in restoring soil fertility. We have not yet fully recognised the importance of rotating crops and using the domestic animals for eating some of them down.

The accompanying list will guide the farmer as to the crops available throughout the State. He should select those most readily grown under local conditions :—

FEEDING CALENDAR.

<i>January.</i> Rhodes grass. Couch grass. Paspalum dilatatum. Sheep's burnet. Lucerne. Cowpea. Soy bean. Maize. Millet. Sorghums. Sweet potatoes. Pumpkins. Potatoes.	<i>February.</i> Rhodes grass. Love grass. Couch grass. Paspalum. Sheep's burnet. Lucerne. Cowpea. Soy bean. Maize. Millet. Sorghums. Sweet potatoes. Pumpkins.	<i>March.</i> Rhodes grass. Love grass. Couch grass. Paspalum. Sheep's burnet. Lucerne. Cowpea. Soy bean. Maize. Millet. Sorghums. Sweet potatoes. Pumpkins.	<i>April.</i> Rhodes grass. Love grass. Couch. Paspalum. Sheep's burnet. French or Soulla clover. Cowpea. Soy bean. Barley. Maize. Millet. Sorghums. Rape. Turnips. Sweet potatoes. Pumpkins.
<i>May.</i> Texas blue grass. Cocksfoot. Rye grass. Prairie grass. Couch grass. Paspalum. Sheep's burnet. French or Soulla clover. Lucerne. Field pea. Barley. Sorghums. Rape. Turnips. Sweet potatoes. Pumpkins.	<i>June.</i> Paspalum. Texas blue grass. Cocksfoot. Rye grass. Prairie grass. Sheep's burnet. French clover. Field pea. Turnips. Rye (emerald). Barley. Sorghums. Oats. Rape. Swedes. Artichokes. Sweet potatoes. Potatoes.	<i>July.</i> Texas blue grass. Cocksfoot. Rye grass. Prairie grass. Sheep's burnet. French clover. Turnips. Rye. Barley. Oats. Sorghums. Rape. Swedes. Artichokes. Sweet potatoes. Potatoes.	<i>August.</i> Texas blue grass. Cocksfoot. Rye grass. Prairie grass. Sheep's burnet. French clover. Crimson clover. Lucerne. Field pea. Rye. Barley. Oats. Rape. Kohl Rabi. Swedes. Turnips. Artichokes. Sweet potatoes. Potatoes.
<i>September.</i> Texas blue grass. Cocksfoot. Rye grass. Prairie grass. Couch grass. Paspalum. Sheep's burnet. French clover. Crimson clover. Lucerne. Field pea. Vetches. Rye. Barley. Oats. Rape. Kale. Kohl Rabi. Swedes. Turnips. Sweet potatoes.	<i>October.</i> Love grass. Texas blue grass. Cocksfoot. Rye grass. Prairie grass. Paspalum. Sheep's burnet. French clover. Lucerne. Vetches. Barley. Oats. Kale. Swedes. Turnips.	<i>November.</i> Rhodes grass. Love grass. Texas blue grass. Cocksfoot (first week). Rye grass (first week). Couch grass. Paspalum. French clover. Lucerne. Oats. Millet.	<i>December.</i> Rhodes grass. Love grass. Couch grass. Paspalum. Sheep's burnet. Lucerne. Cowpea. Maize. Millet. Sweet potatoes.





TYPE OF CYPRESS PINE AND BOX FOREST WESTERN SLOPES.

CROPS TO GROW.

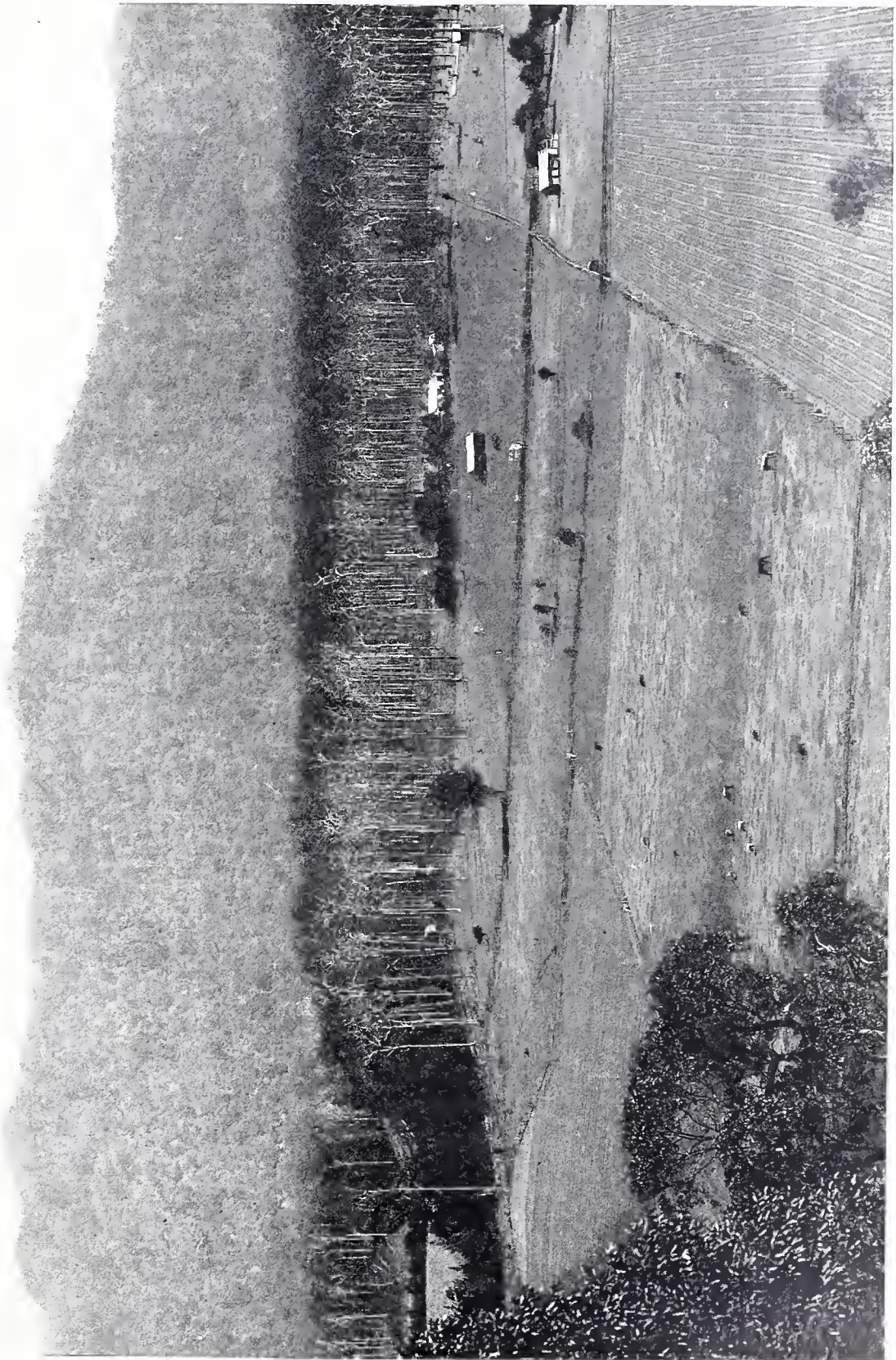
<i>Spring planting.</i>	<i>Summer planting.</i>	<i>Autumn planting.</i>	<i>Winter planting.</i>
Sugar beets.	Maize.	Kale.	Potatoes.
Maize.	Sorghum.	Kohl Rabi.	Oats.
Cowpeas.	Field peas.	Cattle cabbage.	Peas.
Mangolds.	Turnips.	Rape.	Wheat for green feed.
Sweet potatoes.	Millets.	Vetches.	
Artichokes.		Barley.	
Lucerne.		Lucerne.	
Pumpkins and squashes.		Oats.	
Melons.		Grasses.	
Ground nuts.		Wheat for grain.	

Name of Crop.

<i>Name of Crop.</i>	<i>When available.</i>
Artichokes	July to August.
Barley	April to October.
Cattle cabbage	August and September.
Cocksfoot	May to October.
Couch grass	September to June.
Cowpea.....	December to April.
Crimson clover	August and September.
Field pea	May to September.
French clover	April to November.
Kale	September to October.
Kohl Rabi	August and September.
Linseed.....	Grain, if stored, throughout the year.
Love grass, <i>Eragrostis pilosa</i>	October to April.
Lucerne	August to May.
Maize	December to April.
Millet	November to April.
Oats	July to November.
Paspalum	September to June.
Potatoes	January to June.
Prairie grass	May to November.
Pumpkins.....	January to June.
Rape	April to September.
Rye	June to September.
Rye grass.....	May to October.
Sheep's burnet	January to December.
Sorghum	January to July.
Soy bean	January to April.
Swedes	June to October.
Sweet potatoes	December to September.
Texas blue grass.....	May to November.
Turnips	April to October.
Vetches	September and October.

In addition to these, pollard, bran, ricemeal, oatbran, and other mill products are available, as well as the cakes such as copra, linseed, and cotton. The by-products from canning factories, abattoirs, breweries, distilleries, public institutions, hotels, butter-milk from butter factories, and whey from cheese factories can all be included in the dietary of the pig.

The dairy farmer has a constant supply of skim milk; it forms the basis of a profitable ration, being a good flesh-former in itself, and it renders other fattening material such as grain, pollard, and other carbonaceous foods more digestible. It has been shown that 10 gallons of skim milk will produce 5 lb. of pork, and 1 bushel of maize will produce 10 lb. pork, but when fed together the result was 18 lb. meat; pigs hence make greater gains on a judicious mixture of grain and skim milk. The Danes obtain the best results with barley and skim milk. The best gains have been made with barley, skim milk, and potatoes.



FARMING ON THE DORRIGO, NORTH COAST DISTRICT.

SPECIAL NOTICE

. . . TO . . .
Dairymen, Farmers, and All Men on the Land.

SUPPORT YOUR OWN SELLING AGENCY.

THE FARMERS' & SETTLERS' CO-OPERATIVE SOCIETY, Ltd.

343-345, SUSSEX-STREET.

SUBSCRIBED CAPITAL—£48,000.

ANNUAL TURNOVER—£600,000.

The Largest Butter & Dairy Produce Emporium in N.S.W.

**With Branches at ORANGE, BLAYNEY, GOULBURN,
WOLLONGONG, and PENNANT HILLS.**

Special Inducements to Market your Produce through us . .

We know how to Handle it to your advantage.
Expert Salesmen in each Department.
Special Supervision by Responsible Officers.
Make up your mind to do the correct thing and adopt Co-operative Marketing.
We are on the road to **SUCCESS** and Our **Success** means **Your Success**, so
we want to take you along with us.
We give **Free Storage for Wheat**—no Cartage Charges.
Liberal Advances made at Lowest Rate of Interest.
Highest Market Values Guaranteed and Prompt Returns.

LOWEST COMMISSIONS.

SALES BY AUCTION—

LIVE STOCK—at Homebush, Monday and Thursday, and
Corporation Yards, Tuesday, Wednesday, and Fridays.

**HAY, STRAW, CHAFF, &c.,
AT REDFERN YARDS DAILY.**

S. J. OXLEY,
General Manager.

CHAPTER XVIII.

Mixed Farming.

By G. M. McKEOWN,

MANAGER OF THE WAGGA WAGGA EXPERIMENT FARM.



PERHAPS the most general system of mixed farming, as the term is commonly understood, is sheep-raising and wheat production, but it will be at once appreciated that the great range of climate and varied soils of New South Wales make it possible for the farmer to extend these operations very materially, according to the district in which his holding is situated. There is dairying—to mention the most prominent of the other main lines of rural activity—and the dairyman is now gradually

pushing his way back from the coastal garden to the splendid but slightly drier areas of the tablelands, and even beyond to the edges of the Western slopes. As he goes inland the dairyman becomes acquainted with the mysteries and profits of mutton-raising, wool production, fruit-growing, and wheat, oats, and barley growing. This is giving rise to a somewhat extensive system of mixed farming, which is almost universally recommended as good for the farmer's pocket, and highly beneficial to the soil.

The mixed farmer must have fairly good land, and a reliable rainfall, and as these conditions obtain generally throughout the agricultural belt the practice will doubtless become the rule, except in those districts where on big estates wheat-growing is carried on on a mammoth scale to the exclusion of all other pursuits.

The system of mixed farming is based upon the rotation of the crops and stock found most suited to the conditions of a district. There are many crops from which to choose, and many lines of stock can be taken which are admirably adapted to New South Wales conditions. One of the first considerations upon a farm is a remunerative outlet for the products. In this connection the export trade must be looked to as offering a never-failing outlet for certain products at a price. The principal lines coming under this category are wool, mutton, wheat, butter, bacon, and fruits. There are many other avenues of local importance which are liable to serious fluctuations; but the lines mentioned are the most stable, and are worthy of the main attention of the settler.

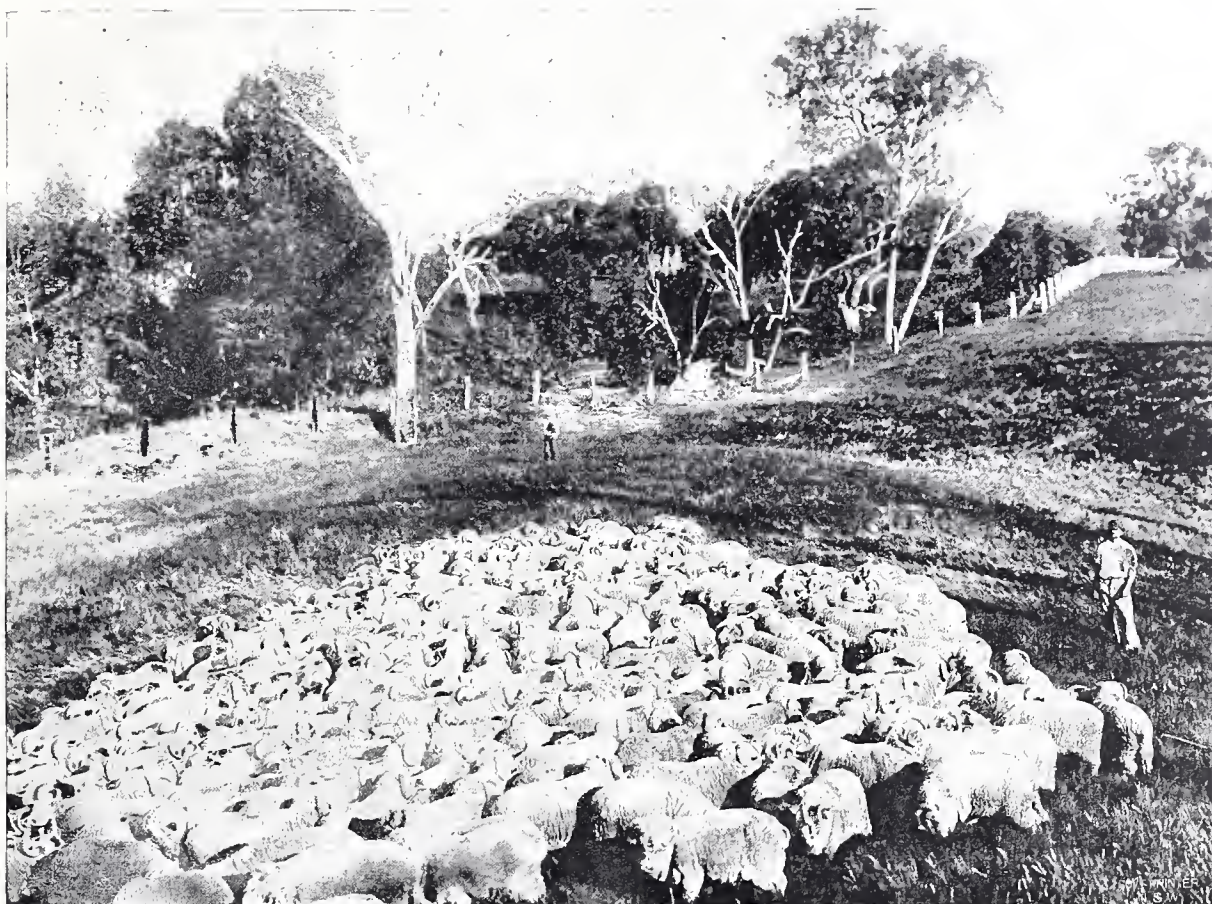
**Minimises
the Risk of
Failure.**

Mixed farming minimises the risk of complete failure, such as is incurred when everything is staked upon only one line of agriculture. It allows of monetary returns being received more often during the year, which means that many requirements can be purchased for cash. This is a distinct advantage. It provides for a rational division of labour for both men and teams throughout the year, which considerably relieves the monotony. By mixed farming, also, considerably larger returns can be obtained from a given area, and the soil fertility retained instead of being lost.

The practice up to the present has been to grow wheats and other cereals for a number of years, and when the returns have fallen so low, owing to the partial exhaustion of the soil, as to prove unremunerative, to devote the areas to stock, principally sheep. The vast area of virgin soils awaiting occupation has militated against the better management of many of the older agricultural districts, and a system of Arab farming has been encouraged which is not altogether in the best interests of the State. This has led to slipshod methods of speculative farming, which lacks thoroughness and stability, essentials in successful and progressive agriculture.



TURNING UP THE GROUND AT THE WAGGA FARM.



STUD RAMS, KINROSS.

More Intense Culture. When the large tracts of virgin country have been settled and put under the plough, more intense culture must be practised, and there are immense possibilities in the system of mixed farming which will eventually become universal along the agricultural belt. Comparatively small areas will under a more advanced system of agriculture yield larger returns than much larger areas were capable of producing under the old-time methods. Better provision will be made for periods of scarcity, and it is in this respect that the training of the British farmer will more than compensate for his initial lack of knowledge of Australian conditions, information upon which will be available to him from many sources.

Sheep-farming. Sheep-farming, as distinguished from sheep-grazing on the big stations in the West, is largely carried on already by wheat-growers, and is proving a valuable auxiliary to the cultivation of cereals. Recently the small holder has begun to turn his attention from the merino, grown almost solely for wool, to the British breeds, with an eye to the export of frozen mutton and lamb. The Shropshire and merino cross is one which will prove most profitable. The sheep are run on the stubble and cultivation paddocks not in use, and prove valuable cleansing and fertilising agents. The sheep rid the

wheat land of plants which afford good pasture, but which are objectionable in crops. They also perform very useful work in clearing stubbles of grain which has been shed at harvest time, thus converting into mutton and wool that which would otherwise be lost, and at the same time fertilising the land. As the general trend by small growers or mixed farmers is in the direction of producing a mutton sheep, particulars of demonstrations made at the Wagga Experimental Farm, which showed that this branch of the industry is the most profitable for small landholders, will prove of interest. The following figures show the earnings of a flock of Lincoln-merino ewes for 1905, the expenditure not including interest or rent of land :—

Receipts.

440 shorn lambs sold on farm (<i>less</i> commission)	...	...	...	£244	14	6
39 lambs on hand	...	...	...	22	16	0
Wool for exhibits	...	...	...	5	8	4
Sale of wool of ewes and lambs	...	...	...	209	13	9
				<hr/>		
				£482	12	7

Expenses.

Wages	...	...	...	£30	2	1
Freight (wool)	...	...	...	9	6	8
Packs, salt, rabbit poison, and sundries	...	...	...	7	5	6
				<hr/>		
				...	46	14 3
				<hr/>		
Net earnings	...	...	...	£435	18	4

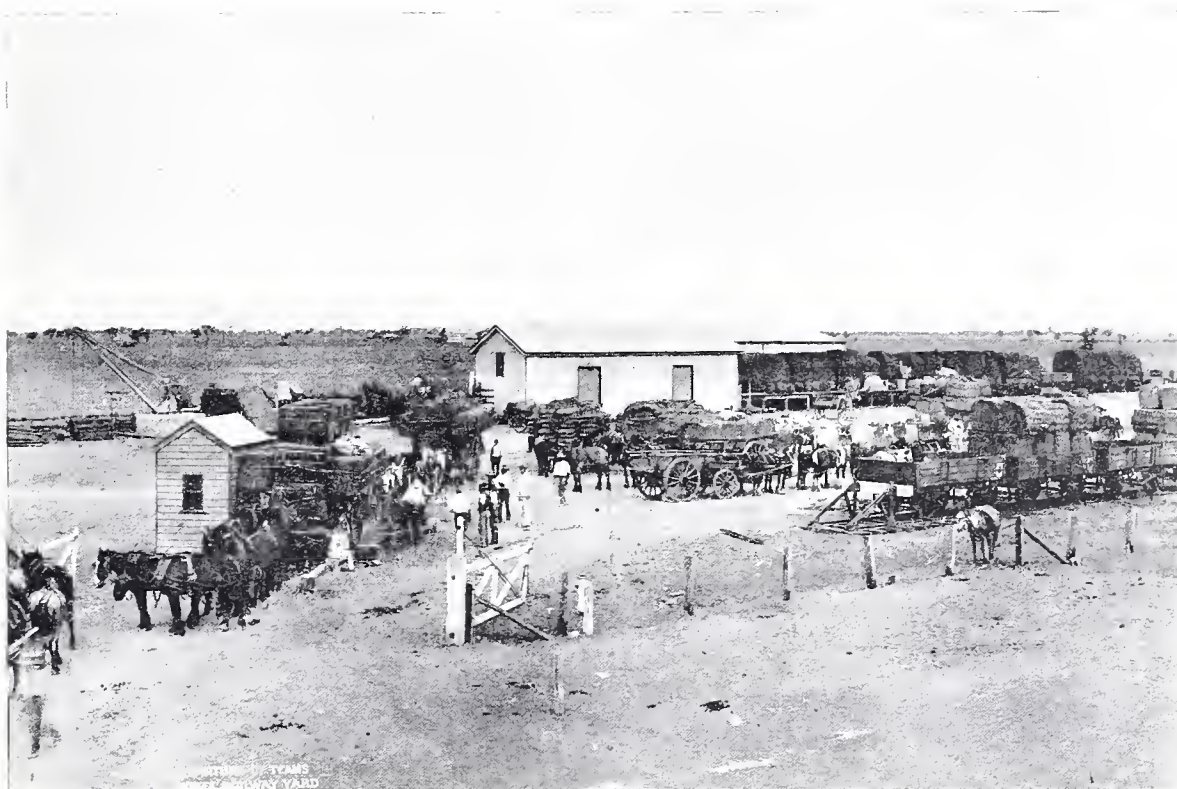
The rental value of the land would of course vary with the locality, stock-carrying capacity, and improvements; land values in the Wagga district, where the above-mentioned experiment took place, ranging between £2 10s. and £6 per acre. In ringbarked land, suitable for wheat-growing, the natural grasses will usually carry a sheep to the acre all the year round; but during portions of the year this may be considerably exceeded, and the writer has in a good season fed 1,400 sheep and lambs on 300 acres for four months. The land had been cultivated and



fertilised for wheat, and in alternate years had been allowed to grow grass. In land continuously cultivated, however, the grasses disappear, and they are not easily replaced. The grazing referred to was in the growing season, which usually ends in November, when the grass dries, and very little new growth takes place until March or April, when the seed of

the annual varieties germinates and the perennial kinds put forth new growth. The keeping of a flock of ewes according to the capacity of the farm, for the purpose of raising lambs for market, will be found to be profitable, the returns from this source making a very substantial addition to

the income derivable from wool. One of the best crosses for the purpose is made by mating Shropshire rams with Lincoln-merino cross-bred ewes. The best time for joining rams and ewes is about the middle of November, so as to provide for the lambing taking place at a time when fair pasture is usually available. This also admits of the lambs being old enough for market before the grass-seed has ripened, the seed usually being liable to prove a source of trouble. If it is desired to hold the lambs for sale to a later age, they should be shorn. The lambs are marketable at 4 to 5 months, and by selling them before the heat of summer sets in, the flock is greatly reduced in numbers, and the difficulty of maintaining the ewes is proportionately lessened.



MOREE RAILWAY YARD.

Dairying As a subsidiary industry, dairying, to some extent, may be carried on in suitable localities, but especial regard should be had to local markets, as the returns will naturally be affected by the local demand for dairy products.

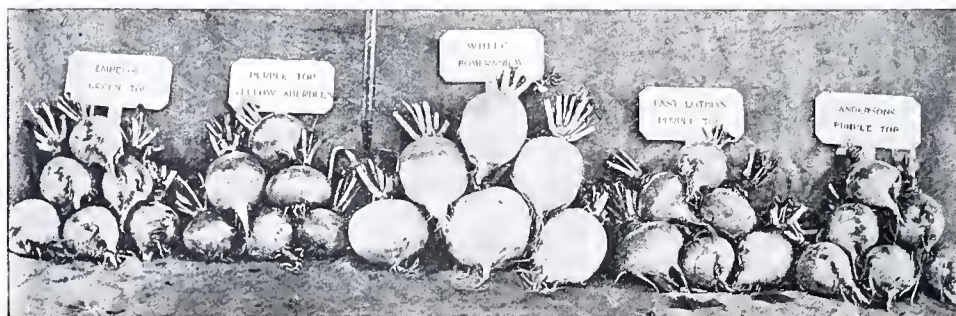
as an

Auxiliary. An essential feature in dairying requirements is a supply of pure water in all seasons, preferably obtained from running streams. Provision should also be made for the summer months by the conservation of fodder by means of ensilage, and such supplies may be provided in connection with cereal farming. The heaviest fodder crops are obtainable from varieties which may be sown in the autumn, and the best of these will be found to be barley with vetches or peas. With irrigation, heavy crops of maize and sorghum may be raised on the river flats, and fair crops of the latter may be grown on the higher lands

with the aid of fertilisers. One of the most suitable breeds will be found to be the Jerseys, as they have proved hardy under all conditions, as well as consistent yielders of milk of high quality.

In many districts the "mixed" farmer will grow oats and barley, as well as wheat. Barley grows to perfection in certain parts of the State, and the cultivation of this grain is a most profitable pursuit. Wheaten hay is largely used for fodder, and its cultivation and preparation for the Sydney markets form a lucrative branch of agriculture largely followed in Riverina and other farming districts. The crop is, under these circumstances, cut into chaff before being sold.

In addition to the other pursuits mentioned, there is fruit-growing, which affords another avenue of activity to the mixed farmer. The climate of New South Wales is so varied and the soils so diverse in character that there is hardly a district of the State in which some fruits cannot be grown with advantage. Fuller information upon this subject will be obtained from the chapter upon fruit-growing. It is only mentioned here as an illustration of the range of crops which the agriculturist who wishes to get the best results out of his land may command. There are properties in the Northern Rivers district where may be seen growing side-by-side fruits of various kinds, sugar-cane, maize, and root crops, while the main area of the holding is devoted to depasturing dairy cattle. In the Bathurst district and on the Northern and Southern tablelands are grown some of the best apples in the world, and there is a big future before the export trade of this fruit. And in Riverina the soil and climate are well suited for the growth of grapes, apricots, cherries, and plums, while some varieties of peaches, apples, pears, almonds, and walnuts thrive well. By a system of thorough cultivation, the settler can supply all his own requirements in these fruits, and it has been proved that a profitable industry may be established in Riverina in the production of raisins and other dried fruits. The farmer will also find it profitable to raise poultry, which can be done in conjunction with any other line of agricultural work. This matter is, however, dealt with fully in the chapter on poultry.



EXPERIMENTAL PLOTS.



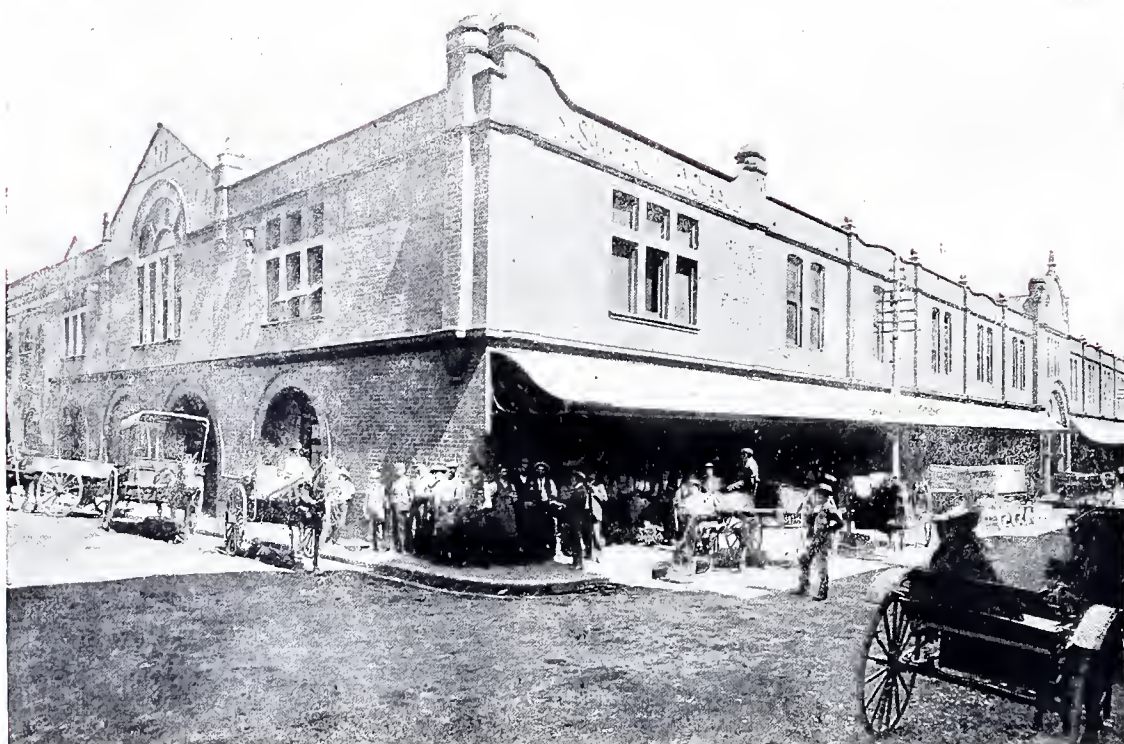
EVERGREEN FARM IN THE PEEL RIVER DISTRICT.

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Minsgrove, Thomas.
Allen, S. E.
Rule, W. J.
Gallard, Frank.
Montgomery, Henry.

Fruit-growing.

BY W. J. ALLEN,
GOVERNMENT FRUIT EXPERT.



FRUIT-GROWING finds profitable employment for thousands of people throughout New South Wales, where practically all kinds of fruit can be produced. It is easier to specify the varieties that cannot be grown than to enumerate the list of fruits which thrive in some portion or other of the vast territory of the State. In the different districts there is country ranging from an altitude of 7,300 feet down to the shores of the Pacific.

On the former heights snow lies for several months of the year, while in the coastal areas frosts are in many places of rare occurrence, even during the coldest months.

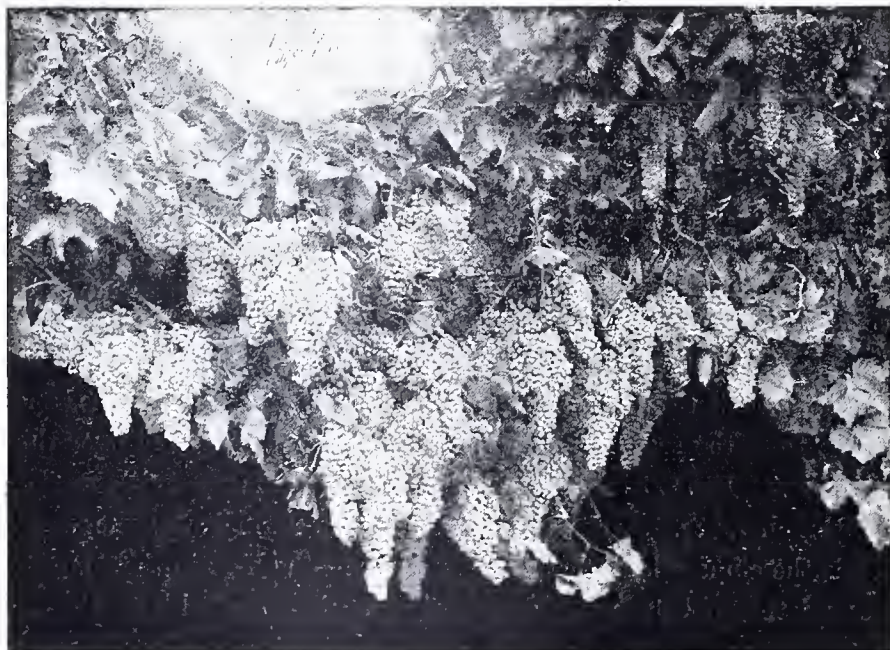
In several districts at an elevation of from 1,500 to 3,500 feet along the **English Fruits on the Tablelands.** tablelands, English fruits do as well as on their native soil. These tablelands stretch through the State parallel with the 500 miles coast line, and at a distance from the sea of from 20 to 150 miles. The rainfall over this area varies from 20 to 50 inches per annum, and orchards which receive proper cultivation, pruning, thinning, &c., carry good crops of fruit during even the worst season. On these higher levels the climate is all that can be desired—the heat in the summer seldom becoming oppressive and the cold days during the winter being few indeed. On the highest levels there are on rare occasions light falls of snow, which, however, usually disappear at once, or within a day or two. In this particular belt lies some of our best mixed farming country, where fruit-growing can be combined with dairying, cereal growing, and stock raising, and can be made a profitable adjunct to the latter industries.

Again, on our Northern Rivers, in close proximity to the coast, where dairying is the principal industry, pineapples, bananas, mangoes, paw-paws, passion, and citrus fruits can be grown in the more sheltered places, while throughout most of the coastal country, and up to an elevation of 1,500 feet, large quantities of peaches, plums, pears, apples, passion-fruit, citrus fruits, and grapes are cultivated. It is on this area that most of our fruit for local consumption is grown, as well as large quantities for the local jam factories and canneries.

The factories are now putting up immense quantities of the very best jams and fruits, which find ready sale, not only in New South Wales but in neighbouring States and other countries. There is no practical reason why these industries should not go on extending, as we can grow as good peaches, plums, and similar fruits in quantities, as can be produced anywhere in the world.

The local fruit trade alone is of considerable magnitude, as although fruit **Good Demand for Fruit.** could be grown in almost every garden in New South Wales there are few residents of the city who have sufficient ground to spare for fruit-trees; indeed there are many farmers who do not grow the fruit necessary for their own requirements, and, consequently, there is always a large demand for fruit of good quality, which usually commands a fair price.

In the spring-time, when the trees are coming into bloom, there is nothing more enjoyable than a drive through some of the fruit-growing districts, where on every side one sees



THOMPSON'S SEEDLESS SULTANA, WAGGA EXPERIMENTAL FARM.

thousands of trees in bloom, while the air is filled with the most fragrant perfumes of orange and other blossoms. Then again, later, when the fruit is ripe on the trees, what is more grateful to the eye than an orchard heavily laden, with limbs bending out under their burden of beautiful ripe fruit? When the fruit is gathered the work of careful picking, grading, and packing begins. The fruit is

handled like eggs and packed in cases, each of which contains carefully graded fruit, so arranged in layers that when the box is full and ready to be nailed down, preparatory to being forwarded to market, it presents a beautiful picture. Next comes the carting to the railway station and loading into trucks, where, at some of our larger fruit-growing centres, you will meet dozens of other growers with their loads of fruit.

After the fruit is landed in the city or town to which it is consigned, it has to be taken from the trucks to the fruit-market where it is displayed. When sold it still

has to make two or three other trips before finally reaching the table of the consumer, and one often wonders how it stands all this handling.

To make fruit-growing a profitable industry there are a good many things to be attended to. To begin with, the grower requires to see that he plants nothing but those varieties which find the greatest favour with the consumer, and which carry good crops of fruit every year.

When once he has decided what to plant he must see that the trees receive careful attention, and that the spraying, pruning, thinning, cultivation, destruction of insect pests, and marketing are all done on the most up-to-date lines.



FORTY-TWO YEAR OLD SEEDLING ORANGE-TREE.

My previous remarks apply chiefly to those fruits grown for local consumption, which is an industry of considerable importance; but there are great possibilities in the export trade, not only in fresh but in dried fruits also.

At the present time a few citrus and stone fruits are being exported to other States, with perhaps a few apples from orchards so situated that they find it more convenient to send their fruit to either Brisbane or Melbourne rather than to Sydney; and many districts which produce fruit earlier than can be done in some of the adjoining States send their crops to outside markets, where it usually finds ready sale at remunerative prices.

Of oranges and lemons we produce great quantities, and export largely to New Zealand, Tasmania, Victoria, and other States. We have not, however, succeeded in profitably landing large quantities on the English market; but with better cold storage facilities on the steamers, there is no reason why we should not be able to supply the English market with oranges, in hundreds of thousands of cases, if there was a demand for such fruit in August and September of every year.

Passion-fruit is another variety which can be grown to perfection in this State, and if, with improved facilities on the boats, we could succeed in landing this fruit on the London market, the demand, when it became known, would, I believe, be unlimited. This latter fruit does particularly well on the poorer light soils, in districts where frosts are not severe.

Take again the apple trade: there are thousands of acres of land in the cooler climates admirably adapted to the culture of the very best apples, which, if grown in quantities, should prove profitable for exporting after the local demand was supplied. At present, though, in place of being exporters of this fruit, we are importing annually about 500,000 cases. There is, therefore, a big opening for those who wish to grow apples, as they will find a ready market locally for years to come.



BUNCH OF LISBON LEMONS GROWN IN N.S.W.

On the western slopes lying at the back of the mountain ranges can be found some of the best land in Australia for the production of fruits for canning and drying purposes, and for citrus fruits more suitable than the coastal grown varieties for export.

Among those which are the most suitable for drying are the following :—

**A Great
Dried-Fruit
Trade.**

Raisin grapes, sultanas, Zante currants, figs, peaches, apricots, the latter three varieties being suitable for canning and jam-making as well. Locally canned fruits are stated by experts to be the best on the world's markets.

Although a good distance from the coast, the elevation is only about 500 feet above sea level. Here the summers are warmer and the bright sunny days are just what is required for the successful growing of such fruits, which require the higher temperature to dry them in order to turn out a first-class article. These fruits, when ripe, are picked and placed on clean wooden trays until dry, and are never allowed to touch the ground, as are many of the imported fruits, in which are frequently found small pebbles, soil, and other foreign ingredients. Our fruit is, therefore, clean and wholesome, and this to the ordinary Britisher should be its strongest recommendation. There is room and to spare for thousands of people to grow such fruits for drying, and where a good many are engaged at this work within a small area it is quite easy for them to combine in the packing, grading, and marketing of their fruit, thus enabling them to handle it at a minimum cost both at home and abroad. If a man has the inclination, he may, with every chance of success, enter into this industry, and, if he feel so inclined he may take up mixed farming as well.

Australian dried fruits are fast ousting the



ORANGE-TREE.



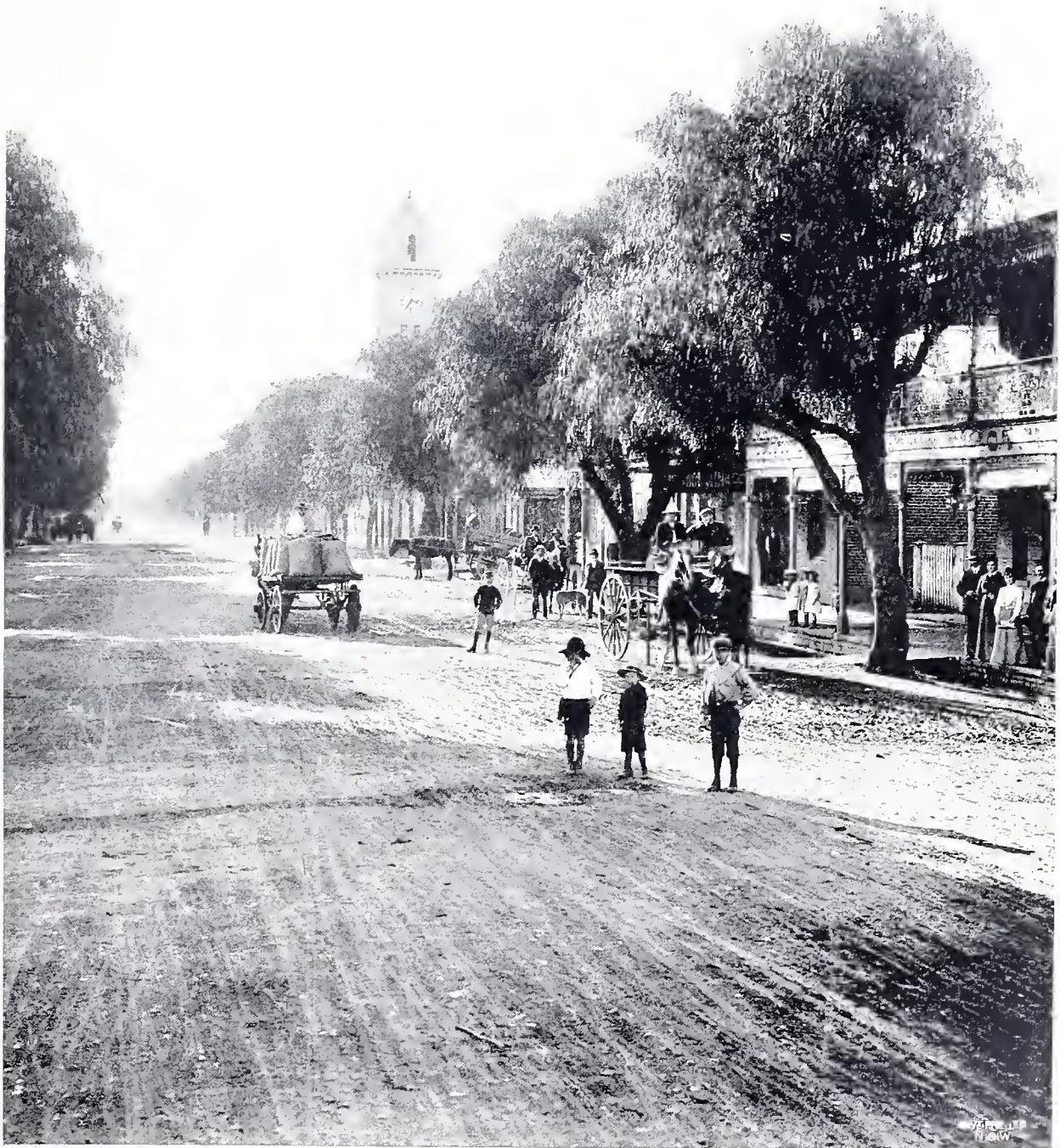
TYPICAL LISBON LEMON, GROWN IN N.S.W.

imported article from our markets, and the few hundred tons which have been sent to London have been very favourably reported upon. It is, therefore, only a matter of time before we shall be able to do at least our share in supplying that market with a good wholesome article, such as they will find it next to impossible to procure from any European country. It has the flavour, is fleshy, and is of most attractive appearance. The day is not far distant when we shall grow enough of these fruits for our own market, and have a large surplus for export; and for the person whose heart is in the work, and who is prepared to work on the most up-to-date lines, there is a big opening. The State Government is talking of starting a large irrigation scheme, which will command some of the best land in this State, and when the scheme is in

running order the Government will be in a position to offer favourable inducements to those who wish to go into fruit-growing on a commercial scale.

Valuable Government Aid. At the Government Experimental Orchards, which are situated in different climates and districts, large collections of the various fruits are growing; so that we are in a position to say with a fair degree of accuracy which varieties do best in each particular district. There are also many private orchardists who are only too pleased to give to the newcomer the advantage of their experiments, and, therefore, he is saved the trouble of having to pay for his experience by experimenting with many varieties in order to ascertain which is most suitable for his particular district. There are also several good nurseries where the best stocks can be procured, and where the nurserymen are in a position to guarantee that the trees are worked on the most approved stocks. I do not know of any place where worked nursery stock in good condition for planting can be purchased at so reasonable a price.

The Government is always willing to put at the disposal of the grower all the information he may need, and he can at all times visit the Departmental orchards to see how the various branches of the work are carried out. This is of considerable importance to the beginner as he can usually pick up the information he requires, or obtain advice on any matter about which he is in doubt.



PEEL-STREET, TAMWORTH. A TYPICAL N.S.W. COUNTRY STREET SCENE.

LINDEMAN'S FAMOUS *CAWARRA WINES*

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BE SURE that you get CAWARRA. . . .

H. J. LINDEMAN,
CAWARRA VINEYARDS, N.S.W.

CELLARS: QUEEN VICTORIA MARKETS, SYDNEY.

Viticulture.

BY M. BLUNNO.



THE immense territory of a new country like Australia enables the colonising population to pursue widely diversified agricultural enterprises, inasmuch as the variety of soils, and principally the variety of climates, are the consequence of the diversity of the hydrographic and orographic features of the country and of its extensive range of latitude. That is the reason why, in new countries, we often find districts where tropical plants are grown for industrial purposes, while in another district we may find cultures that are

characteristic of temperate and even cold climates. Then the extensive territory affords the settling population the choice of the district and the soil in which any particular form of culture can be most profitably followed up, thus leaving nothing to chance. The natural fertility of a virgin soil adds to the advantages just mentioned; while the liberality of the Governments of new countries, the more democratic laws—all directed to assist exploiting the natural wealth of the soil, the absence of clashing and firmly established interests existing in older communities, coupled with energy and intelligence—often the only heritage of the emigrant—cannot fail to produce the highest results.

A glance at the map of New South Wales, and a perusal of the meteorological reports, will convince anyone that in many districts of this State viticulture ought to find a natural abode. Sunny lands are the home of the grape-vine, this queen of industrial plants; and New South Wales has been given, long ago, that epithet of brightness.

In the whole of Australia some 60,000 acres have already been devoted to viticulture, which is not as great an expansion as might well have been, and does not come up to the greater impulse given to vine-growing in new countries by no means better favoured in the way of natural advantages. In several of the South American Republics, in a much shorter time, viticulture, wine-making, and distillation have attained a larger development. The reason is one of racial habit and art of living. The population of Australia is of the Anglo-Saxon breed, who, in their glorious birth-place, cannot follow vine-growing on account of the bitterness of the climate in many parts, and its inclemency and uncertainty in others, where, nevertheless, the yearly mean temperature is the same as that of some of the most famous vine-growing districts of their

southern neighbours. The art of living of a people depends almost exclusively on the nature of their agricultural pursuits. The Anglo-Saxon, not being a vine-grower, is not a wine-drinker in the true meaning of the word.

Viticulture can be carried on over a great expanse of the Commonwealth, and the Australian will in time become a wine-drinker. An inveterate habit like that of drinking the fermented and distilled product of grains cannot be eradicated in the course of a generation or two, notwithstanding the mild climate of Australia, which should at once induce people to prefer lighter alcoholic stimulants. Change of diet cannot be effected at one stroke; it is a matter of acquired taste. This is brought about by degrees, until it establishes itself like a second nature.

It behoves those in authority, who have to guide the community to the goal of a leading place in general progress and prosperity, to consider viticulture in the light of one of the most important agricultural enterprises for the permanent settlement of people on the land. Viticulture has the character of permanency. A well-planted and well looked after vineyard lasts, in the economical sense, forty years or so. There you have at once two generations working in it. Cellars and appliances and casks last a long time, and can hardly be turned to any other purpose. Viticulture and, still more so, wine-making require a certain knowledge that is gained by proper training, which the children of a vigneron and wine-maker take as part of the family heritage. That is why viticulture, once started, is followed in a direct line by the children of those who first commence.

Growing grape-vines means extensive employment of labour; and vine-growing districts are, after the manufacturing and mining centres, the most densely populated. Emigration from vine-growing countries is *nil*; immigration, on the contrary, is to be looked for. When the French vineyards disappeared almost entirely from some districts of France, under that terrible scourge of phylloxera, the population thinned out at the same rate as the vineyards were destroyed by the plague.



A NEW SOUTH WALES VINEYARD.

I have seen many families in this State who live very comfortably on some ten acres of vineyard. There has never been yet in New South Wales a supply of wine greater than the demand. Vignerons sell their wines with the greatest ease, and the one million of gallons, which is about the average annual output of the vineyards of New South Wales, can be increased to twenty times as much; and I feel sure that there would be a local market for it if a more energetic and systematic way of advertisement and distribution were followed—that is, exclusive of the export trade, the possibilities of which are unbounded if more business men will undertake it. The vigneron who has a quantity of good, sound wine in store is not haunted by



TABLE GRAPES GROWN IN HOWLONG.

any urgent necessity of getting rid of it at any price. Wine is not a perishable product if it is well looked after; on the contrary, with care and age it increases in value. Most of the wine produced in this State is sold by the vignerons to the wine merchants during the first twelve months following the vintage, thus leaving to the merchants all the cares of treatment and maturing. Yet the vigneron makes a profit, which averages from £10 to £15 per acre—that is, for vineyards of a certain acreage, where outsiders are employed in the vineyard and cellar work; but for smaller places, where the labour is done by the men folk of the family, the net profit is still higher.

The cost of establishing a vineyard and bringing it into bearing is about £25 per acre at the outside. The costly hand-trenching of the ground, in the generality of cases, now can be dispensed with, on account of the many patterns of ploughs and subsoilers, which, with the proper strength, can reach a depth of twenty inches. On behalf of the Agricultural Department, I had in 1901 thirty-one acres of land, which had just been cleared of a rather thick and heavy timber, ploughed and subsoiled to the average depth of twenty inches, at the cost of £9 10s. per acre.

Vignerons in New South Wales, though not forming a very large community, make a nice living, and this is borne out by the look of their homesteads, the happiness in their family relations, and the easy life that they enjoy. I have had the privilege of visiting most of the

vine-growers of this State, and always left edified with the appearance of everything, and with their amiability and hospitality ; and even when I examined their position from a critic's point of view, I could see that it was not show, but substance.

Yet the vignerons of New South Wales have so far only concerned themselves in the making of wines, and have neglected to utilise the by-products of this industry. In Southern Europe the grape skins (husks), after fermentation, are worth about 30s. per ton, and the wine-lees more than that. A considerable amount of spirit can be obtained from them, while they are the only raw material from which cream of tartar and tartaric acid can be obtained.

Australia imports every year thousands of pounds worth of both these substances, largely employed in domestic economy and in medicine, when they could be prepared here. The Agriculture Department has often been asked to forward to European manufacturers samples of wine-lees and wine-stone, and has unfailingly received reports confirming the high percentage of pure cream of tartar contained. I have tested the wine-stone from a few cellars in the Hunter River, and found as much as 85·5 per cent. of pure cream of tartar.

The reason why nothing has been done to turn into profit the by-products of wine-making is that vignerons have found wine-making by itself profitable enough without spending more energy in a secondary enterprise. But what is only a secondary enterprise for the individual may be the principal business of a collective institution, which could buy from the



WINE GRAPES GROWN AT HOWLONG.

vignerons the raw material and refine it. The vignerons can easily distil the husks and obtain spirit; the solution left after distillation being allowed to cool, sets free the wine-stone in red crystals, which need further treatment before becoming fit for use in medicine and in domestic economy. The further treatment

of the wine-stone would then come within the domain of a factory. Such a factory as would limit itself solely to refining the wine-stone and obtaining cream of tartar would not need large

capital, and the working expenses would be small. At present I would not recommend the manufacture of tartaric acid, which requires large expense at the outset for buildings and machinery.

The Wines of New South Wales.

Delicious wines are not the monopoly of any particular country, and though the continent of Europe undoubtedly holds the lead in the production and commerce of fine wines, yet no expert ever averred that those produced outside the boundaries of that country are necessarily inferior to the European wines.

Some high-class wines are produced in several districts in France, Italy, Spain, Portugal, Germany, Austria, Hungary, Greece, Cyprus, and in some of the southern districts of European Russia. Then again some of the Californian wines are of superior type; so also are some of the New Zealand



RAISIN GRAPES GROWN ON THE MURRAY.

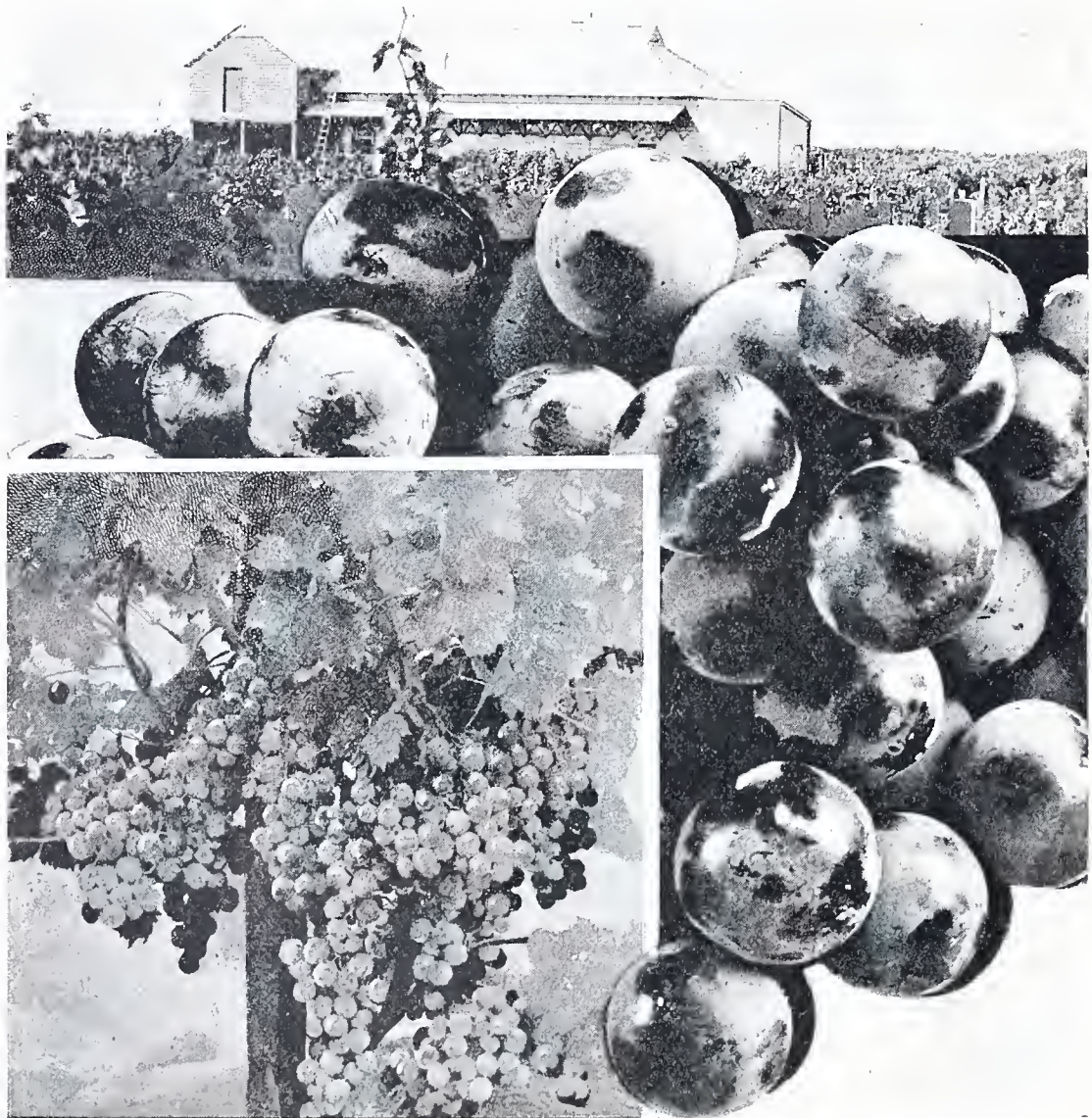
vintages; and, finally, we find in Australia a large stock of good, sound, wholesome wines, among which there are not a few of excellent character that vie with the best and most high-priced wines produced in any other continent.

People in general are conservative in matters of taste. This may or may not be a fault; but what is surely regrettable is to see people "drinking a name."

The real connoisseur is unprejudiced: he pleases his palate, not his imagination: he cares not for fashion; he makes it. Anyone who has followed the various events in the viticultural development of different countries knows full well that the production of certain *crûs* (vintages of certain vineyards) which have a world-wide fame is very small, and of late years through the ravages of phylloxera among French vineyards, the proportion has been still further reduced to almost an infinitesimal quantity. Yet the amount of wine sold under the label of famous *crûs* is altogether out of proportion to the quantity of the genuine article produced.

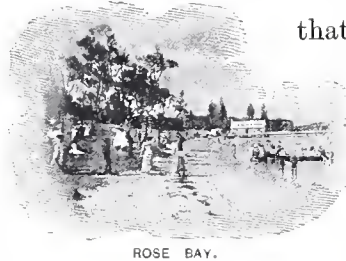
The quality of wine depends on four factors, which are soil, climate, variety of grapes, and manufacture.

In the preceding paragraph of this article I have hinted at the variety of soils in New South Wales, many of which are exceedingly suited to vine-growing for wine-making purposes. The climate, also, is splendid. Then the best accredited sorts of wine-grapes have been imported from France and other continental vine districts, while as to the manufacturers, we have a class of intelligent, well-to-do, practical vigneron and wine-makers who know how to make most of the natural advantages of this country. It would be invidious for me to single out anyone for public recognition ; but it is a pleasure to have to say that the progress made during the last few years is enormous. The seeds of knowledge fell in good ground ; the keen capacity of the vine-growers for seizing information and turning it to practical account has been to me always a source of delight. Five years ago the question of controlling the



VIEW ON A HAWKESBURY VINEYARD.

temperature of the fermenting juice was absolutely ignored by the many ; now it is generally one of the most important operations at fermentation time. The different devices for preventing a rise of the temperature in the fermenting vats have been largely adopted. Preference is given in many cellars to the cement vats which allow of a greater dispersion of heat than the wooden ones. Many are the contrivances for æration and cooling down of the juice ; and, according to the importance of the cellar, they range from an ordinary wooden pump or coils, through which runs fresh water, to the last pattern of must-refrigerators. The *turbine* of white musts is a modern practice which is now being followed with great success in certain cellars. By imparting to the must a centrifugal movement at the speed of only 500 to 600 revolutions per minute, a decrease of from 18° to 20° Fahrenheit in the initial temperature of the juice is obtained, followed by a quicker separation of the sediment, thus ensuring a purer fermentation and increasing the sound-keeping qualities of the wine. Steam-power is more largely diffused, and up-to-date labour-saving plants are more largely employed for the hoisting up of the grapes, crushing them, and separating the stalks. Continuous presses have also been imported, and steam-pumps find a larger application. Vignerons quite understand that wine-making is entirely dependent on scientific principles which must be practised to secure success. They study more, and are more conversant with the chemistry of grape-juice and the wines, with the principles of eases of wines, and the different vinous fermentation, with dis- undergo ; and all this increased intellectual activity has sup- planted old dogmatic practices, corrected erroneous ideas, and displaced inveterate prejudices, with the result that the wines are better, the profits higher. Several large vineyards have been recently planted ; many of them are already in bearing ; more new and well-appointed cellars have been built.



The great variety of soils and climates in New South Wales necessarily impresses a variety of characters to the wines produced.

We have the wines of Corowa and Albury, where the wine merchant finds the parallel to the products from the vineyards round the basin of the Mediterranean sea, with one important advantage in favour of our Riverina wines—
An Important Advantage. that the class of grapes cultivated here is the Syrah (Australian Hermitage, Black Shiraz), which, in a climate just as hot and dry as many districts of South Europe, gives wines superior to the Barletta, Milazzo, Riporto, Alicante, Benincarlo, Huesca, and Aragona, which are not drinkable by themselves, so heavy and rough are they unless blended.

The red dry wines of Albury and Corowa are rich in colour and extractive substance, with an alcoholic strength ranging from between 22 and 25 per cent. of proof spirit, clean to the palate, wholesome, and blood-making. After about three years of proper care and treatment, when they have lost the natural roughness of young wines, they develop a marked bouquet and fragrance which deservedly confer on them “the honour of the bottle.” These wines, as a



A BUNCH OF N.S.W. TABLE GRAPES.

finished article, find their place at the dinner-table, and the proper time to drink them is with the meat course, as they are what the French call *Vins de rôté*. These same wines, when young, feed the bulk trade. They are bought by wine merchants, who judiciously blend them with lighter wines from other districts, and are put on the market as *vins ordinaires*, which are sold by gallons or quarter-casks to the wine-drinking community of this country, and you find them on the table of those restaurants who follow the Continental style, where wine is part of the bill of fare and the customer drinks it *ad libitum*. These Riverina wines are the basis of another important business—the export

trade. Any wines grown in that district, as long as they are dry, clean to the palate, sound, and full-bodied, are sold in bulk, at a very remunerative price, to London buyers, who, as a rule, prefer them when only 18 months old. They are consumed in England, which speaks well for those wines, considering the fastidious taste of the English wine-drinker. There is such immense scope in the export trade that the only thing necessary is to grow more and organise a proper system of marketing; the latter, however, is outside the province of the vignerons themselves, and demands the attention of skilled business men.

A district where such wines are grown is also suitable for the production of dessert wines. Luscious Muscats, Sherry, and Port are grown and made there, and I am quite satisfied that capitalists would find a great and profitable investment in the development of this trade. I hinted at the necessity of capitalists, because in the making of dessert wines, age being one of the principal factors, it is necessary to lay out a certain amount of money every year with which to buy the raw material from the smaller growers, and then wait three or four years for the return.

The wines of the Hunter River Valley have ere now made a name for themselves, and viticulture there, as in the Riverina, is making long strides. The Clarets, Hocks, Chablis, and Sauternes of the Hunter Valley are delicious, and have gained recognition at several International competitions; are much appreciated by the wine-drinking *gourmets*; and compare with the choicest vintage of any other Continent. Well has the name

of "the *Côte d'or* of Australia" been given to the Pokolbin district and surroundings. Those who admire landscapes—and every man does who can, in these prosaic times, contemplate the beautiful—should visit this district or the Paterson. Those who love to be reminded of old Home will find in the Hunter River vine district a vista which gladdens the heart, while the invigorating air and the picturesqueness of the country, inviting to outdoor life, are sources of physical and mental vigour.

The vineyards, like green dazzling gems, emerge from the sombre hue of the wood, the homesteads coquettishly built at the summit of the hills enjoy the glittering pomp of sapphire and gold, which envelops the land for miles around—veritably a vision to evoke the muses.



OUTSPANNING ON THE ROAD.

What shall I say of the wines of the Hunter Valley—of its clarets like molten rubies, of its Chablis, Hocks, and Sauternes like liquid gold, of their delicate fragrance that tickles the palate and gives the pleasure of a prelibation. They are a happy combination of nourishing elements in which there is not one discordant ingredient, making a harmoniously palatable whole, the proper assimilation of which brightens the face of the happy epicure, gives his thoughts lucidity, wit to his tongue, an unusual power to his digestive organs, and leaves him, after the feast, fitter for work, and without anything to regret.

Precious wines are not limited only to the Riverina and to the Hunter River districts, as we find extensive vineyards and huge cellars in the County of Cumberland, and on the Hawkesbury River, only a few miles from the metropolis; also around Mudgee and Tamworth, in the New England district, there are many vineyards where the cooler climate confers on the wine a characteristic affinity with the wines produced in the colder vine-growing districts of continental Europe.



DANGAR'S CREEK. ARMIDALE.



A COUNTRY ORCHARD.

The Principal Wine-grapes.

A list of the principal sorts of wine-grapes grown in New South Wales will be of interest as showing that some of the finest varieties, producing high-class wines elsewhere, are grown here also.

For the better understanding, I give the Australian synonyms, when they have any.

For Red Wines.

Australian Synonyms.

Syrah	Black Shiraz—Hermitage.
Malbeck.	
Cabernet	Carbinet.
Verdot.	
Lambrusquat	Black Spanish.
Espar	Mataro. Mourvedre.
Mammolo.	
San Giovese.	
Pinot Noir.	
Aleatico.	
Frankental	Black Hamburg.

For White Wines.

Riesling	Riesling.
Sheperd's Riesling	A seedling of the true Riesling seemingly, created in South Australia.
Tokay.	
Verdelho	Madeira.
Pedro Ximenes	Pedro.
Marsanne	White Shiraz.
Muscat de Frontignac	Frontignac, which turns to a dark pink when well ripe.
Gouais.	
Pinot blanc.	
Chasselas.	
Blanquette.	

With such climate and soil, some of the best sort of grapes, intelligence, and capital, Australians and all Britishers should realise the particularly suitable conditions for the production of fine vintages. The grape-vine in Australian soil finds a magic crucible where the juice of the earth is transformed by the sun's rays into a goodly beverage, a fitting reward to the toil of its inhabitants in conquering this Continent for civilisation. It is but ignorance or envy that has attempted to create a prejudice against them.

The high quality of our Australian wines should be more loudly proclaimed for the truth's sake, and for patriotic reasons. What better recommendation can they carry than that of strangers from continental Europe—generally connoisseurs of wines—naturally with a leaning to praise the wines of their own country above every other, and yet bound to admit, in surprised delight, the fineness of the fermented grape-juice of this fair land.



PICKING GRAPES.

The For the purpose of determining varieties of phylloxera-resistant vines best adapted to the requirements of vine-growers in various parts of the State, who wish to avail themselves of this means of protecting their vineyards from the ravages of phylloxera, should the pest unfortunately spread beyond the limited area to which it is now restricted, nurseries have been established in several districts. The principal one is at Howlong. There the collection of varieties will

Departmental Nurseries.

be kept as complete as possible, for demonstrative purposes, in several classes of soil, varying in texture and chemical composition. Cuttings and rooted vines are sold at a nominal rate, and every opportunity is taken to instruct vine-growers as to best stocks to use and how to work them. An average of 60,000 rootlings and cuttings of phylloxera-resistant vines have so far been distributed annually.

In December, 1902, an Act against the adulteration of wines was passed, and an œnologic laboratory for the analysis of wines has since been attached to the Viticultural Branch of the Government Service. Samples of wines are systematically taken from wine-shops and wine-cellars, and analysed, in order to prevent manipulations that would reduce the wholesomeness and nourishing properties of this beverage. However, it is satisfactory to note that in three years since the enactment of the law only a few sporadic cases of adulteration have come under the notice of the ever-vigilant authority, cases which, needless to say, have been severely dealt with.



A VINEYARD IN THE HUNTER RIVER VALLEY.

This industry is one of the most remunerative, and already a third of the area under vines in this State is planted with table-grape varieties. To the uninitiated it might seem incredible that there are families in this country of broad acres living very comfortably on 5 acres of table-grape vines. Yet such cases are numerous, and will be found mostly within the metropolitan area of Sydney.

**Table-grapes
Industry.**

A crop of 3 tons per acre is an ordinary one, and good early and late kinds fetch at least 2d. per lb. A vineyard of the size mentioned can be well looked after by a man and a boy. A father with a son of 18 can do all that is required in the way of tillage, of winter and summer pruning, spraying, grape picking, packing, and marketing, and yet not fail for days of leisure through the year. It is obvious that the secret of the success lies in being near a centre of population, and in growing principally such varieties as are amongst the first or the last to ripen, so as to avoid the time of glut. Late grapes are sold on the Sydney market which have been grown 300 or 400 miles away.

Table grapes in this State grow to perfection, the bunches attain extraordinary sizes, are juicy, have fine colour, and most delicate flavour. White Sherry, Black Hamburg, Black Muscat Hamburg, Muscat of Alexandria, Chasselas, and Doradillo are about the principal varieties grown, besides forty or fifty more varieties more or less predominating.

. So far the raisin industry is pursued on a very limited scale. Yet there is a great scope, considering the local demand and the fact that this State is still tributary to other countries for its supply.



UPPER SNOWY RIVER.



SCENE ON THE ROAD TO TWEED HEADS.



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The Pastoral Industry.

Sheep—Cattle—Horses.



EW South Wales is the great sheep-breeding centre of Australia, and the leader of the world in the production of fine merino wool. Merino wool is the main feature of the primary industries of the State, its annual value being about half the total production. While the bulk of the sheep shorn are at present run on the big stations and held in vast flocks numbered by the hundred thousand, the tendency is for the smaller holder to go in for wool-

growing. As is mentioned elsewhere, in the chapter on Mixed Farming, comparatively small holders are finding it profitable to rest their land from wheat-growing by running sheep upon it; and close to the coast where wheat is not grown, and the country is not so suitable for the production of merino wool, the English breeds, greatly the superior of the merino for mutton purposes, are being raised in increasing numbers as an adjunct to agricultural pursuits.

At the end of the 1905-1906 shearing season it was estimated that there were between 40,000,000 and 42,000,000 sheep in New South Wales. The flocks increase very fast in favourable seasons, and with the spread of the smaller flocks among the farmers the number may be expected to increase steadily year by year in spite of possible adverse conditions. Future droughts should not so seriously diminish the numbers of the sheep depastured as those of the past, inasmuch as station-owners have realised the possibilities of hand-feeding when the natural pastures give out, owing to dry weather; and an extension of this system (the fodder being grown on irrigated plots) would not only keep the sheep through a drought, but would materially augment the carrying capacity of the country. So that the possibilities of the State in the direction of producing that magnificent merino wool which has made the name of New South Wales famous throughout the civilised world would seem to be boundless.

The history of sheep-breeding in New South Wales goes back to the
Back to the eighteenth century. Captain Macarthur, to whose enterprise and foresight
18th the pastoral industry is immensely indebted, owned a flock of 1,000 sheep
Century. in 1795. These animals were held in high estimation, and gradually increased
 in value until ten years later the market price of a fat wether had risen to
 £5. Captain Macarthur imported some fine Spanish merino rams and ewes from the Cape of

Good Hope, and by careful breeding in a few years he so improved the strain that he obtained fleeces of a very fine texture, which met with the ready appreciation of English manufacturers. Macarthur was not, it is believed, the first to introduce merino sheep into Australia; but, at any rate, to him is due the credit of having been the first to prove that the production of fine wool could be made a profitable industry in New South Wales.

Prior to the last century the production of the finest wool had been confined chiefly to Spain, and woollen manufactures were necessarily carried on in England upon a somewhat limited scale, which was not likely to improve, in face of certain restrictions which the operatives endeavoured to place upon their employers. These men, in support of their contention that the woollen trade could not be expanded on account of the limited supply of raw material, argued that fine wool was obtainable only in Spain; and it was at this favourable period that Macarthur arrived in England with specimens of the wool obtained from his finest sheep, conclusively proving the capabilities of Australia as a wool-producing country. In this way he opened up with the English manufacturers a small trade which, as Australian wool rose in public estimation, gradually increased until it reached its present enormous dimensions.

**Climate
improved the
Wool.**

The Australian climate has in some respects changed the character of the Spanish fleece. The wool has become softer and more elastic, and while it has diminished in density it has increased in length, and the weight of the fleece has grown considerably heavier. Thus on the whole the quality of the wool has improved under the beneficial influence of the climate, and if no further enhancement of its intrinsic value can be reasonably expected, there is at least every reason to believe that Australian wool will maintain its present high standard of excellence.

So great a part does industrial life of the country the whole of the Western on 80,000,000 acres, is devoted to wool. There vast flocks runs, and their numbers smaller flocks held by Central Divisions, closer were just 6,119,163 sheep that date onwards there the flocks, until in 1886 depastured. Next year the total in 1887 being this number had increased



sheep-breeding play in the try that to-day practically Division, an area of just voted to raising merino are depastured on immense are augmented by the farmers in the Eastern and to the coast. In 1860 there within the State. From was a steady increase in there were 39,169,304 sheep there was a big increase, 46,965,152, while in 1889 again to 50,106,768. This

remarkable increase continued by 5,000,000 a year until the highest point was reached in 1891, when the total number of sheep in the Colony was returned as 61,831,416. From that point the numbers gradually receded, until a severe drought in 1901-2 wiped out half the flocks,



A TYPICAL NEW SOUTH WALES MERINO RAM.

reducing the number from 41,857,099 in 1901 to 26,649,424 in 1902. In spite of a bad season there was an increase of 2,000,000 in 1903, while in the two years following—the seasons being bountiful—the increase was phenomenal, no fewer than 12,000,000 sheep having been added to the flocks since 1903; the number at the close of 1905 being returned as between 40,000,000 and 42,000,000. As previously stated, it is unlikely that any future drought will have such a serious effect on the flocks as those of 1901-2, as the lesson then learned has been taken to heart, and pastoralists are generally making provision for the conservation of fodder, while “mixed” farmers are raising smaller flocks in conjunction with cultivation, so that the danger from adverse seasons is being materially lessened. Certainly the prospects before the pastoral industry have never been so bright as at the present time.

The numbers of sheep in individual flocks have changed greatly in recent years. In 1891 there were only 13,187 holdings, but in 1904 the number had increased to 17,755, although the sheep depastured had decreased by over 27,000,000. It is significant to note that while in 1891 there were seventy-three holdings where each carried over 100,000 sheep, the number in 1901 was twelve, and in 1904 only five. The sheep in flocks of over 20,000 comprised 62 per cent. of the total in 1891, but only 36 per cent. in 1904.

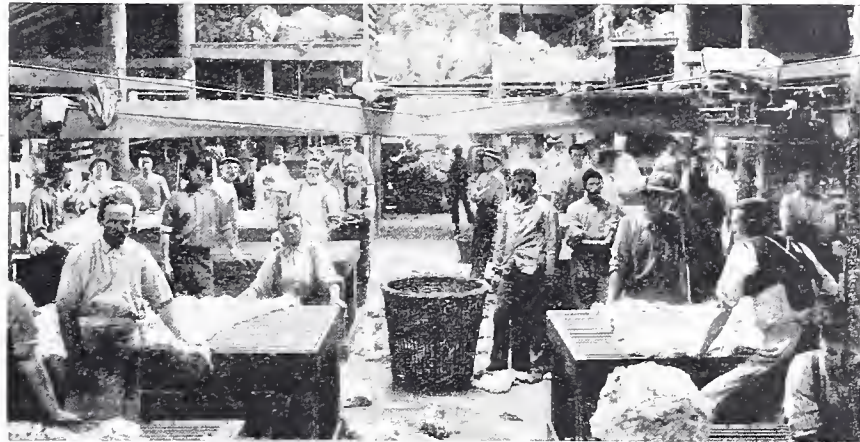
**The
Remarkable
Increase.**

The rapid manner in which the flocks of the State increase under favourable conditions is remarkable. After allowing for the causes which naturally impede the increase, such as the demands of the slaughter-yard, the requirements of the neighbouring States, and losses, it will be found that the rate of annual increase has been as high as 20 per cent., so that it is possible for the flocks of New South Wales to increase two-fold in about four years. Actual experience shows that such rate of increase occurred in 1904, and in several of the earlier years. During the period of five years from 1861 to 1866 there was a two-fold increase, and the flocks of the State were again doubled in the eight years from 1866 to 1874, and in the thirteen years from 1874 to 1887. The stock-carrying capabilities of New South Wales are very difficult to estimate, as the greater portion of the country is yet in its natural state. Improvements such as the subdivision of pasturage, a better system of water conservation and irrigation, an intelligent extension of the growth of saltbush, cotton-bush, and other drought-resisting shrubs and natural grasses, and the cultivation of artificial fodder, are gradually being effected, and will indefinitely extend the capacity for supporting stock of all descriptions.



HAMPDEN BRIDGE, WAGGA WAGGA.

The improvement of the Australian merino fleece from its primitive stages to its present perfection of development is a fascinating story. When Macarthur sheared his pure stud Spanish merinoes they averaged about $3\frac{1}{2}$ lb. of what would now be regarded as a very hairy product. To-day the stud merino rams will cut over 40 lb. of good wool, and the average for the 40,000,000 of the State's flock is nearly 8 lb. at each shearing. The frame of the animal is hardly any larger to-day than it was when Macarthur imported his rams and ewes from the Cape of Good Hope before the close of the eighteenth century. The improvement is practically in the wool only; and this having been developed apparently to its utmost capacity, both in quality and quantity, the breeders turned their attention to the task of increasing the skin area on which the wool grew. To this end the American Vermont merino was introduced, and the wrinkly folds of the skin on this sheep provided a much greater growing area. These folds are also to be found on other sheep, the Tasmanian merino being a magnificent specimen from which most of the flocks of the State are recruited, and there are very few smooth-bodied animals now to be found in the studs of any strain.



A WOOL-SORTING ROOM.

There is little agriculture outside the recognised wheat-belt. Beyond this line to the west the country is practically given over entirely to the raising of merino wool; the cattle grown in the State being chiefly raised on the Eastern Slopes of the Great Dividing Range and on the Monaro tableland. The western pastoral country, the home of the merino sheep, is traversed by the river Darling, which is navigable in good seasons from the Murray River, of which it is a tributary, to Walgett. Bourke, a town on the Darling, about 500 miles north-west of Sydney, is connected by rail with the Metropolis, and another railway runs north-west to Moree, both trunks having several branch lines. The Western Division is watered by the Gwydir, Namoi, Castlereagh, Macquarie, and Bogan, in addition to the Darling. The country is all open plains, beautifully grassed in seasons of good rainfall. Some of the homesteads dotted over this vast expanse of pastoral country are veritable mansions, and it is here that true Australian hospitality finds its highest expression. No traveller through the pastoral country thinks of making his stay at public-houses. He drives to the nearest station homestead at the end of his day's journey, and, though he is a complete stranger, his horses are cared for and he is made free of the best accommodation in the house.

On the best improved stations—as sheep-runs are called—extremely comfortable quarters are provided for all the employees. The sheep are cared for on a system calculated to obtain the best results in the shortest space of time. The property will be comprehensively subdivided by sound fences, the boundary being in all probability rabbit-proof. The sheep are worked in separate lots. Lambing ewes are kept together, and after weaning the weaners are put on the best feed. The young wethers are also kept on good feed, and as many as possible are fattened off. The practice is to cull the flocks every year, thus keeping the best, and constantly improving the average wool capacity. Many stations have stud flocks and breed rams for their flocks, introducing fresh blood from time to time. A station carrying 50,000 to 100,000 sheep employs from forty to fifty men all the year round, the wages being to competent hands £1 per week and rations, and a cook is provided, who draws all the rations through the station storekeeper. The shearing is done by piece-work, £1 per 100, and when the sheep are shorn the shearers pack their swag, mount their horse or bicycle, and depart for another station.



WAITING TO BE SHORN.

**A Golden
Period.**

Wool has been at a high price all through the past season, and the period has been a golden one for pastoralists. With increasing flocks, good seasons, and high prices the outlook has been particularly bright. The sheep is described by a recent expert writer as being a most reliable animal for profit. "Kept in any good district," says this writer, "and managed with a moderate degree of intelligence, it fairly spins money for the pastoralist. The wool market is absolutely sound, and Australian wool fetches the cream of the prices whether it be sold in Sydney, London, or Antwerp. Of all animals the sheep is the easiest to manage, and the occupation of the sheep-raiser is the easiest and pleasantest imaginable. The station-holder and station manager pass through their anxious periods, but the shearing comes round, the gleaming white staple is rolled into the bales, and the golden sovereigns which it must realise are assured. A flock which cuts an average of 8 lb. of wool per sheep is worth about 6s. per head to the grower at the present prices, and the increase is very valuable."



SHEARING BOARD,

**Equitable
Treatment.**

As wool is now being grown increasingly by small holders it may be as well to mention that the system of transportation and sale in New South Wales is so comprehensive and equitable that the small farmer with his few bales gets just the same treatment as the man who shears 100,000 sheep.

The wool-brokers place of the grower, and assiduously even though he be in a sheep's back is recognised and the farmer has no accommodation at a clip of even moderate size. The system is so liberal that the arrivals from the old class wool, a most important work on a station at a course of lessons at the



A SYDNEY WOOL SHOW-ROOM.

every facility in the way of his business small way. Wool on the as a tangible security, difficulty in securing reasonable interest against size. The State education that the pastoral industry's sons or new country may learn to portance feature of the shearing time, by taking Sydney Technical Col-

lege. It would be necessary, however, to reinforce this instruction by practical experience, which could be gained on any big station without difficulty at shearing time.

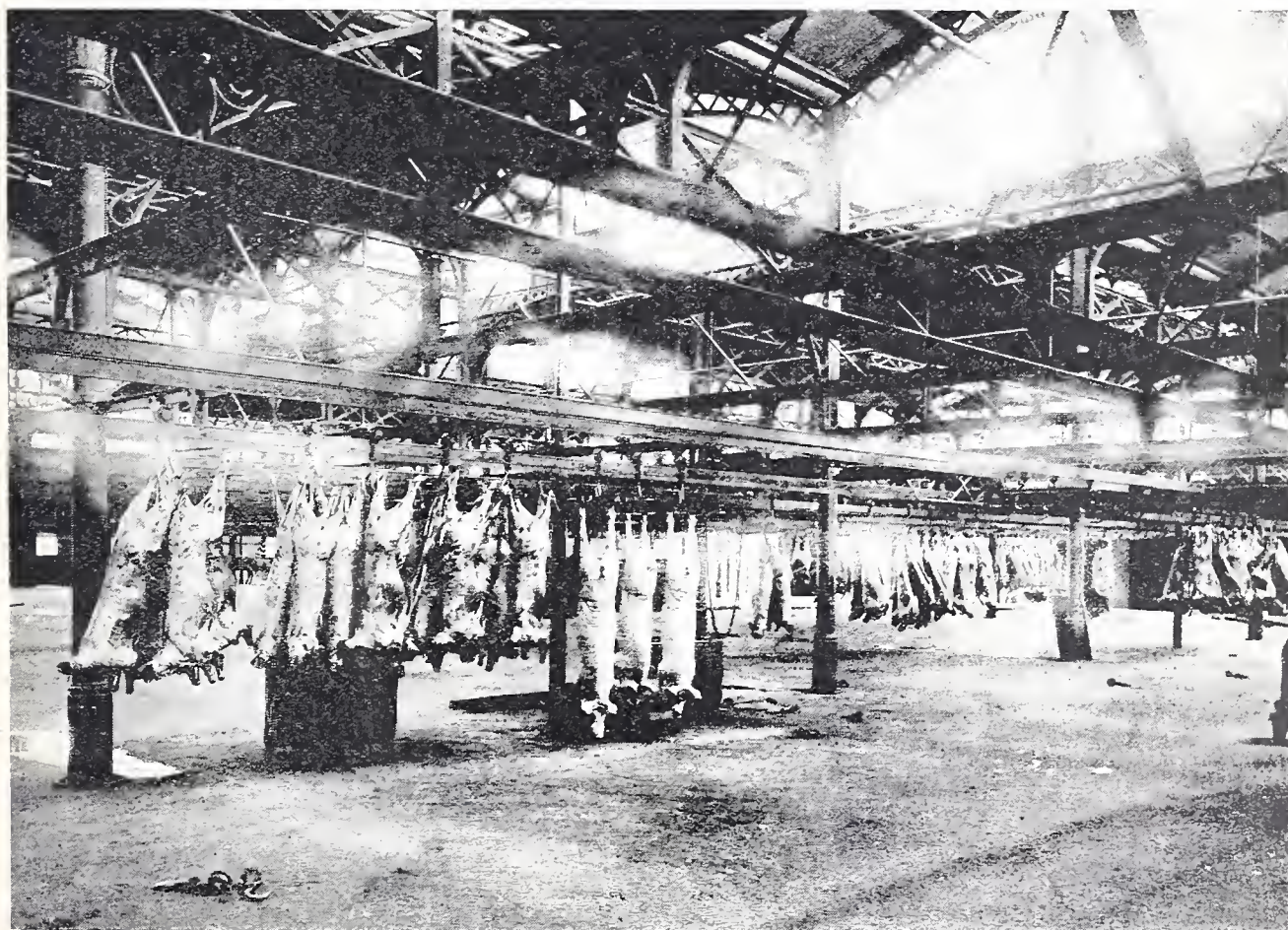
**Value
of the Clip.**

The wool clip of New South Wales is, as previously stated, its most important item of production, and it may be said that the prosperity of the State in a large measure depends upon the wool market. In 1902 the clip was worth £7,353,707; in 1903, £8,593,150; in 1904, £9,274,387; and in 1905, £10,040,000, while pastoral products generally in this year were valued at £16,500,000. With an average export of 250,000,000 lb. a rise of 1d. per lb. in the market price of wool means an addition of £1,041,000 to the wealth of the people of the State. A striking instance of the influence of a fluctuation in price is afforded by the figures for 1898 and 1899; in the earlier year the production was greater by upwards of 37,000,000 lb., while the value was £1,700,000 less. The average weight of the fleece during the past four years has been about 7½ lb. Of late years there has been a marked improvement in this direction, and a remarkable proof of this fact is afforded by a comparison of the figures relating to the periods ending with 1890 and 1904. In the earlier year the sheep numbered 14,800,000 more, yet the average annual production of wool was only 8,000,000 lb. in excess of that of the later period, the decrease in the number of sheep during the interval being 31·2 per cent., and in the volume of wool 3·1 per cent. At one time almost all the wool was shipped on the grower's account and sold in London, but of late years fully 80 per cent. has been sold in the local markets, as purchasers have realised the advantage of buying on the spot.

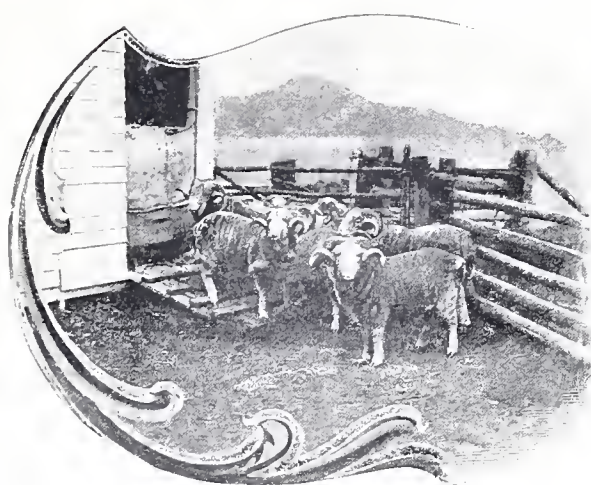
Apart from the wool, there is the local and export mutton trade for the sheep-grower to think of. The demand for sheep for local consumption was, until recent years, so small that it did not appreciably affect the increase of the flocks of the State. This, however, is

**The Mutton
Trade.**

not now the case. The annual demand for food consumption within the State is about 6·5 per cent. of the number of sheep depastured—equal to about three-fifths of the cast. By “cast” is meant the number at the age when it would be more profitable to send them for slaughter than to keep them, in the case of ewes for breeding, or for further growth in the case of non-breeders. The cast, expressed as a percentage of the whole of the sheep depastured is a variable quantity, which, however, may be taken as about $11\frac{1}{2}$ per cent. The number slaughtered for export in a frozen or preserved state, and for tallow, brings up the total slaughtered to about 8·5 per cent. of the entire flocks. The requirements of the mutton trade have demanded an improvement on the carcase of the merino sheep, and this has led to the introduction and crossing with the merino of a number of English breeds. These sheep do better nearer the coast than the merino, and they are coming into favour with the holder who devotes his attention partially to agriculture and partly to sheep-raising. The climate of the Eastern Seaboard for a considerable distance inland is too moist, and a large portion of the country too poor, for the adequate sustenance of merinoes, but it is probable that the coarser breeds of sheep would not deteriorate through



COLD STORAGE AT DARLING HARBOUR.



the limited food supply and the rugged nature of the country. On the Northern Rivers and in the Southern Coast districts, where the soil is very rich, dairy-farming and agriculture are the leading, and, no doubt, the most profitable industries. Sheep-breeding is carried on to some extent towards the summit of the coast range; and within the last three or four years it has been proved that the Romney Marsh sheep will thrive even on the Northern Rivers. The 5,000,000 fat sheep and lambs required for home consumption every year are mainly

drawn from the highlands, the slopes, and the plain country nearest to the great range.

When prices at the city markets fall below a certain figure the buyers
Frozen Mutton and consignors for the frozen meat trade step in and help to keep the market
 for steady. The position in the London meat market for some time past has
Export. pointed to the conclusion that a steady demand for good sheep and lambs

from Australia may be relied upon for the future. New Zealand, by keeping up a regular supply of first-class crossbred mutton and lamb, has secured a high-class trade, and the lambs sent from Australia last season were considered equal to those of New Zealand. The number of sheep for cross breeding in this State is fast increasing, and as the demand in England, South Africa, and the East is constantly growing, there is every reason to be confident about the future of the capacity of the export trade to absorb the surplus fat stock at a figure profitable to the grower. In 1904 there were exported from New South Wales 34,500 quarters of frozen or chilled beef, and 570,934 carcasses of mutton, of a total value of £290,065, together with 8,136,873 lb. of preserved meat, valued at £135,073. In addition to the export of frozen beef and mutton there has grown up within the past few years a considerable trade in frozen rabbits and hares. In the State itself these animals now form a common article of diet, and a large number of persons are engaged in their capture and distribution. In addition to the carcasses, the skins of the animals are also exported in considerable quantities. There are other pastoral products and by-products in which a considerable trade is done, such as tallow, edible fat and lard, skins and hides, furs, horns, hoofs, bones, and hair.

There are two branches of cattle-raising carried on in the State—beef
Beef Cattle. and dairying. The dairy cattle are dealt with in the chapter relating to that industry. Exclusive of dairy stock there are about 1,500,000 head of cattle in the State. The Shorthorn predominates, the breed principally used for crossing with this breed being the Hereford, but the Black-polled Angus has been coming into favour of late years. The glorious climate of New South Wales is so congenial that very little housing of stock is necessary, even in stud herds. The best of the stud bulls are housed at night as



DAIRY HERD, MULLUMBIMBY, NORTH COAST DISTRICT.

a rule, and allowed to run in paddocks in the day-time. The cows, however, are scarcely ever housed, except in the coldest portions of the highlands. The breed of cattle throughout the State is steadily improving—a result due to the introduction of good stud stock, to greater care and attention exercised in selection and breeding, more particularly for dairying purposes, and to culling and keeping in paddocks. In order to encourage and assist dairy farmers in improving the breed of their cattle, the Government of the State imported some high-class stud bulls from England, which may be leased for a short period at a small fee. There are now twenty-five of these bulls, distributed amongst the chief centres of the dairying industry. During the year 1904, 440 pure-bred cattle were imported, chiefly from the other States of the Commonwealth. Importations from Europe and America were prohibited for many years, owing to the natural dread of the stockowners that their herds should contract diseases which have devastated the cattle of other countries. The prohibition was removed in 1888, and cattle are now admitted after strict quarantine. The number so admitted in 1904, included in the above figures, was twenty-six—ten bulls and sixteen cows. The breeding cows in 1904 numbered 592,000, and as there were 367,232 calves branded, the average calving was about 62 per cent., which may be regarded as very satisfactory. There is a great market for beef cattle almost at our doors—in the East. It is a market capable of considerable expansion, so that there is not much likelihood of the New South Wales beef-growers being able to overtake the demand.

Horses.

Australasia is eminently adapted for the breeding of horses, and as at an early period the stock of the country was enriched by the importation of some excellent thoroughbred Arabians from India, Australian horses soon acquired a high reputation. The abundance of good pasture everywhere obtainable also tended to bring about this kangaroo grass, especially charine matter, and young it. This abundance of natural in the stock of the settlers, great advantage had it not ness of horses led to a neglect consequence of the discovery increase in price took place. been a perceptible improve-horses, which now find a ready and other countries. The num- steadily increased from 1883 to 1894, when it stood at 518,181. Since then the number has fluctuated. A large number of horses were taken from New South Wales to South Africa during the Boer war, and recently the Japanese have been large buyers. The trade with India is a constant one of many years standing. In 1896 the number of horses in the State was 510,636, in 1897 498,034, in 1898 491,553, and in 1904 482,663.



IN THE AUSTRALIAN ALPS.

New South Wales is specially suitable for the breeding of saddle and light-harness horses, and it is doubtful whether these particular breeds of Australian horses are anywhere surpassed. On many of the large holdings thoroughbred sires are kept, and the animals bred combine speed with an astonishing power of endurance. Fed only on the ordinary herbage of the country, these animals are constantly required to perform long journeys in a short time, and they become hardy and sure-footed to a degree.



HORSES IN A NORTHERN BREEDER'S PADDOCK.

It is the possession of these qualities which gives them their great value as army remounts. In 1904 the number of horses exported to countries outside Australasia was 3,281, valued at £76,011.

Diseases in Stock.

As stated in previous chapters, the stock in New South Wales are remarkably healthy, sheep being practically free from disease. The chief diseases recorded during the last ten years are anthrax, footrot, fluke, worms, and the black disease. Scab has been unknown for many years. The mortality from anthrax was considerable until M. Pasteur's system of vaccination was introduced. The first operations were rather unsatisfactory; but in the following year they were quite successful. Such is the general belief in the efficacy of the treatment that over 1,000,000 sheep are now vaccinated annually, as a preventive measure against the disease.

The diseases most prevalent amongst cattle are pleuro-pneumonia, Cumberland disease (anthrax), black leg (symptomatic anthrax), tuberculosis, cancer, actinomycesis, red-water, and ophthalmia. About $5\frac{1}{2}$ per cent. of the stock on 102 holdings were affected by pleuro-pneumonia in 1904. Inoculation has been practised with good results. For each of the five years ended with 1904 the losses from tuberculosis were 3,850. Of other diseases, cancer and actinomycesis cause the most deaths, the average loss through these diseases being over 1,600 in each of the last five years, while in the same period Cumberland disease was responsible

for 450 deaths annually, blackleg 1,130, ophthalmia 500, and red-water 70. Australian cattle, probably because they live in a more natural state than those of other countries, are, on the whole, remarkably free from milk-fever and other complaints attendant on calving.

Very little disease amongst horses is known in New South Wales. During the past ten years anthrax has never been reported from more than two or three districts, and in some years has been practically unknown. Australian stringhalt—considered to be due to intestinal parasites—is somewhat more common, while cases of mange, influenza, ringworm, and strangles also occur. Glanders has been practically unknown for years, but cases of ophthalmia and blindness have been reported.

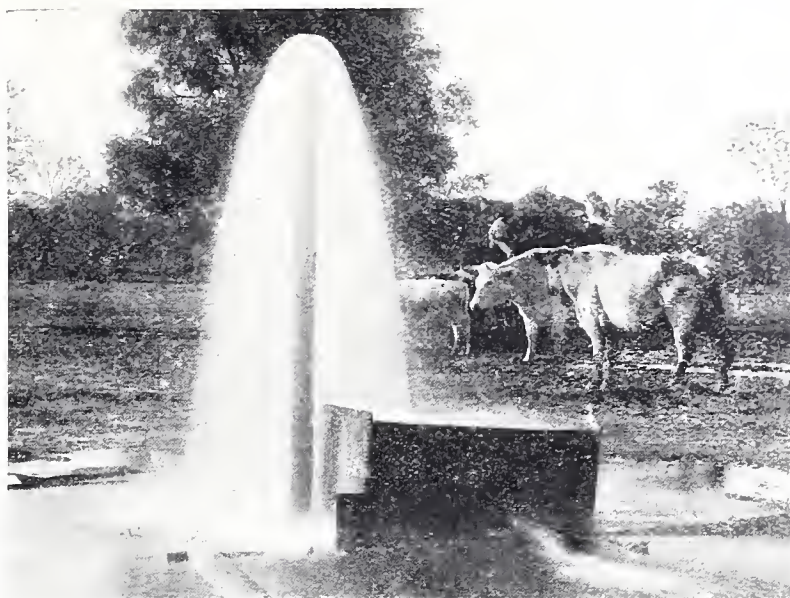
So far as noxious animals are concerned, the only one of consequence is the rabbit; and while the pastoralist earnestly desires the destruction of this animal, it is not without its champions; as a most profitable trade in exporting frozen rabbits and hares to England has been built up, while the skins are also of considerable value. But the damage done by the rabbit to the sheep pastures is most serious, and organised and persistent attempts are made to eliminate this drawback to the success of the pastoralist's operations. The chief methods of checking the spread of the rabbits in use are fencing with wire-netting, clearing the land of shelter, trapping, poisoning, and driving. The State has erected 1,330 miles of rabbit-proof fencing, and private owners have constructed 42,797 miles; the total cost of these fences being £2,295,222. An experiment is projected to test the power of an infectious disease to exterminate the rabbits. The experiment is to be carried out on an island off the coast of New South Wales by Dr. Danysz, of the Pasteur Institute.

No article on the pastoral industry would be complete without a reference to the artesian water-bearing belt, which extends across the greater portion of the northern part of the State. This water imprisoned in the tertiary drifts and cretaceous beds under the northern plains is of immense value. Anywhere on the water-bearing area a good supply may be obtained by sinking a bore, and the water when tapped rises to the surface, and frequently spouts many feet into the air above the pipe. The water was first discovered in 1879 at a depth of 140 feet, on the Kallara run,



TEAMS ON THE ROAD.

and since 1884 the sinking of artesian bores has proceeded in a scientific and systematic manner, under the direction of specially-trained officers. The deepest bore completed is that at Dolgelly, on the road from Moree to Boggabilla, where boring has been carried to a depth of 4,086 feet; this well yields a supply of approximately 682,000 gallons per day. The largest flow obtained from Government bores is from the Kenmare, on the road from Bourke to Hungerford; the depth of this well is

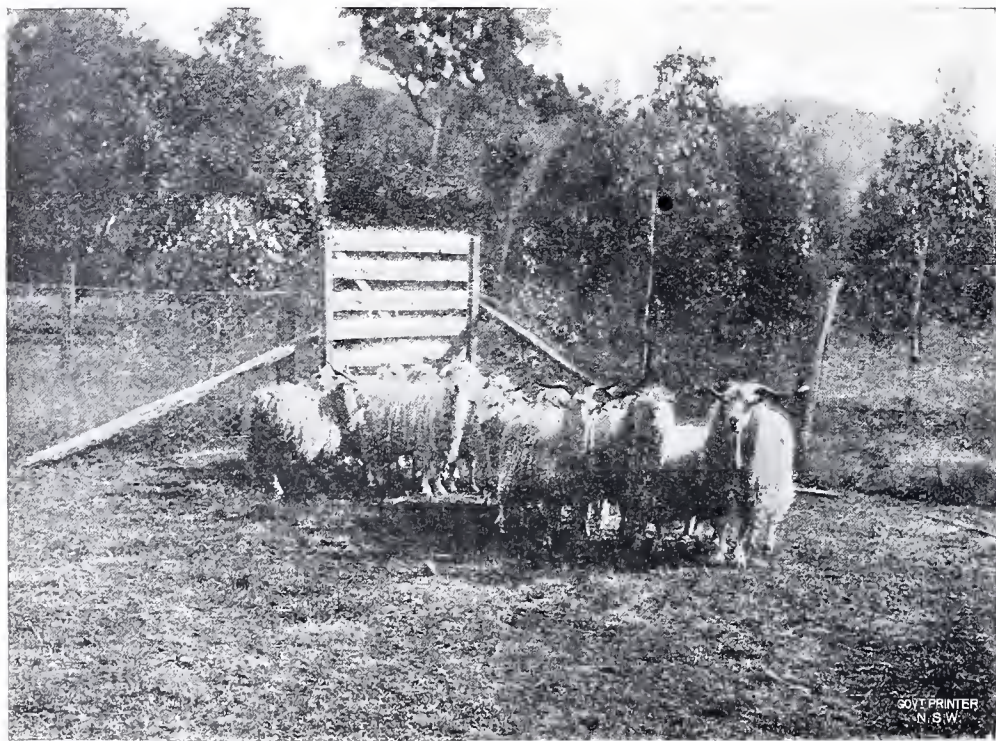


AN ARTESIAN BORE.

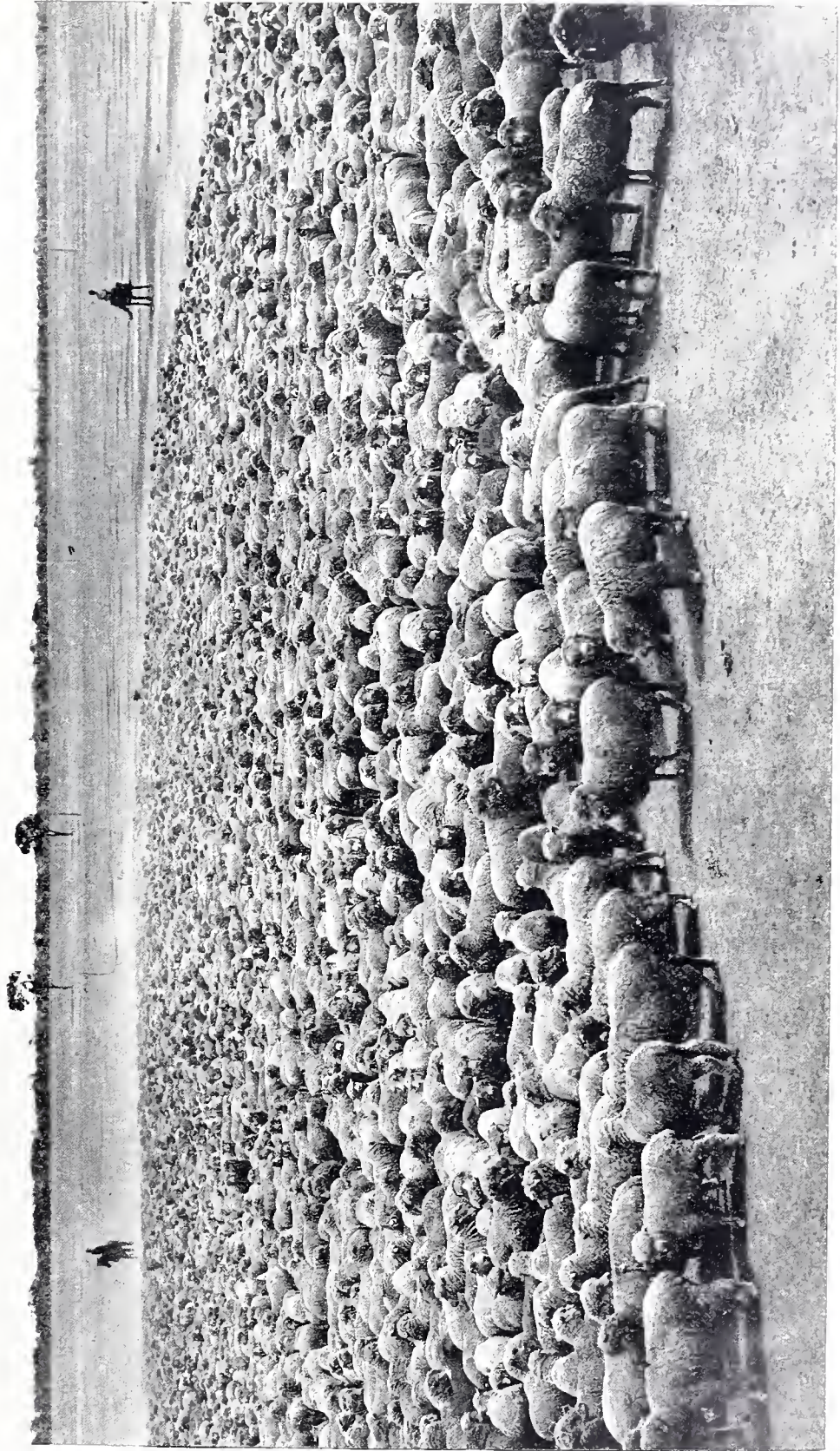
1,539 feet, and the estimated flow about 2,050,000 gallons per day. The flowing bores sunk by the Government yield over 30,000,000 gallons of water per day, and in addition there are pumping bores, which yield 500,000 gallons per day. Watering places are established on all the main stock routes of the State, and consist of tanks, dams, wells, and artesian bores. At the present time there are 295 tanks, 34 dams or reservoirs, 77 wells, and 67 artesian bores. The tanks have a capacity of up to 5,000,000 gallons, and in depth they range up to 20 feet. The supply for the 67 Government artesian bores on the various stock routes of the State is approximately 30,000,000 gallons per day. The Artesian Wells Act of 1897 provides that any occupier of land, or any group of occupiers, may petition the Minister to construct an artesian well and the necessary distributing channels for water. The petitioners are required to pay such charges as may be assessed by the Land Board, which shall not exceed the yearly value to each occupier of the direct benefit accruing to his land from the construction of the bore, and the supply of water from the same; but such charges cannot exceed 6 per cent. per annum on the cost of the works. Much has been done in the way of artesian boring by private enterprise. As far as can be ascertained, 259 private bores have been undertaken in New South Wales, of which twenty-two were failures, and twelve are in progress. Several of the bores have a flow of over 4,000,000 gallons per day, while the total daily flow is about 150,000,000 gallons.

The raising of mohair from Angora goats is a branch of the pastoral industry which is fast assuming important proportions. The Angora has been a denizen of New South Wales for very many years, the first progenitors of the present flocks having been introduced as far back as 1833. A great advantage in connection with the goat is that it will thrive in poor country that is practically useless for

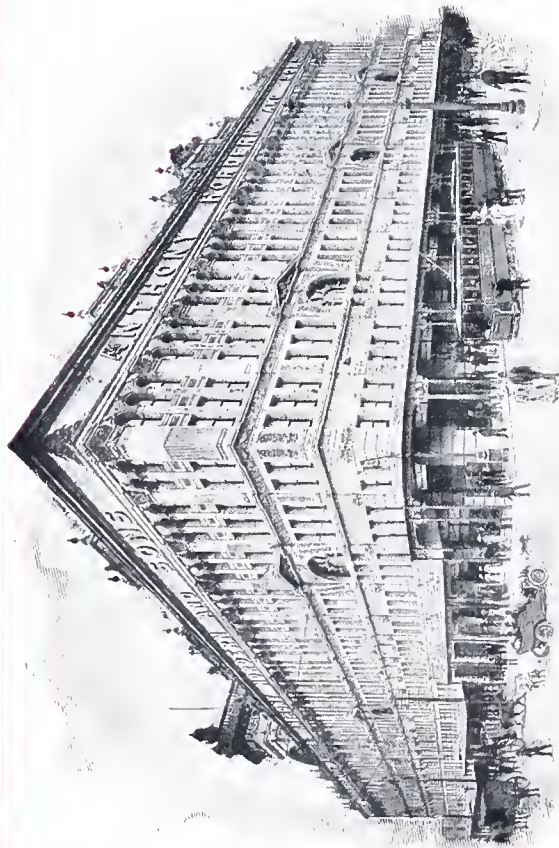
any other purpose, and pasturing goats on poor scrubby country has a vastly improving effect upon it. Within recent years a good deal of attention has been paid to the breeding of Angoras, and a considerable number of pure-bred bucks and does have been obtained from the United States. In the early part of the present year large purchases of pure-bred goats were made by breeders of this State in Adelaide, and in consequence our flocks received such an accession of strength that the seat of the Australian mohair industry has now been firmly located in New South Wales. Mohair and goat skins, like wool and wheat, are commodities in demand all the world over; their price, therefore, does not depend upon local requirements alone, and the promoters of the industry look with confidence to its future. There are, at present, about 35,000 head of goats in New South Wales; and while it does not appear probable that the industry is one that will rival sheep-farming, there is reason to believe that, with a climate so eminently suited to the production of the finest mohair, the export of this product will, before long, become an important feature in the commerce of the State.



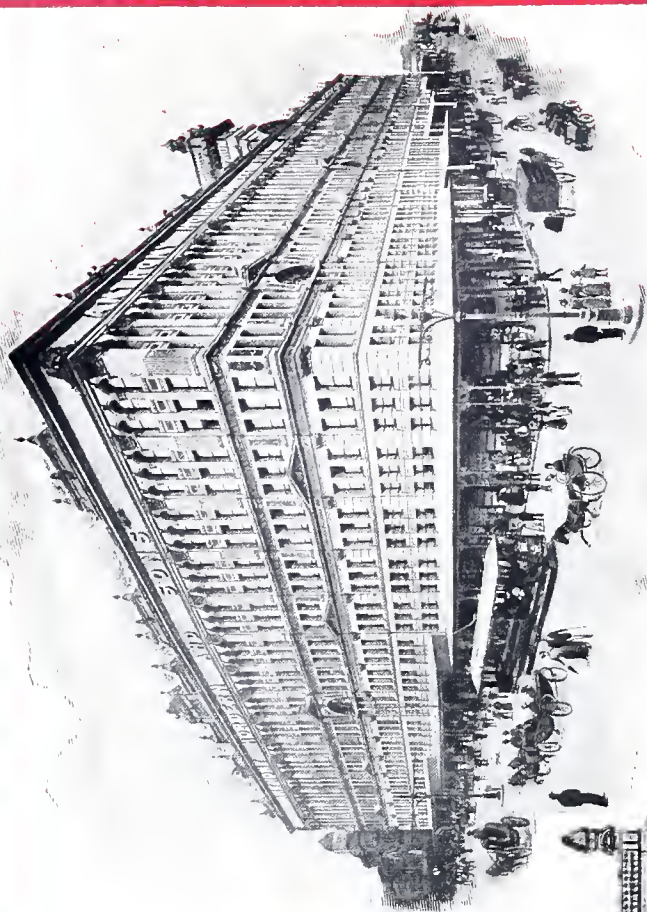
ANGORA GOATS.



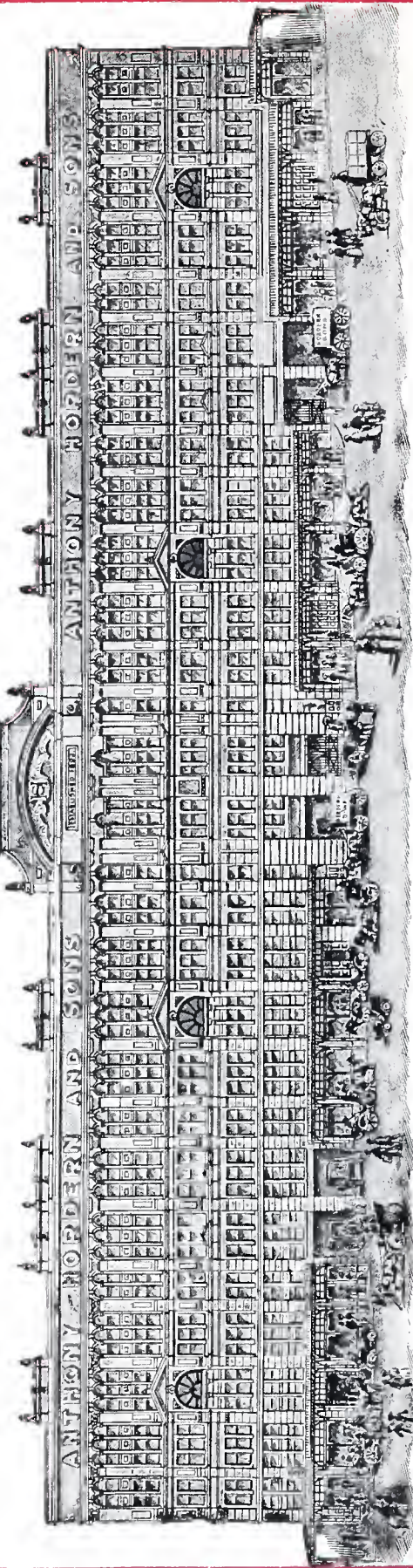
FLOCK OF SHEEP, BURRAWONG STATION.



GOULBURN AND PITT STREETS FRONTAGES.



GEORGE AND GOULBURN STREETS FRONTAGES.

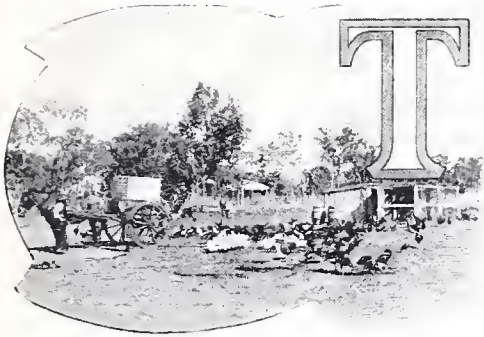


THE GOULBURN STREET FRONTAGE OF THE PALACE EMPORIUM, SYDNEY.

ON THE HISTORIC SLOPE OF BRICKFIELD HILL.

Poultry-breeding for Farmers.

By G. BRADSHAW.



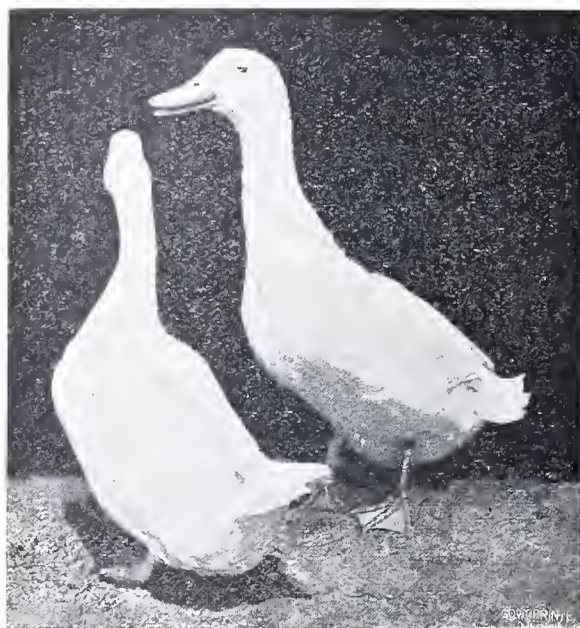
THE purpose of this paper being to supply reliable information on poultry-breeding to settlers, immigrants, and strangers from other lands, a departure is made from the customary manner in which this evergreen subject is treated.

Poultry farms, devoted to poultry only, obtain but to a small extent in any part of the world. The £10,000,000 worth of poultry carcase and eggs which annually reach England are produced in small quantities by large numbers of the peasant proprietors of France, by the peasantry of Russia, and by farm labourers, artisans, and cottagers of other Continental countries. Even the large poultry plants in America do not contribute to the export poultry trade of that country, their products being used largely for the supply of pure eggs for hatching, or the production of broilers—eight to ten weeks old chickens—which are largely used in the hotels in America. The large poultry-tinning plants and frozen export poultry trade done by Armour and other similar concerns are chiefly supplied by consignments from the farms and the small but numerous breeders of the United States. Even the large poultry farms which do exist are, according to a leading American paper, under a gradual evolution, as the following editorial, lately printed, will show :—

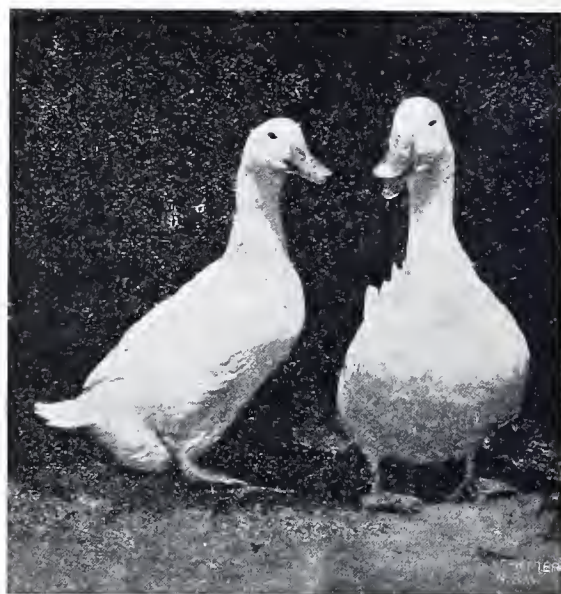
“Consideration of conditions leads us to take notice of the gradual evolution of the poultry industry. Hitherto the ideal of those looking for profits from fowls has been the exclusive poultry plant, and a great many plants have been established which the projectors fondly hoped would develop that ideal, and make fortunes for their proprietors. Such efforts have been but partially successful—indeed, too exceptional to be used as illustrations—and of late years we have seen a general breakaway from these methods, and often another abandonment of large exclusive poultry plants, and fortunately, on the other hand, a general awakening of interest in poultry among the farmers. In this evident increasing interest of farmers in poultry culture, we find the solution of the question of supplying the growing demand for poultry products. The farmers of the country can produce more poultry, and better poultry, and through them will come the evolution of the poultry industry in this country.”

All sorts of inducements may be held out to immigrants to New South Wales to part with their few pounds or hundreds. Agents will show them **Exclusive Poultry-farming** profits from poultry farming, and offer a choice of many bargains. Advertisements in the daily papers will appeal to them, and the suburban poultry farmer will view the time of arrival of the immigrant as that best suited to dispose of his "well-stocked profitable farm." Should any of these propositions be accepted, the transactions may be legitimate enough, but my advice to the new-comer would be, "Do not attempt to make a living out of exclusive suburban poultry farming."

After allowing for all the legitimate expenses, plant, capital, stock, labour, freights, commissions, fatalities, &c., there is a fair profit to be made, but certainly not sufficient to warrant anyone going into poultry farming with the intention that he can pay rent, purchase food, do all cartage, pay railage and commissions, and have sufficient left to keep his



AYLESBURY.



PEKIN.

wife and family. Such poultry farming does not obtain in other countries because it does not pay, or because other occupations or industries pay better, and it is much less likely to pay under Australian conditions, which frequently affects the food bill to at least 100 per cent. above the normal. A forcible illustration of this is in evidence at the time of writing. Wheat is quoted at 3s. 9d. per bushel, while the offal from this same wheat—pollard—is 1s. 6d. per bushel of 20 lb. In other words, 60 lb. of the best wheat is obtainable at the above figure, the same weight of pollard costing 4s. 6d. In other countries, the price of wheat always regulates that of its offal—bran and pollard—which are, both in England and America, about half the price of the cereal from which they are obtained. I have no faith in poultry farming as a sole industry, and will again urge all immigrants or new arrivals to avoid being cajoled into investing their money in such ventures.

**Farmers
Feed Fowls
Cheaply.**

There are a few in the immediate suburbs of Sydney, who, under certain conditions, are making a living by keeping fowls and a very large number of orchardists, market gardeners, artisans, and suburban residents who make poultry keeping a profitable adjunct issue to their other operations, but none have such opportunities and facilities for doing well with fowls as have the settlers on the soil. Whether the locality and other

conditions favour wheat, maize, oats, or barley and potatoes, or a rotation of crops, dairying or other agricultural operations, the farmer is in a position to make poultry-keeping, not only pay, but pay handsomely; indeed, of the entire community who keep fowls, none have the elements necessary for the well-being and profit-making of poultry as have the farmers of this State.

The suburban breeder has to purchase dearly, or pay a high rent for his few acres and cottage, purchase everything the fowls eat, and otherwise conduct his operations under discouraging conditions. The man on the land, on the other hand, has every essential at command to make this auxiliary a success. There is actually no rent to pay for the fowls, the housing can be of the simplest kind, the material being all obtainable on any ordinary holding, while if cereals are grown there is always a quantity of light grain which can be most profitably fed to fowls; and the fact that the fowls, running free, have access to seeds and weeds, further reduces the feed bill. By running in a paddock the fowls obtain worms, slugs, grasshoppers, and other insect life which contribute largely to increased egg production. Again, there is no charge for labour, while the poultry products can be carted to rail with other produce of the farm. Poultry at liberty on a farm have an ideal life, and if a beginning be made with healthy vigorous stock, and the minimum of attention in the way of plain food, cool clean drinking water, and airy roosting quarters is given, there need be no fear of disease. The agriculturist of all others is the one who should be able to make the keeping of fowls a profitable industry. He has the labour in his own family, free land for the fowls, and food at the minimum of cost, the only outlay being a few pounds for the initial cost of stock.

**The City
the
only Market.**

I am quite aware of the fact that in this as in other Australian States the only market for poultry products is in the capital; consequently, when the farmer is at a great distance from Sydney there is the disadvantage of increased cost in

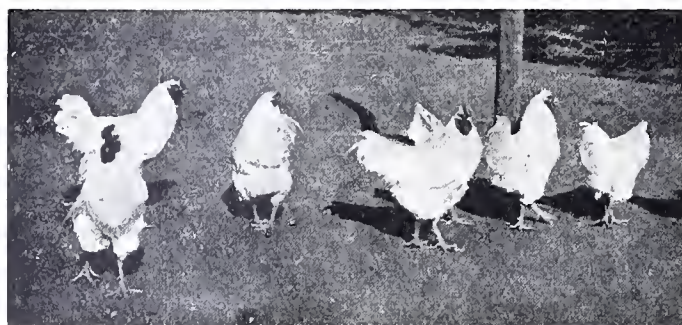


SILVER-LACED WYANDOTTES.



WHITE WYANDOTTES.

railage, but the this still leaves advantage over breeder. In poul-farmers the mar-porant element. ally, during the of each year it is for the city poul-



A PEN OF COCKERELS.

sufficient even moderate quality goods to supply their shop trade demands, a dozen plump $4\frac{1}{2}$ lb. weight chickens being unobtainable at any sales, and when a few of fair quality appear, from 6s. to 7s. per pair is usually realised. After January the quantity increases, and the quality also improves; but, unfortunately, from the beginning of the year, and for many months, the demand for good quality is so meagre that the breeder of choice chickens to put on the market at this period frequently does so at a loss, and gets discouraged.

set-off against the farmer at an the suburban try-breeding for ket is an im-Speaking gener-last four months almost impossible terers to secure

Breed for the High-Price Months. However, I have shown that the food handicap will scarcely apply to the farmer, the light grains being kept for this purpose, and by breeding only for the few months when prices are not only good but considerably better than that obtainable for the same quality in England, he should do well.

The farmer arriving here will also find some advantages which do not obtain in the land he has left, one being that wherever a railway station is to be found in the State, the Railway Commissioners, on a request from the producer, supplies him with coops free of charge in which to carry his fowls to Sydney. These coops are large and airy, and of a design calculated to ensure safe delivery at the Sydney sale-room. The following are the rates charged by the Commissioners :—

For each small coop capable of holding about

12 PAIRS OF FOWLS OR DUCKS.

	Rate.			Rate.	
	s.	d.		s.	d.
Up to 50 miles ...	2	6	176 to 200 miles ...	6	6
51 to 75 „ ...	3	6	201 to 250 „ ...	7	0
76 to 100 „ ...	4	6	251 to 300 „ ...	7	6
101 to 125 „ ...	5	0	301 to 350 „ ...	8	0
126 to 150 „ ...	5	6	351 to 400 „ ...	8	6
151 to 175 „ ...	6	0			

And 6d. per coop for every additional 50 miles or part thereof.

For each large coop capable of holding about

8 PAIRS OF TURKEYS OR GEESE.

	Rate.			Rate.	
	s.	d.		s.	d.
Up to 50 miles ...	3	2	176 to 200 miles ...	8	4
51 to 75 „ ...	4	5	201 to 250 „ ...	9	0
76 to 100 „ ...	5	8	251 to 300 „ ...	9	9
101 to 125 „ ...	6	4	301 to 350 „ ...	10	5
126 to 150 „ ...	7	0	351 to 400 „ ...	11	8
151 to 175 „ ...	7	8			

And 8d. per coop for every additional 50 miles or part thereof.

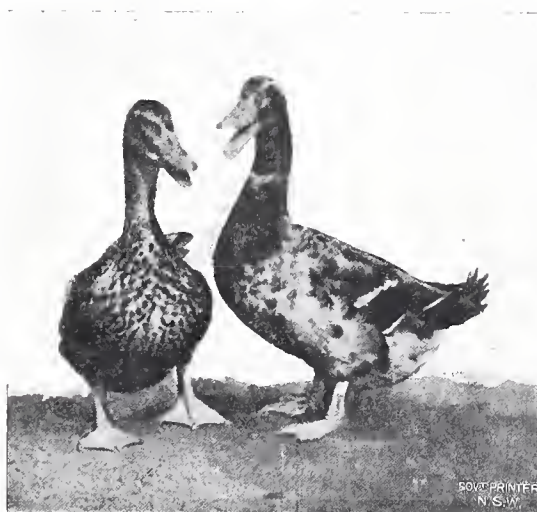
From this it will be seen that a settler on Myall Creek Estate can, from the furthest of the three railway stations—Mount Russell, 492 miles,—have his coop of twelve pairs of fowls or ducks conveyed to Sydney for 9s. 6d., or $9\frac{1}{2}$ d. per pair, a mere trifle in comparison with the enumerated advantages. At the same time it must be borne in mind that I only advocate the Sydney markets

within the four or five months mentioned, for the prices in the other periods of the year are scarcely payable. But should the proprietor lay himself out to cater for the good trade by supplying plump young fowls of from $3\frac{1}{2}$ lb. to 4 lb. weight, he can calculate on a net return of 5s. per pair, for at least four months of the year. Appended are the average monthly prices for ordinary poultry for the years 1900 and 1904, the encouraging feature being that the mean prices for fowls in the latter year was 10d. per pair more than in 1900. Ducks also considerably improved in price, while geese averaged 6s. a pair as against 5s. 5d. four years ago; turkeys realised from 11s. up to 20s. 9d. per pair:—

	Fowls.		Ducks.		Geese.	
	1900.		1904.		1900.	
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
January	2 9 $\frac{3}{4}$	4 6	2 7 $\frac{1}{4}$	3 9	4 3 $\frac{3}{4}$	7 0
February	2 4	3 6	2 1 $\frac{1}{2}$	2 9	3 9	5 0
March	2 6	3 6	2 4 $\frac{3}{4}$	2 9	3 6	5 0
April	2 6	3 6	2 6	2 9	4 3	5 0
May	2 6 $\frac{3}{4}$	3 6	2 6	2 9	5 1 $\frac{1}{2}$	5 0
June	2 7 $\frac{3}{4}$	3 6	2 6 $\frac{1}{2}$	2 9	4 7	5 0
July	2 7 $\frac{1}{2}$	3 6	3 0	3 3	5 4 $\frac{1}{2}$	5 6
August	2 11	3 3	3 9	3 3	5 6	6 0
September	3 4 $\frac{1}{4}$	3 4	3 10 $\frac{1}{2}$	3 6	6 10 $\frac{1}{2}$	6 3
October	3 3	4 3	3 8 $\frac{1}{4}$	4 0	7 3 $\frac{1}{2}$	6 3
November	3 3 $\frac{1}{2}$	4 0	3 6 $\frac{1}{2}$	4 0	7 6	6 6
December	3 11 $\frac{1}{4}$	3 9	3 10 $\frac{1}{2}$	3 6	7 3	7 0

The above are the average prices and they have no bearing upon the 6s. and 7s. per pair for prime quality fowls previously quoted.

In order to secure, say, 100 cockerels for the Sydney markets during the **Egg-producing** period of good prices, it will be necessary to hatch more than twice that number, seeing that approximately the half of the quantity reared will be pullets, and, however male birds be, to keep production will be a weekly income; and, State is concerned, ex-the egg side of the far the best paying one. 100 pullets, say, six or February or March of them laying in the and May, when eggs to 1s. 8d. per dozen. hens which failed to during the winter



ROUEN.

profitable marketing the pullets for egg pro-guarantee of a regular so far at least as this perience shows that poultry industry is by The farmer who has seven months old in should have the bulk latter month, April, are worth from 1s. 4d. The flock of 100 young return 20s. per week months would be

performers of the very worst type. Hens must never be kept after their second year's laying, as after that they are not profitable. This obliges the farmer to continue breeding operations each year, marketing the cockerels, and after the second season drafting the two-year old hens to market to make room for the younger ones to fill their places.

Concerning the marketing of the eggs, the Railway Commissioners, as with poultry, come to the producers aid. They carry eggs at half the ordinary rates to the Sydney markets, and convey the empty returns from Sydney to the remotest railway station free of cost. Further than this, as the greatest quantity of eggs will be produced in spring, when the ruling price of 5d. or 6d. per dozen is unremunerative, the Agricultural Department comes to the poultry farmer's aid by providing cold storage, where the eggs can be safely kept in a perfect state until their value doubles. A nominal charge is made for the accommodation. A 36-



BLACK ORPINGTONS.

dozen case of eggs is carried on the Government railways at the following rates:—Up to 100 miles, 1s. ; to 200, 1s. 9d. ; to 300 miles, 2s. 3d. ; to 400 miles, 2s. 6d. ; to 500 miles, 2s. 9d. A resident in the State 500 miles from Sydney can have his case of eggs conveyed to Sydney for three farthings a dozen—an amount which, so far as expense is concerned, places him on an equality with those in the remote Sydney suburbs.

The new comer from other countries will, no doubt, experience some difficulty with the various egg quotations of the daily papers, "Norths," "Souths," "Prices of Eggs." "Railway," "New Laid," and at some seasons "Cold-room," all being quoted.

What are known as New Laid are from the suburban poultry farmers, orchardists, and others, who bring in a few dozen each sale day. These are rarely more than one week old. They embrace small lots of from three to ten or twenty dozen, and are usually purchased by boarding-house keepers, and grocers who have a special trade for the best goods. They bring 1d. to 1½d. per dozen more than any others offered. "Railways," as the name indicates, come by rail, mostly from farmers along the railway route. These are usually of good quality, and come next to new laid in price. Following these are "Souths" or South Coast. These come from the various ports of call south of Sydney, beginning at Wollongong and extending to Eden. "Norths" or Northern Rivers, come not only from the North Coast, but in some instances a 100 miles or more away up the extreme reaches of Northern Rivers—The Tweed, Clarence, Richmond and others.

In the winter season, not more than 2d. per dozen separates these from the suburban article, but in the hot weather they range as much as 4d. below. The "Cold-room" eggs are

those which have been in the chilling rooms, say, from September to the dear time in May and June, and usually bring from 1s. to 1s. 4d. or more per dozen. The following is the average monthly prices for the three principal lines during the past year :—

	Jan.	Feb.	March.	April.	May.	June.	July.	August.	Sept.	Oct.	Nov.	Dec.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Norths ...	0 11 $\frac{1}{4}$	1 0	1 2 $\frac{1}{2}$	1 4 $\frac{1}{2}$	1 5 $\frac{1}{4}$	1 2 $\frac{1}{2}$	0 11	0 8	0 7 $\frac{1}{4}$	0 7	0 5 $\frac{3}{4}$	0 7 $\frac{3}{4}$
Souths ...	1 0 $\frac{3}{4}$	1 1 $\frac{1}{2}$	1 3 $\frac{1}{2}$	1 6 $\frac{1}{2}$	1 7	1 3 $\frac{1}{2}$	0 11 $\frac{3}{4}$	0 8 $\frac{3}{4}$	0 7	0 6 $\frac{1}{4}$	0 7 $\frac{3}{4}$	0 8 $\frac{3}{4}$
New Laid	1 3	1 4 $\frac{1}{4}$	1 6	1 10	1 9 $\frac{1}{2}$	1 6 $\frac{1}{4}$	1 2	0 9	0 8 $\frac{1}{4}$	0 7 $\frac{1}{4}$	0 9	0 10 $\frac{1}{2}$

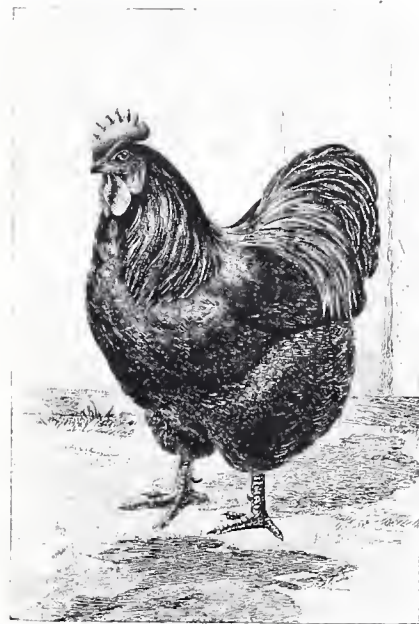
The average price for the past four years was—in 1901, 1s. ; 1902, 1s. 4d. ; 1903, 1s. ; 1904, 1s.

He who purposes breeding fowls for profit need give little heed to breeds beyond Orpingtons and Wyandottes. Leghorns certainly will lay excellently, and are small feeders, and did every egg produce a pullet they might be recommended, as there would not then be any small cockerels to market. Langshans are also good layers, and make at a late age big carcasses, but are lanky for the table. Wyandottes are good all-round fowls, but the farmer does not require a breed with which extreme watchfulness is necessary to keep the

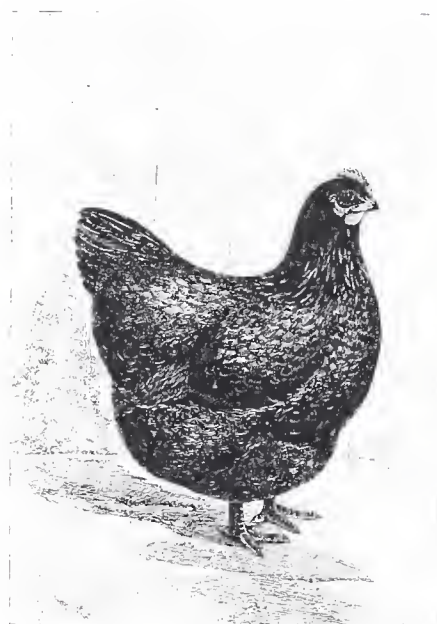
**The
Most Suitable
Breed.**

colouring correct.

Whites, of course, have not this handicap, and if the farmer's taste favours white fowls, then the Wyandotte of this colour should be adopted. However, taking the widest view of the situation, I believe Orpingtons will give the best results. Buffs are as good as any, but get washed-out looking in appearance when exposed to an Australian sun, leav-



TYPICAL BLACK ORPINGTON COCK.



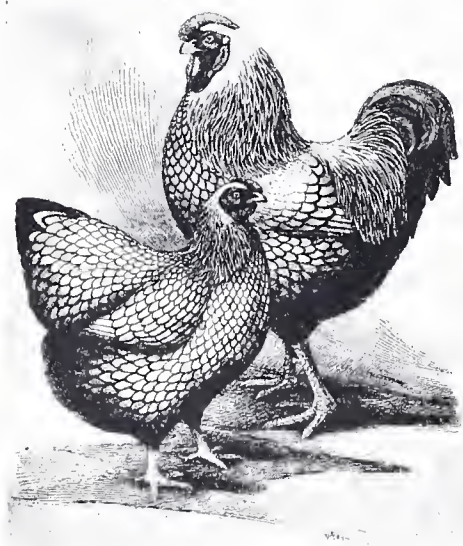
TYPICAL BLACK ORPINGTON HEN.

ing blacks as my recommendation to the immigrants, farmers, and other settlers on the land ; and should any of these people fail to make poultry-breeding pay, they can rest assured that the breed is not at fault. As egg producers, the Hawkesbury College 1904-5 competition showed that 108 Black Orpingtons produced an average of 159 eggs each for the twelve months, the same

number of Silver Wyandottes having 145 each to their credit. At the Dookie (Victoria) College competition, six Black Orpingtons secured third place with 1,228, these being bred in Wagga, in this State. The same breed secured fifth place at the Hawkesbury College contest with the good record of 1,155, and were bred at Gosford, showing that environment affects them but little; while at the previous College contest, out of seventy lots, Black Orpingtons secured second position with 1,274 eggs for the six hens. These results show that, whether taken collectively as a breed, or as strains, the records conclusively show that they hold a superior position as egg producers. Further, however good the above records be, they are likely to be exceeded in the present year, 1906, at a contest being held on the farm of Mr. J. McIntosh, Rockdale. The place is a hot sand bed. Still Black Orpingtons occupy the highest position of the competing fifty pens. Six hens have laid in eight months the extraordinary number of 152 eggs each, and are closely followed by another six which have laid slightly over 148 eggs each, several others of the same breed closely following.

In speaking of this breed as a table fowl, I will content myself with quoting **The Table Bird.** the following letter from Mr. C. E. Brook, poultry salesman, London, relative to a number of Orpington chickens exported some years ago:—

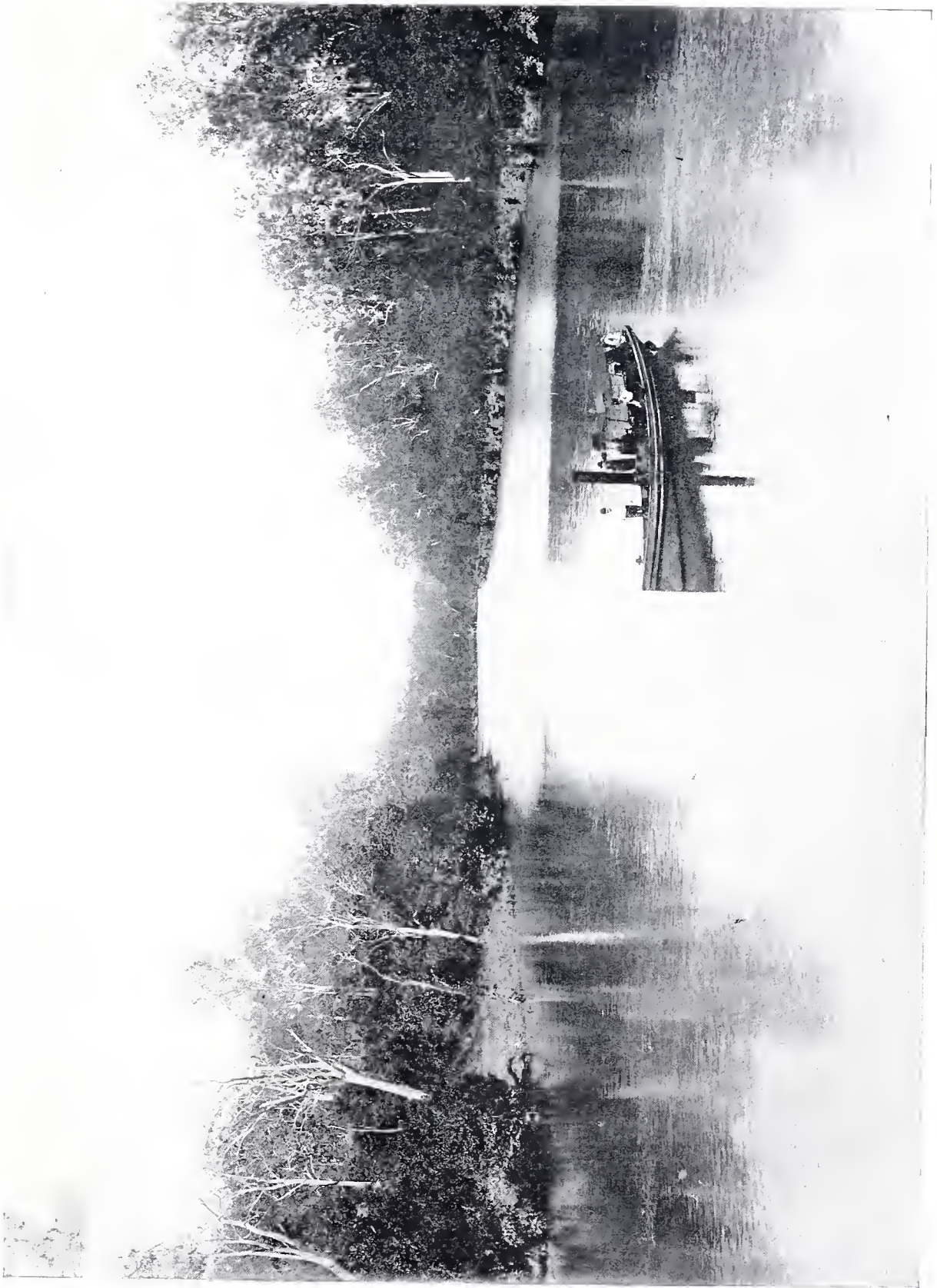
“The chickens, *ex* ‘Australasian,’ made 4s. each, and were very fine. Only get them here earlier and any quantity can be sold at from 4s. to 5s. each with no difficulty. They are the finest frozen chickens that came to our market, and the way they have been killed, dressed, and prepared is deserving of every praise. Although there have been large quantities of Canadian, Russian, Hungarian, and other varieties, there is no comparison between them and the chickens that come to us from Australia. I hope you will be able to get us large supplies for the forthcoming season.” The chickens referred to were shipped by Messrs. Boyd of Gosford, Gray of Paterson, and Hoffman of Parramatta.



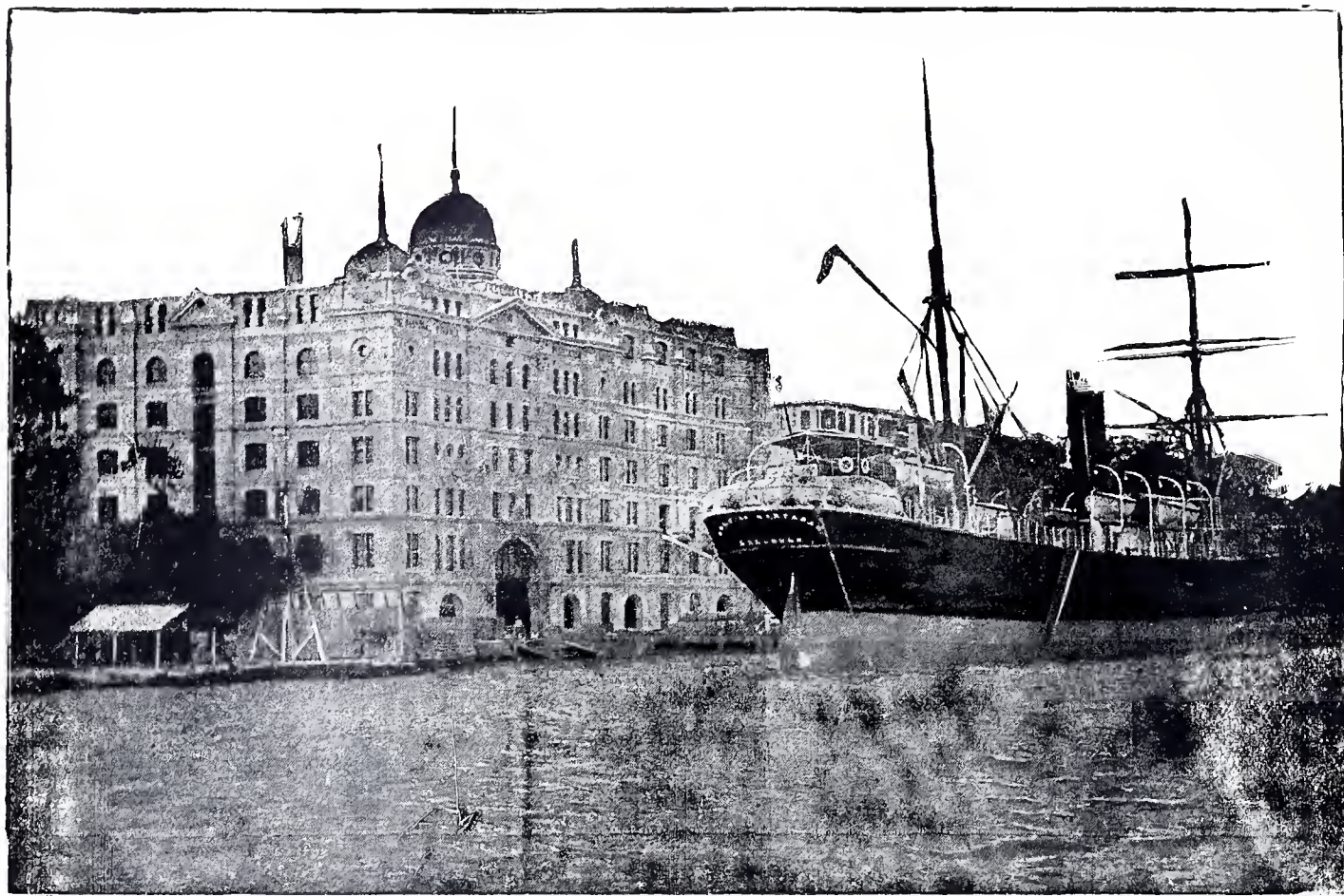
TYPICAL SILVER-LACED WYANDOTTE COCK AND HEN.

Nothing has been said in this article about hatching and rearing. This is an extremely simple process, and I feel sure, whether the immigrants be experienced agriculturists or farm labourers, they will be acquainted with the way to set a hen; nor is there any mystery in rearing chickens, the simple bread crumbs and household meals being ample in infancy, while the chickens of larger growth will thrive on the usual available foods of the farm.

Those requiring further information on the subject of breeds and breeding, storing of eggs, and other information or literature on the industry will be supplied on addressing Mr. H. V. Jackson, Officer-in-charge, Government Export Depôt, Sydney.



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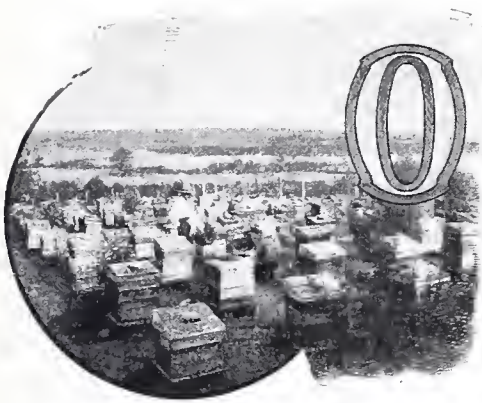
Manager, T. C. BOYD.

CHAPTER XXIII.

Bee-keeping

As an Aid to Settlement on Mountain Lands.

By W. HESSEL HALL, M.A.



ONE of the most valuable assets of any State is to be found in its mountain lands, and in the hardy and healthy men and women that they nourish. In New South Wales this class of country has been undervalued by settlers in the past, and still remains in the hands of the State. These broken lands extend in a broad belt running north and south right through the State, with an elevation varying from a few hundred feet on the foothills to several thousand feet on the higher ranges.

Included in this area is a considerable extent of table-land with an English climate—the richer portions of which are already occupied by settlers engaged in farming and pastoral pursuits; but the immense extent of broken country embraced in the mountain area is practically unoccupied.

Extending from about 30 miles, and often less, from the eastern seaboard to the edge of the western plains, the whole of this area lies within the rain belt of the State, with an average annual rainfall varying from 26 inches on the eastern and western foothills to 60 inches on some of the higher parts.

The soil varies from rich volcanic in parts, covered with dense semi-tropical vegetation, to poor shales and sandstones (overlying the Coal Measures), that require a close industry to yield a subsistence by ordinary methods of cultivation. At the same time even the poorest tracts contain innumerable sites where a home may be made and a family reared, within easy distance of the seaboard, and amidst the wholesomest, healthiest, and most independent conditions to be found anywhere on earth; provided only that the settler is content with a simple way of living, and to produce mainly for the food requirements of himself and family—relying on the sale of honey, timber, and in time on fruit-growing and dried fruits, for the ready money to procure the necessaries and small luxuries which he cannot produce for himself.

**Forest
Wealth.**

The whole of the mountainous region above described, together with isolated patches on the seaboard, and in various other parts of the State, is clothed with the native forest and indigenous undergrowth—these so far as the near future is concerned constitute its real wealth. Even the barrenest patches in the sandstone region—where the surface often consists of raw sand and rock—are densely covered with the various eucalypts and with innumerable wild flowering shrubs, mainly wattles and other leguminous plants, which being able to obtain their nitrogen from the air will grow and enrich the soil as they decay in spots where other vegetation unaided could not exist. With the value of many of these timbers, except for the settler's use for fuel, fencing, and building, this chapter is not specially concerned, though it may be remarked by the way that the procuring of timber from adjacent forest reserves for railway, building, and export purposes may well add to the settler's income from his own holding.

**Honey
Production.**

Those not familiar with this region can form no conception of the enormous quantities of honey produced by the native forest trees and flowering shrubs every year. Occasionally the yield takes the form of "manna," the honey or sweet sap exuding from small punctures made in the bark of the trees by the sap-feeding cicada, or dripping from the leaves till the ground is covered as with a light fall of snow with small white lumps of granulated manna honey. This form of honey production, however, is the

exception, and not the rule. The usual thing is for the honey nectar in the flowers. The members of the eucalyptus family have a little cup in the centre of the flower in which the honey is formed. Under favourable weather conditions, weather, the secretion is very abundant, and the secretion is very be distinctly seen shining in the flower-cups. Before the introduction of the honey-*Trigona* car the size of the house-fly, building stores the honey. Many of the especially parrots and parrakeets, with a brush at the end of the



GREY IRONBARK.

whom Nature has furnished the tongue with which they brush the honey out of the flower-cups. When the mountain forests are white with bloom, enormous flocks of shrieking parrakeets fly from tree to tree, revelling in the liberal supply of nectar, and deafening the ears of the passer-by with their din. English bees that have gone wild in the bush are now plentiful, and from their nests in hollow trees the settler may obtain a good deal of the stock necessary to start an apiary. But during the great honey flows which come almost every year, and sometimes many times in one year, the honey supply is so abundant, that much of it, even now, must needs go to waste for want of bees to gather it. In one of these flows about 130 colonies in the writer's



BLUE MOUNTAIN SCENERY.

apiary, last season, brought in two tons of surplus honey in a little over a week, while for a short time many more colonies might have done equally well. To take advantage of these abundant flows the art of the bee-keeper must be directed to having his colonies full of bees ready for work just at the right time.

**Honey-
producing
Trees.**

Among the honey-producing trees of Australia the eucalyptus family easily takes first place, both in respect to the number of species and to the quality of the honey produced. The somewhat prevalent opinion in the Old World that honey from the eucalypti is inferior and has a eucalyptus taste is purely a popular fallacy—the eucalyptus flavour residing in the leaves and bark, but never in the honey secreted from the flowers, nor in the manna

secretions. And if ever it is because it has been of eucalyptus extract by some cated honey. It is quite true are rank and unpalatable in from the apple or angophora (*Xanthorœa*), from blackthorn non-eucalypts. The most from a member of the laurel fortunately it is very seldom bees avoid it, except in time numerous members of the and types of honey are almost produce them, but the writer, experience, has found them all palatable and good, provided that they are properly ripened.



WHITE STRINGYBARK.

detected in commercial honeys, deliberately added in the form foolish compounder of medi- that some Australian honeys flavour, but these are derived family, from grass-tree (*Bursaria spinosa*), and other objectionable of all comes family (*Tristania laurina*), obtained in quantity, as the of scarcity. From the eucalyptus family the flavours as numerous as the trees that in a somewhat extended

Types of Honey.

The presence of so many sources of supply would lead the uninitiated to suppose that the honey obtained would be a hopeless mixture of all sorts ; this, however, is not the case. The various trees have their set times for coming into bloom, different varieties blooming at intervals right throughout the year. The honey from those that bloom in the winter and spring is mainly consumed by the bees themselves in the rearing of the spring broods, before swarming time. The great bulk of the surplus honey obtained comes from a comparatively small number of varieties. During the big summer and autumn honey-flows, with a little care on the part of the bee-keeper, the main yields can be extracted separately at the conclusion of each flow, and kept apart. In the case where two or more varieties are in bloom at the same time, if the honeys are of the same colour and type, they may be taken together. In the case where a flow from an inferior and a superior variety is on at the same time it will be found that the bees themselves do not mix the honeys, but that separate colonies gather from separate sources. If the bee-keeper will take the trouble to extract from the hives working on each kind separately he may still keep the good quality apart, otherwise the whole extraction must be graded as second-class honey. To prevent confusion each class of honey should be marketed under the name of the tree or trees from which it is produced.

Some Typical Honey-pro- ducing Trees.

Where the sources of honey supply are so numerous, it would be out of the question to attempt to describe every honey-producing tree in the mountain area, but a description of a few, the most widely-distributed and typical trees, and their honey product, may be attempted. Among the most important are the box family, found chiefly on the western slopes and plains. Of these the white and yellow box are the most important, though, strictly speaking, they scarcely belong to the mountain timbers.

White Box (*E. Bosistoana*).—The honey from the white box is water-white in colour, clear and limpid, with the flavour characteristic of the box family in its most delicate form. The honey from this tree is always sure of a market in Australia. Unlike nearly all pure honeys it does not readily granulate. This peculiarity makes it popular with the bottling firms, as it seldom requires to be melted before being bottled.

Yellow Box (*E. melliodora*).—The honey from the yellow box has the characteristic palatable flavour common to all the box family. In colour it is a rich golden tint. Like the white box honey it retains the liquid form for a considerable time, and is in every way equal to it.

Red Bloodwood (*E. corymbosa*).—This is one of the most widely-distributed and valuable of the mountain honey-producing trees. It blooms in the autumn, in February and



APPLE-TREE.

March, but not every year. Its habit is a general bloom one year, then a year of rest to mature its seed, then a year of light bloom, followed by the year of general bloom again. The large white flowers are carried in thick bunches on the tops of the branches. In the year of general bloom the trees are a beautiful sight, the mountains for miles appearing one mass of white-topped trees, while the air is laden with the rich honey perfume, and full of the din of the parrots and the steady roar of millions of excited bees tumbling over each other in their eagerness to gather the rich stores. When the weather conditions are favourable to honey secretion the honey flow becomes a honey flood. The bee-keeper, with every nerve a-quiver, must take up the pace set by the bees; must tier up the hives three and four and five storeys high, till four strong men could barely lift a single hive even a few inches for weight of honey; must work feverishly at the extractor to empty the combs and get them back to the hives for a further supply, till the roar of the bees and the whirl of the extractor get on his nerves and he longs for the comparative silence of night. But even at night the apiary is filled with a roar like that of a train rushing through a mountain cutting—the sound of millions of fanning wings driving the air currents through the hives to evaporate the surplus moisture from the nectar and turn it into rich ripe honey.

The honey from the bloodwood is of a clear rich golden colour, thick, rich, and of excellent flavour. If touched it will string out in long threads that will support the weight of a bee to the ground. Unlike the "box" honey it granulates almost at once after extraction into a creamy white crystal, nicer than the nicest of lollies, and can be eaten by the handful. If melted for bottling it will keep liquid for about six weeks and then granulate again. In districts where "*Angophora intermedia*" is not present the bloodwood honey is obtained uncontaminated by inferior sorts, and is suitable for export as its flavour appears to suit the English palate. Owing to its hard candying habit it is also particularly suitable for sale (candied) in the paper-bag trade, sweet for children it is produced by the bees also characteristic, being and unusually pliable, a wax for the finer grades without rival, and a great wax obtained from some

while as a wholesome unrivalled. The wax from bloodwood honey is bright yellow in colour, tough, and tenacious. As of foundation comb it is contrast to the brittle other sources.

Grey Gum (*E. punctata*). fine honey-yielder. It that has been written of might also be written of belong to the golden bloodwood honey, and It crystallises speedily, crystal. During certain



SCHOOL CLASS PRUNING.

—The grey gum is another blooms in January. Much red bloodwood honey grey gum. The honey class, is very similar to of about equal quality. forming a fine hard white years the honey-flow

partly overlaps the flow from white apple "*Angophora subvelutina*," and at the commencement of the flow is liable to be deteriorated by the red colour imparted; the bulk of the crop, however, is obtained in excellent condition, and is suitable for table use or for export. The grey gum follows the usual cycle of "general bloom," "miss," and "light bloom."



DATE PALM, PERA BORE.

Moreover, it is one of the trees that occasionally yield manna honey, which appears to be very similar to the honey obtained from the blooms. On trees near his home the writer has observed the bees gathering from the cicada punctures, and on swarming up the trees to examine has found the flowing sap to be sweetish in taste. In one case in a gully behind his house he has seen the ground under the grey gum covered with the little white lumps of crystallised manna, as described earlier in this chapter. Things hum along pretty fast in the apiary when grey gum is in bloom.

Sydney Peppermint (*E. piperita*).—This tree is very common on the sandstone country, growing freely on the most rocky and barren spots. It blooms in December, producing considerable quantities of excellent honey, which speedily candies hard to a watery white crystal. The honey belongs to the golden class, is mild in flavour, and is suitable for table or export.

Grey Ironbark (*E. paniculata*).—This is a widely distributed tree very valuable for its bark and timber. It blooms every other year in the spring, and the honey it yields is invaluable in building up the colonies just before swarming time, besides giving considerable surplus. In colour the honey is a brilliant golden hue. It candies speedily into firm bright yellow crystals; the flavour is excellent. In appearance the honey resembles that from the orange blossom, but it is not so rich in flavour. In the writer's apiary, which overlooks an orange-growing district, the two honeys often come in at the same time, and as they go very

well together, the milder ironbark honey toning down the excessive richness of the orange blossom flavour, it is his practice to harvest them together.

White Stringybark (*E. eugenioides*).—This tree is an excellent honey producer, but is most erratic in its habit of blooming, sometimes blooming two years or more in succession, and sometimes missing for several years together. Another peculiarity is that sometimes the trees flower together, but more often drop in one after the other for several months at a time, while the season for bloom varies from midwinter to mid-summer, thus enabling the bees to secure most of the honey that is secreted. The honey is mild and palatable. It belongs to the golden class, but with a slightly greenish tinge. Unlike nearly all mountain-produced honey, and indeed nearly all pure honeys, it does not readily candy, but retains its liquid form from season to season. The honey from this tree sells readily in the local market, being readily purchased for bottling owing to its good general quality and its non-granulating habit.

White Bloodwood (*E. eximia*).—This tree comes into bloom in October. The honey is not of first quality, having a brownish tint and somewhat coarser flavour than the others described. This fact, however, is of very little significance, as the tree blooms at swarming time and nearly all the honey it produces is consumed by the bees in brood-rearing. It is very valuable to the bee-keeper owing to the enormous quantities of rich pollen that it produces,



WAGGA WAGGA FARM.

the abundant food causing the bees to breed enormously and to swarm heavily. If a swarming strain is kept, the year of general bloom means busy times for the bee-keeper, and will drive him nearly distracted (if he is short of capital) with the effort to provide homes for the enormous swarms that are constantly being thrown off. A good White Bloodwood bloom puts the colonies into splendid order to deal with flows of better-class honey later in the season.

Two members of the angophora or apple family may be described, as this family produces the bulk of the inferior honey which is often attributed to the eucalypts :—

Red Apple (*Angophora lanceolata*).—This is a very widely-distributed and handsome tree, with smooth red bark leaves. It is commonly, but it is a true apple, and differs and in every other respect *rostrata*), a very valuable tree to flood on the western rivers, wildest of the sandstone great size when it finds a of some gully. It blooms in three-year cycle. The flowers carried on the tops of the with a glorious head of white honey abundantly, but the distinctly inferior—it has the extracted separately has a unlike that of burnt sugar.



RED APPLE.

and beautiful crown of green erroneously, called red gum. in timber, honey, and habitat, from the true red gum (*E.* which favours the flats subject The red apple grows in the country, often attaining a patch of deep soil on the side November and follows the are white and large, and are branches crowning the tree blossom. The flowers yield honey, though wholesome, is colour of red ink, and when strong coarse flavour, not As far as possible this honey

should be kept separate and sold for industrial purposes, or reserved for feeding back to the bees in occasional times of scarcity.

White Apple (*Angophora subvelutina*).—This is another very large-growing and handsome tree. It yields an abundance of dark-red honey, with the burnt-sugar flavour, coming into flower a little before Christmas; in the year of its bloom it deteriorates a good deal of honey from overlapping flows. The objectionable flavour is very much toned down when largely admixed with other honeys, but the dark colour persists; still, as it keeps liquid fairly well, it finds a fair sale as second-class honey. The honey from both the red and white apple cause the bee-keeper a good deal of annoyance by reducing the grade of better qualities, and he sometimes wishes the trees could be destroyed, but if honey has been scarce for a time, and the colonies are short of stores, he is profoundly thankful to have it for the use of his bees.

Much of the honey that gluts the local market at times contains a large admixture from various members of the apple family, and some satisfactory method of turning it to account would be of great service to the bee-keeper. Cannot its use in the manufacture of vinegar be extended? Some of the very best vinegar the writer ever tasted was made in his

household from such honey (chiefly scraps washed out of honey tins) diluted with water till a new laid egg would barely float, poured into stone jars and left to ferment and ripen for two years, then bottled off for use. Cannot the sugar-refining companies discover some cheap method of refining it, extracting sugar from it, or otherwise turning it to profitable account? A satisfactory solution of this problem would lead to an immense extension of the bee-keeping industry.

In dealing with the problem of settling the mountain lands the possibilities of honey-production are too important to be overlooked. One of the chief difficulties to be faced is that the settler with plenty of capital prefers to settle where the land is rich and will have a value for sale when improved. Generally he does sell after a few years, and then cries out for more land, that he may repeat the process, till no more good land is available. The man with small capital on the



ON WYONG CREEK.

other hand, especially in second-class country, is apt to be starved out before he can make his holding productive enough to supply him with a living. It is to the man with small capital, who wants land for a permanent home, that bee-keeping offers a helping hand, as it requires but little capital, and brings in an immediate money return from the honey gathered from the native forests. The ordinary farmer, finding the native timber in his way, must laboriously clear, fence, and plough, before he can put in his crop, but the

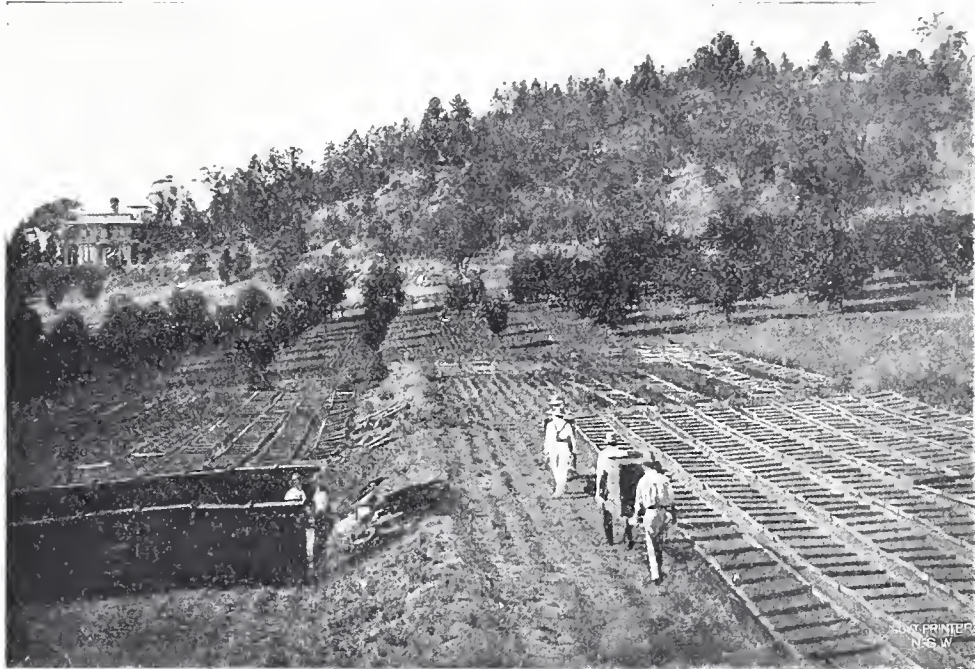
bee-keeper finds the forest his storehouse and treasury before putting axe to tree; while the small area he needs for cultivation round his home can be cleared and improved at leisure. The settlement of the mountain lands and bee-keeping must go hand-in-hand. In open country the industry is precarious, but in the mountains the broken nature of the country, and the need for the extensive timber reserves which State policy requires, prevent the danger of the bees being deprived of their food by the extensive clearing and ringbarking that takes place on the open country that is suitable for extensive farming and grazing pursuits. The writer, with limited capital to start with, has made a modest living for the past ten years on as rough and poor a patch of land as can be found in the mountain area; by the help of his bees gradually improving the land, and preparing the way for fruit-growing, so that he knows from experience both the difficulties and the advantages of this class of settlement, and after

ten years of experience he would not change the free wholesome life for one on the richest land on the plains—much less would he care to return to that of the city.

Essential Conditions.

In order that settlement may be successful in the case of men of limited capital, certain conditions are essential. The State must be satisfied to find its gain in increased population, with its attendant advantages for trade and for national defence. Instead of stripping the intending settler of his small capital in the purchase of land, it must offer him inducements to settle by granting him favourable terms that will give him a chance to make a home and a living. As the supply of mountain land is abundant, a fair area should be provided for each holding.

The writer suggests an area of from 100 to 160 acres, untrammelled by unnecessary clearing conditions. This area will supply fuel, fencing, and building material, rough pasturage for a few head of stock for food and milk supply for the settler's family, a small area in time for



DRYING PRUNES.

cultivation—growing mainly for home use, and an area in time—when highly improved—for fruit-culture, for apples, vines, small fruits, and for dried fruits. To afford the settler an opportunity of establishing himself, the land may be a gift, or preferably should be given on “perpetual lease,” *rent-free for say twenty years*, and afterwards bearing rental at 4 per cent. on its “unimproved value,” which on this class of land would generally be a nominal thing. Where a settler wants land for a home, and not to make money by trafficking in land, this form of tenure is equal to freehold, securing to the settler as it does the ownership of improvements and the right to subdivide and sell the whole or any part of his interest. And as this class of settlement will produce very little revenue from taxation, it is just to the State and no hardship to the settler, that after the lapse of the twenty years (time to rear a family) he should pay the small unimproved rental value as a contribution towards the cost of governing the country. In choosing the locations it will be necessary to plant the settlers on the ridges

and more favoured spots, while the gullies and rough portions may be set apart as permanent timber reserves. Care should be taken to survey sites in suitable localities before settlement is invited.

Grading and Export.

One other matter must not be overlooked. The State, in view of the stagnant condition of the local honey market, must encourage the grading of honeys, so that, with the increase of production, a steady supply of the better types shall be available for export. Also, it must provide standard samples of these honeys for exhibition and sampling in outside markets, so that foreign purchasers may be assured of steady supplies of standard types. At present, though we have low prices and severe gluts of inferior honey, we cannot guarantee a steady supply of standard quality. And even where good honey is sent abroad, if one type and flavour is sent one time and a totally different type and flavour the next time, business becomes impossible. But by having standard types (named after the source of supply) on exhibition (to taste as well as to look at), the prejudice—largely groundless—against Australian honey may be broken down, and the way opened for a permanent export that shall place the industry upon a solid basis, and allow for indefinite expansion.

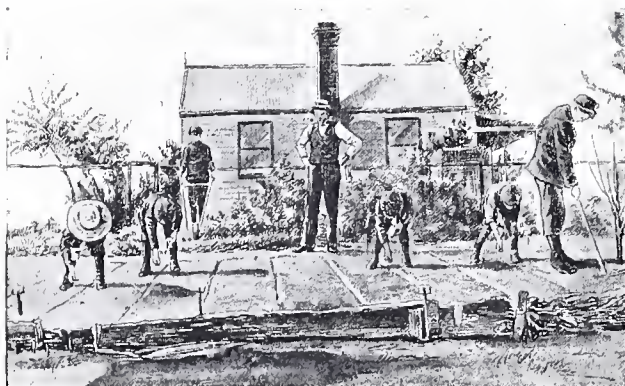
As a means of dealing with the large supplies of inferior honeys that glut the market, relief may be sought in more careful methods of harvesting, and by encouraging the use of lower-grade honeys as a fattening ration for all kinds of stock; while the bee-keepers themselves may do much by keeping the inferior honeys separate as far as possible, and turning them into bees to gather better honey when good quality flows are on.

A description of the methods of modern bee-keeping cannot be attempted in the space at the writer's disposal, but a few hints may be of service to intending settlers, whose experience and capital are limited.

Location of Apiary.

The common practice is to choose a home and then try to keep bees upon it. Such a plan often results in failure owing to the locality being unsuitable. The sensible man who intends to succeed will choose the spot that suits the bees, and then establish his home there. In choosing a location care must

be taken to keep four miles away from apiaries already established. With such vast areas of suitable forest country to choose from this can easily be managed, and is in the interest of the newcomer himself, as he will find it hard to build up his apiary in face of the competition of the populous colonies of his neighbours. An exception to this rule may be made where several families for the sake of company find it convenient to settle upon



SCHOOL CLASS SEED-SOWING.



APIARY, HAWKESBURY AGRICULTURAL COLLEGE.

a ridge or level tract in the mountains—away from other apiaries—that is surrounded on all sides by timber reserves and broken country not likely to be settled in the near future. It is desirable that the settler should pick the home for himself and his bees where a variety of good honey-producing trees are present, otherwise his bees may have a feast one year and a famine the next, as the same tree does not blossom every year. As far as possible the open country should be avoided, as such land is likely to be ringbarked and cleared by other settlers engaged in farming and grazing, and without the native forest the bees will not be able to find a living. If the home is made in a suitable locality, a well-managed apiary of from 100 to 150 strong colonies should yield an annual surplus of from 4 to 10 tons of honey, and about 100 lb. of wax beyond that required by the bee-keeper for use as foundation comb. These figures are not the result of mere surmise, but are the outcome of a lengthy experience on the part of the writer. Good honey from the mountain area is worth on an average 2½d. per lb. wholesale, and should not be sold for less; but in years of glut should be exported or stored at the apiary to be sold in years when the supply is less abundant. In the year just ended (1905) the writer's crop of about 6 tons (120 cases) realised £150 gross, or about £125 net. Of this amount, about 4 tons (80 cases) were sold in the local market, and 46 cases were sent to fill export orders from South Africa, the writer receiving 2½d. per lb. in Sydney without risk. The quality of the honey exported (consisting of 20 cases of white stringybark honey and 20 cases from red bloodwood) was reported as having given satisfaction on arrival in South Africa.

The intending settler will be risking failure if he attempts to earn a living at bee-keeping without some knowledge of the habits of bees and the methods of work adopted in modern bee-keeping. Such knowledge can be gained in a few weeks from "Root's A.B.C.

**Need for
Knowledge.**

of Bee-culture," provided the reader has the brains to take in the information this work supplies, and the capacity to apply the information to his own ends. He will also need the faculty of selecting the methods that are suited to his own means and the conditions that apply in Australian bee-keeping. Unless he has plenty of capital, and indeed in any case, he will find a



SCENE ON COWAN CREEK.

knowledge of plain carpentering invaluable to him. If he has not that knowledge already he can soon acquire it, remembering that a determined man can do whatever he will. For the rest experience is the great teacher, and from his very mistakes the earnest man will learn the way to success. As a word of warning, the writer would say that the beginner must not try to increase his stock too rapidly. It is quite true that an expert can make one colony into six in a single season, as

the text-books teach, but the beginner is more likely to have lost one good colony and to have six empty hives when he has finished with the experiment. The golden maxim is keep your colonies strong and go slowly but surely.

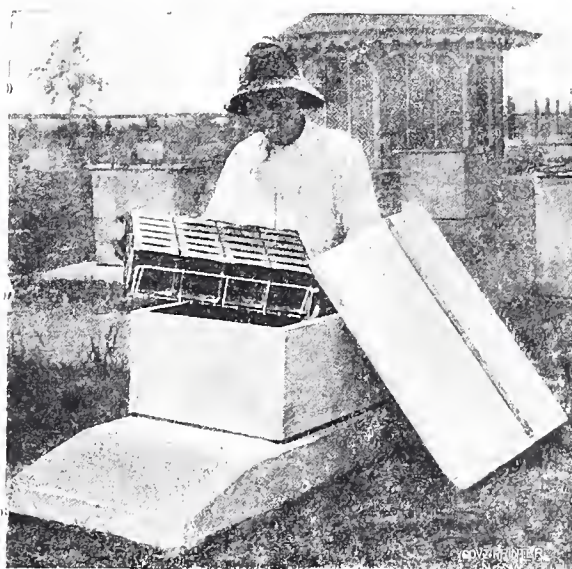
**Acquiring
Stock.**

Good stocks of bees in frame hives can usually be purchased in Australia at £1 per hive, but the man who is not overstocked and is prospering will not sell good Italian hives under double that money. Swarms of black bees can usually be bought in the season at from 2s. 6d. to 7s. 6d., according to size. Where possible it is well to buy swarms, as they carry no risk of disease. Colonies of black bees with comb, in the common gin-case, are worth about 5s. each. It is generally best for the beginner to buy black bees, put them in frame hives, and afterwards Italianize them. If bought in boxes with comb the bees may be drummed out, the combs (if healthy) cut out and transferred into frames, placed in the new frame hives, and queen and bees shaken in with them. When the colony has secured and mended up the combs and settled down, the queen may be removed, and a good Italian queen introduced in her place. Good Italian queens, either golden or preferably leather-coloured, may be bought—untested, 5s.; tested, 10s.; select tested breeding queens, 15s. each—from any of a number of reliable breeders in the State.

In forest country the settler can generally add considerably to his stock by cutting the nests of black bees, gone wild, out of the hollow trees in which they have built, saving the pieces

of worker comb, and brood, and transferring them to frame hives along with the bees, and then Italianizing as soon as they have settled down. For the rest a page out of the writer's own experience may best give the necessary information. First, knowing nothing of bees, he bought one hive—wicked hybrids—near relatives of the wasp in temper. To learn how to handle these fiends he bought "Root's A.B.C. of Bee-culture," and soon learned a good deal about bees. Several black swarms were given to him by friends. Next he purchased a good Italian queen, and breeding young queens from her replaced the wicked hybrids and blacks. When he had seven strong colonies he removed to another district, taking his hives 200 miles by rail. In the new district he bought a couple of stray swarms for a few shillings each, cut several nests out of hollow trees, and despite the loss of many fine swarms at swarming time through inexperience and failure to cut the queen's wings, in two years raised the total to thirty colonies. Then removing to the barren stony ridge—then in a state of nature—on which his home now stands, he trusted to the bees and to what he could grow on the stony land for a living for himself wife, and four young children. Obtaining the best strains of leather-coloured Italian blood, breeding, culling, selecting, he has now as fine a lot of thoroughbred queens and bees as can be found anywhere. By dint of clearing, trenching, draining, manuring, and even sifting, the barren hill has been turned into a most fertile garden. For years he made his own hives out of the ubiquitous kerosene case, till the labour of harvesting the increased yields left no time for such work. So by ten years' hard work—earning before he ate—he has built up a home in which he is satisfied to end his days. The same opportunities, and much better, are open to thousands of others, and if the State will help, on the lines indicated in this chapter, the struggle need not be so hard as it was at first for the writer.

In concluding this chapter the writer would say that he is not a Government official, and has not written for hire. The life is one that he has lived, and is living still. He sought it rather than have his freedom of speech on political and social questions curtailed as in his former calling, and for the sake of the moral and physical health of his family. And he is writing in hope of benefiting the State by helping to solve the problem of settling the people on the land, and in the hope of helping others from the Old World, or those who desire to escape from city life in his own land to the healthful life of the mountains. He who has a stout heart and possesses industry and grit need not fear failure. He will not make a fortune, but room and work for every child, and a home and a living he may have. As a reward he will live a life most varied and interesting—



SECTION OF HIVE.

too busy to be dull—the years will slip by. He will call no man master. He will have busy times and times of leisure. In place of the monotony and confinement of city labour he will have work most varied, according to the time of the year,—clearing, splitting, fencing, building, with material from his own land, beginning, if need be, with a sheet of bark or slab hut, and ending with as good a house as his skill or means can construct. Hive-making, queen-rearing, uncapping, extracting, soldering, marketing, ploughing, or digging, trenching, draining, planting, reaping, mowing, harvesting, pruning, grafting, budding, picking fruit, packing; all these and others go to make up the life of the mountain home. Though not rich, the settler, like the writer, may have many good things from his own labour—peas, beans, pumpkins, marrows, cabbage, cauliflower, turnips, parsnips, and other vegetables from his own garden in plenty. Honey and honey-comb in variety and abundance, milk, cream, butter, eggs, and bacon of his own curing. From his few trees, peaches, plums, nectarines, apricots, apples, passion-fruit, oranges—more than he can eat; strawberries and cream for all till they can eat no more; the choicest of grapes in abundance—things that the richest cannot buy so fresh and good. His children growing up hardy, deep-chested, and innocent, taller and stronger by far than their parents, may follow in their father's steps, or in after time in other callings rise to eminence in the land. To the men and women who fear God, seek knowledge, and are patient in industry, all these things are possible “on the mountain lands.”

[EDITOR'S NOTE.—As there is no officer in the Government Service at present who has had a long practical acquaintance with bee-farming, Mr. Hall was asked to contribute a chapter for the “Immigrants' Guide” from his own successful experience. Though some parts of the article are more allied to public land-policy than to bee-keeping, it has been felt to be unfair to impair the force of Mr. Hall's argument by eliminating them as irrelevant, and the whole is therefore presented as the expression of opinion of a successful settler of more than ordinary intelligence.]



PICKING APRICOTS.



GENERAL VIEW OF MR. HALL'S APIARY, BLUE MOUNTAINS.



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And New Ones suitable to Local Conditions—Imports that could be Locally Supplied.

By W. S. CAMPBELL, F.L.S.,

DIRECTOR OF AGRICULTURE.



IT seems quite possible that many of the minor branches of agriculture, that hitherto have been either wholly or partially neglected, will, before long, be taken up either alone or in conjunction with other larger and more generally known branches.

Doubtless some of these minor branches should prove highly profitable if they be taken in hand properly and with a will.

For instance, the cultivation of flax, both for fibre and seed, has proved remunerative in some parts of Australia to the few growers who have taken up its cultivation. In the early days of the Colony, Governor King encouraged the cultivation of flax and the manufacture of linen, and his efforts met with success. In the year 1800, from a small quantity of European flax-seed a sufficiency of fibre had been grown to make 279 yards of fine and 367½ of coarse linen. Every woman who could spin was employed from October, 1800.

An Industry For some unknown reason the cultivation of this valuable plant ceased, and the industry died out, not because flax would not thrive, for it grows well in suitable localities, and yields excellent fibre as well as fine seed.
Dropped.

Under the system adopted in an adjoining State of dew-retting and harvesting by means of a mowing machine, the old, difficult, and expensive methods of retting and pulling are unnecessary, and flax-growing has become profitable.

Should the supply of fibre or linseed ever exceed the demand in Australia, there is always a market to be found for any surplus in Great Britain or in Europe. The growing of flax, if only on a small scale on farms wherever stock are kept, deserves to be encouraged for the production of linseed for home use, for the seed is of considerable value for the use of stock, including pigs.

Another fibre plant, the real value of which has, until comparatively recently, been overlooked, is the *Phormium tenax*, known generally as New Zealand flax, although it is not a true flax. It is a native of New Zealand, and flourishes there chiefly about the margins of swamps and such like places. The supply of fibre was obtained from plants in their wild condition until comparatively recently; but now this plant has become so valuable that it is being cultivated to a great extent, and is highly profitable. This "flax," which grows well in New South Wales, deserves attention, and will probably, before many years have passed, become extensively grown in those localities where it will thrive best. Green flax realises in New Zealand at the present time about 12s. 6d. a ton, the purchasers paying for cutting and carting. The average yield is about 20 tons to the acre, the maximum being about 35 tons.

The cul-

Sisal Hemp. tivation of

"Sisal

hemp," *Agave rigida*, a native

of Yucatan, Central America,

should prove remunerative in

conjunction with dairying,

maize-growing, or sugar-cane

growing, for it is likely to

thrive well about the North Coast districts. It may also succeed in many other parts of New South Wales, but so far experiments have been confined to the north-eastern portion of the State.

Experimental samples, forwarded by the Agricultural Department to the Agent-General in London, have been well reported on by experts. The cultivation is easy, and the cleaning of the fibre by no means difficult. So far the industry has not been taken up by any of the



PERA BORE.

settlers, who appear disinclined to embark on any other industry than that of the production of milk, although the cultivation of the Sisal plant is well worth an extensive trial.

The mulberry silkworm succeeds admirably in this State, and excellent silk has been produced. Here, too, the white mulberry thrives like a weed, but so far the silk-producing industry has never advanced beyond the experimental stage. No doubt when population becomes denser this industry will be taken in hand successfully.



BROOM MILLET AFTER REAPING.

Cotton has been produced of excellent quality in many parts of this State, but no attempts have yet been made to produce it on a commercial scale ; still it is worthy of attention, and probably will, in the not very remote future, be taken in hand by settlers in connection with other crops. The growing of broom-millet is profitable to many of those who cultivate it, and who take the necessary care in its production. The cultivation and treatment of this fibre are by no means difficult, and can be carried out by any intelligent person. The price for the fibre varies considerably, and according to quality. One of the best varieties to grow is the "White Italian." The price of this ranges from 15s. to 35s. a cwt., and the yield of heads averages 15 to 20 cwt. an acre

The production of onions should, in suitable localities, prove remunerative, sometimes highly so, and the production of seed of high quality is well worth attention, the price ranging from 30s. to £2 and £3 a pound weight. The crop needs a good deal of attention, especially during the early stages of the plant's growth, and attention to the proper time for harvesting is also necessary. Loss is sometimes occasioned by harvesting before the onions are thoroughly ripe, the consequence being that they heat when bagged and marketed, and will not keep for any length of time.

**Other
Marketable
Products.**

The ground-nut, or pea-nut, grows well in many parts of the State, and should prove a profitable adjunct to other crops. But it is not grown to any extent here, and market requirements are met by large importations. Arrowroot, *Canna edulis*, grows like a weed in all the warm coastal districts of the State, and excellent arrowroot, for domestic purposes, is produced; but so far as is known, not for commercial purposes, although if the necessary care for its production for the market be taken, it should prove profitable. In the warmest of the coastal districts the true arrowroot, *Maranta arundinacea* and other species, will thrive well. The starch from this plant brings the highest price for arrowroot, and although the yield from it is not so great as that from the *Canna edulis* it should prove more profitable. The manufacture of the starch from the roots is simple in the extreme, and sufficient arrowroot for domestic purposes can be provided at the cost of but little trouble.

Tobacco. Tobacco of excellent quality has been and is produced in the State; and it seems almost certain that the tobacco plant will shortly be extensively cultivated in many districts, both for plug tobacco and cigar wrappers. But only tobacco of the quality required should be grown. The chief cause of complaint on

the part of purchasers has been in consequence of the production of tobacco of a rank and inferior quality, grown on very rich land; whereas that required by the manufacturers should be bright, light in colour, and well cured. Cigar tobacco can be



CUTTING SORGHUM FOR ENSILAGE.



LOADING HAY.

best grown near, but not too near, the coast. This tobacco, however, is not in so much demand as the plug tobacco. This industry is well worthy of the consideration of settlers or

would-be settlers, who are prepared to do the work necessary with care and attention.

The following products are also worth attention:—Wattle-bark, olive oil and preserved olives, cider, fruit syrups, orange, lemon, and citron peel, castor oil, sunflower-seed oil, and the basket willow.

The accompanying table shows the quantity and value of the various products men-



TOBACCO LEAF, TUMUT.

tioned, which were imported into New South Wales during the year ending 31st December, 1905. It also shows the quantity and value of those goods imported into Great Britain during the year 1904. It may be stated that there are large importations of the same products into other European countries.

IMPORTED INTO NEW SOUTH WALES DURING 1905.

	Quantity.	Value. £
Flax and hemp.....	28,124 cwt.....	46,052
Linseed.....	4,661 centals.....	2,208
Linseed oil.....	444,321 gallons.....	42,158
Linseed cake.....	509 centals.....	128
Cotton, raw.....	36,307 lb.....	677
Broom-millet.....	719 centals.....	678
Arrowroot.....	372,376 lb.....	3,817
Tobacco leaf.....	1,840,525 „.....	76,337
„ manufactured.....	1,581,792 „.....	136,003
Olive oil.....	10,252 gallons.....	2,448
Castor oil.....	170,273 „.....	17,468
Basket, cane and wicker ware.....	.....	5,192
Cider.....	1,755 gallons.....	325

IMPORTED INTO GREAT BRITAIN DURING 1904.

Flax.....	74,917 tons.....	3,185,475
Linseed.....	2,785,983 qrs.....	4,502,064
Linseed oil cake.....	180,817 tons.....	1,137,390
Linseed oil.....	3,136 „.....	55,784
Cotton, raw.....	17,454,897 cwt.....	54,697,788
„ yarn.....	4,959,738 lb.....	227,608
„ waste.....	28,481,194 „.....	327,037
Arrowroot.....	30,302 cwt.....	39,937
Tobacco (raw and manufactured).....	110,996,364 lb.....	4,512,378
Olive oil.....	15,010 tuns.....	508,458
Castor oil.....	60,881 cwt.....	69,885
Hemp, raw.....	127,456 tons.....	4,036,435
„ yarn.....	77,712 cwt.....	150,148
Basket, cane and wicker ware.....	244,568
Cider and Perry.....	613,786 gallons.....	22,463



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SOLE AGENTS

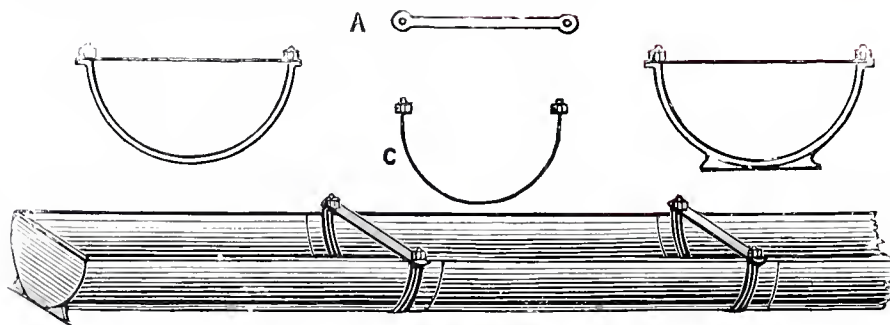
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**All kinds of Water and Irrigation Pipes
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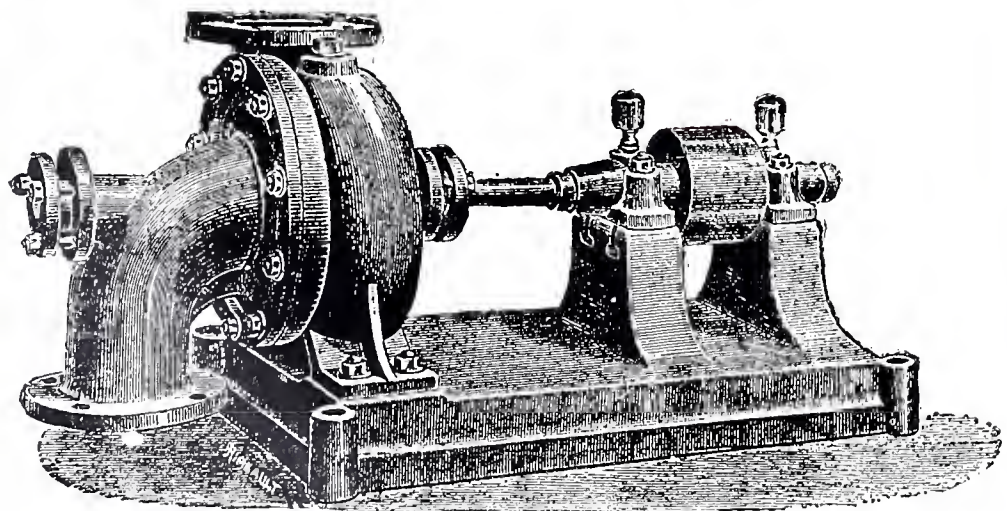
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Danks' Make Centrifugal Pump

Has special attachment which permits of the pump being set at any angle, thus
dispensing with bends, which gives more satisfactory results.

Irrigation and Water Conservation.

What has been done—Possibilities—Future Prospects.

By H. G. McKINNEY, M.I.C.E.

(FORMERLY CHIEF ENGINEER FOR WATER CONSERVATION).



It is not proposed in this article to deal with irrigation from the engineer's point of view, but from the standpoint of the pastoralist, the farmer, and the fruit-grower. Not many years ago a great majority of those interested in land in New South Wales were very decided in the opinion that while irrigation might be profitable in a country like India, where labour is cheap and abundant, it would be folly to attempt it here on account of the expensive labour and sparse population. These notions have, however, almost disappeared under the light [of recent experience, which has shown that irrigation can be carried on as successfully

with the expensive labour of the Western States of America as with the cheap labour of India.

As irrigation has been successfully tried in almost every district of New South Wales, it may fairly be regarded as having passed the stage of experiment. The most recent argument advanced against it is that even as far west as the river Darling, which is far outside the agricultural belt, crops can be grown with a fair degree of success in two out of three years. While this may be admitted in a general sense, the point of interest here is the net result obtained from unirrigated land in the western districts of New South Wales and irrigated land of a similar character and with a similar climate elsewhere. For the purposes of illustration, the experiences of a pioneer irrigator at Kerang (Victoria) may be taken and compared with results obtained at Narromine, New South Wales. I have selected a year in which the Narromine rainfall was slightly over its average, 21 inches. The cultivated land in the county of Narromine consists chiefly, if not entirely, of the rich alluvial land adjacent to the river Macquarie. The nature of the soil and general characteristics of the Wimmera District (Victoria) correspond in many respects with the conditions in the county of Narromine, and, therefore, the comparison is a fair one. The yield per acre of crops on unirrigated land in the county of Narromine was as

**Passed the
Experimental
Stage.**

follows :—Wheat, $10\frac{1}{2}$ bushels ; hay, 1 ton 2 cwt. ; maize, 25 bushels ; barley, 10 bushels ; oats, $28\frac{1}{2}$ bushels ; oaten hay, 1 ton 12 cwt. ; potatoes, 2 tons. The results obtained at Kerang as the result of irrigation were :—Hay, from 2 to 4 tons per acre ; wheat, never less than 20 bushels and up to 45 bushels ; oats, 40 to 70 bushels ; Cape barley, 30 to 52 bushels ; and potatoes, 9 tons. To summarise, it may be stated that irrigation in the Wimmera, as compared with cultivation on the Macquarie with the aid of the rainfall only, gave double the quantity of wheat, treble the quantity of barley, and more than four times the quantity of potatoes.

To illustrate further the character of the crops which western farmers obtain in good seasons from land of great fertility, the returns from the counties of Nandewar and Baradine for 1904 may be given. These counties include some of the finest land along the course of the river Namoi, and it is reasonable to suppose that the land put under cultivation was deemed to be well suited for that purpose. For the county of Nandewar the returns give 15·5 bushels of wheat



WEIR ACROSS LACHLAN RIVER AT FORBES.

per acre, 1·6 tons of hay, 20·5 bushels of maize, 20 bushels of barley, 20 bushels of oats, and 1·8 tons of potatoes. In the county of Baradine the yield was 18 bushels of wheat, 1·7 tons of hay, and 22·5 bushels of maize. These are the crops which a western farmer has to be satisfied with under exceptionally favourable conditions.

On the splendid agricultural land situated in the Riverina the average yields in the same year were :—Wheat, 18 bushels per acre ; wheaten hay, 1·7 tons per acre ; barley, 22·9 bushels per acre ; oats, 23·4 bushels ; and potatoes, 1·8 tons.

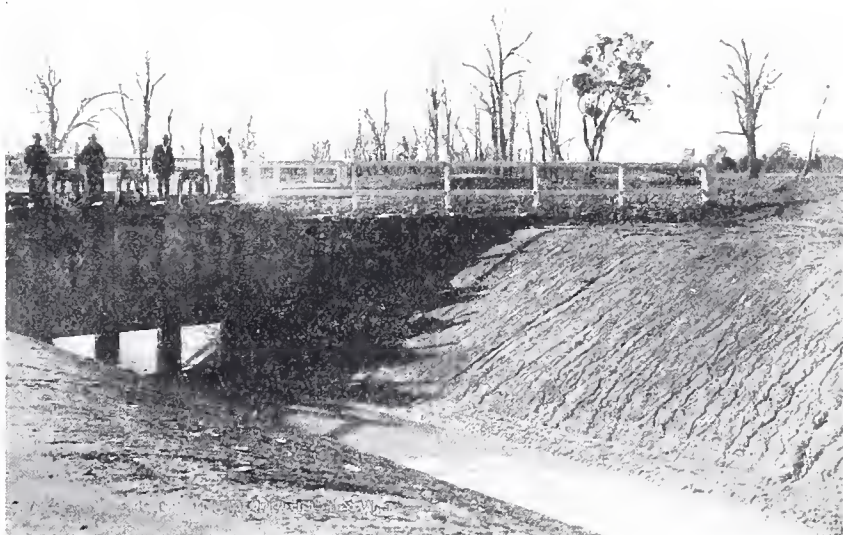
In the district bordering on the river Darling so little cultivation has been attempted that we have no safe basis of comparison ; but accepting the statement made by those who take an optimistic view of cul-

tivation without the aid of artificial watering we have the fact that crops can be obtained in two years out of three. Assuming this to mean that in the two years regarded as successful, crops of grain amounting to 12 bushels per acre, and that in the year of failure a crop of 3 bushels, are obtained, we have an average yield of 9 bushels per acre. To compare with this crop as an average, there is a case of Mr. Garden, of Cohuna, in the north-west of Victoria, who, in a very dry year when the yield on unirrigated land around was only about 2 bushels per acre, obtained a crop of from 20 to 40 bushels per acre by giving a watering which he estimated as equal to 5 inches.

**A Question
of
Price.**

It may be urged that it will not pay to irrigate grain crops in view of the low price which wheat sometimes touches. But, in the first place, there is no reason why irrigation should be confined to grain crops ; and, in the second place, the question as to whether it will pay depends on the character of the land, its position as regards communication and markets, and the price at which water can be supplied. As regards the variety of crops which can be artificially watered with advantage, the reply given by Major Powell, who is in charge of the Geological and Water Conservation Surveys in the United States, to a Committee of the Senate, is instructive. Major Powell stated that irrigation in the Western States is successfully practised with every variety of crops from those grown in Norway to those grown in Egypt. In connection with the various statements to the effect that irrigation of low-priced crops does not pay, some of these recall the remark of the potato-dealer who said that he was losing 3d. on every bushel he sold, and that the only thing that kept him from ruin was the fact that he was doing an extensive business. If a farmer working under natural conditions raises a crop of 12 bushels per acre, which is worth 2s. 6d. per bushel, I fail to see how he will lose if by the extra expenditure of 7s. 6d. or even 10s. per acre he increases his crop to 24 bushels per acre. This is really understating the case, for it is a matter of common knowledge that the ordinary producer's extremity is the irrigationist's opportunity.

In short, the question whether or not irrigation will pay depends on the very simple question "At what rate can the water be supplied ?"



EAGLE CREEK CUTTING AND REGULATOR, N.S.W.

**Cheap Water
necessary.**

It is obvious that for low-priced crops cheap water is a necessity. As an extreme case of this kind it will probably surprise some to know that the native grasses have been irrigated on a fairly extensive scale, and with most satisfactory results, in this State for many years past. There are not many cases in which this can be done, and, as a rule, in those in which it is practicable it would be more advantageous to put the land under cultivation. It often happens that the banks of a river, flowing through alluvial land, are higher than the land at some distance.

It is thus practicable, sometimes with a very moderate outlay, to divert a supply of water from a river through a cutting which gradually runs out to the ground level. Cases of this kind afford very cheap water. As a general rule it would not pay to pump water for the irrigation of the native grasses, but there are exceptions to this rule. Several instances might be quoted in which pumping machinery erected for the irrigation of various crops has been usefully turned



GUNNINGBAR CUTTING AND REGULATOR.

to account for the flooding of grass land; but there is little doubt that in every case the returns would have been better if the power available had been used exclusively for crops. It is not intended here to recommend the irrigation of pasturage, but the inference to be drawn from the fact that such irrigation is practicable is that the field for artificial watering of crops is much wider than is generally supposed.

It may be mentioned that in Upper India the rates charged for sufficient water for wheat, barley, and other winter crops vary from 2r. 4a. to 4 rupees per acre; while for maize, millet, and most other summer crops, excepting rice and sugar-cane, the rates vary from 1r. 10a. to 2r. 10a. per acre. The above rates are about equivalent to from 2s. 8d. to 4s. 8d. per acre for wheat and barley, and from 1s. 11d. to 3s. 1d. per acre in the case of maize and millet. In the Western States of America the average annual cost of water for irrigation is slightly over a dollar an acre. The American farmer has thus to pay a higher rate as a rule for water than has his Indian competitor.

Water could be supplied by pumping on a large scale from several of our western rivers at a cost of about 4s. per acre if the pumping and distribution were properly managed. Those who have access to river frontage in this State can, therefore, obtain water for irrigation at a cost not exceeding the average American rates. In the joint report prepared by Mr. F. W. Ward and myself regarding the river Darling, it was shown that irrigation in the neighbourhood

of Bourke would place that part of the river Darling in a position to compete with unirrigated land situated 200 miles nearer Sydney. I may state that this subject was dealt with in detail by Mr. Ward, who spared no pains in investigating it.

The Supply of Water. The question is frequently raised as to whether the supply of water in the State is sufficient for irrigation on an extensive scale. This is a subject which it would be out of place here to discuss at length, but it may be reassuring to state that though we are at a great disadvantage in possessing no mountains covered with perpetual snow, still our western rivers if properly utilised should irrigate at least half a million acres. When our irrigated area approaches that limit, we can greatly augment our available supply by the construction of storage reservoirs.

No Danger from Alkali. Much has been said and written on the subject of the spread of alkali by irrigation. So far as India is concerned some of these statements give a very incorrect impression. It is quite true that the level of springs has risen materially in districts which have long been under canal irrigation, and that in some cases extensive drainage works have been rendered necessary. This rise in the level of the underground water has doubtless a tendency to carry up the salts in the



MELONS GROWN ON AN IRRIGATED FARM.

subsoil ; but admitting all this, it is necessary to state that some writers have exaggerated the mischief done, and have quite overlooked the compensating benefits conferred. Some years ago the statement was made, on apparently good authority, that salty efflorescence was extending greatly in India, and that canal irrigation was the chief cause of this. The question was carefully inquired into by an engineer of the Punjab Irrigation Department, and among other matters brought to light was the fact that the lands most affected by the reh, as the efflorescence is locally termed, had not only never been irrigated, but were actually above the level at which the water could be supplied. This description applied specially to the district irrigated by the Western Jumna Canal—a district which was considered to be one of the most seriously affected by the reh. In his admirable work on “Irrigated India,” Mr. Alfred Deakin referred to reh not as a pest which is spreading, but as one for the eradication of which systematic action is being taken. During the course of my period of service in India I had considerable experience with this alkali question, and the advice, based on this experience, which I should give to anyone starting irrigation, is briefly this : “If your land contains more than an average proportion of salt, do not try irrigation”—“If your land is suitable for irrigation, be careful to keep your distributary channels on good land throughout their whole length.” It is necessary to add that land which is not fit for irrigation, so far as regards a high proportion of salt, is so uncommon in New South Wales that little need have been said now on the subject if it had not been that an exaggerated importance has been given to it by various writers.

It may reasonably be asked—if irrigation is a question of great importance to the agriculturists and the pastoralists of this State, why has it not been more widely adopted ? The main reason is that formerly existing laws tended to repress and not to encourage irrigation enterprise ; and until a law was passed under which definite water rights could be conferred, no material development of irrigation enterprise was to be hoped for. An Act dealing with this vital question was passed in 1896. To their credit, many landholders



undertook the risk of erecting pumping machinery for irrigation works, and many more constructed dams for the storage of water in the creeks and rivers. Previous to the passing of that Act the pastoralist, the farmer, and the fruit-grower constructed dams and erected pumping machinery on our creeks and rivers on sufferance only, and it is, therefore, not remarkable that small progress has been made with irrigation ; on the contrary, it is surprising that so much has been done. We often hear of the benefit to be derived from the proper use of manure, and results are quoted which show that it is quite practicable by judicious manuring to obtain more weight of crops off 40 acres than can be obtained from 80 acres of unmanured land. The waters of some at least of our western rivers contain an appreciable proportion of fertilising matter ; but, apart from this, watersupplied in sufficient quantity to crops at suitable times gives a large increase in the yield, so that the argument regarding the benefits of manuring apply also to irrigation.

PROJECTED GOVERNMENT ENTERPRISES.

MR. L. A. B. WADE,

PRINCIPAL ENGINEER FOR RIVERS AND WATER SUPPLY,

Contributes the following particulars of irrigation enterprises at present projected by the Government of New South Wales:—

The three main irrigation schemes which the Government of New South Wales have at present in view are the Northern Murrumbidgee Irrigation Scheme, the Southern Murrumbidgee Irrigation Scheme, and the Murray River Irrigation Scheme.

The first of these which it is proposed to take in hand is the Barren Jack Reservoir and Northern Murrumbidgee Irrigation Scheme, though whether under Government control or that of a private company is a matter not yet decided, but is at present being investigated by the Parliamentary Public Works Committee, on whose recommendation the Legislature will decide as to which method of carrying out the work will be sanctioned.

The Government scheme embraces the construction of—

(1.) A high masonry dam across the Murrumbidgee River at the “Barren Jack” site, about 22 miles south-west of the town of Yass, on the Main Southern Railway line. This dam, designed to hold a depth of 200 feet of water

immediately above it, forms the Barren Jack Reservoir, backing the water up the Murrumbidgee River for a distance of 40 miles, and having a capacity of 766,324 acre feet of water. This reservoir is intended to retain flood-waters, which will be released for use lower down the river during the dry summer months.

(2.) A movable Diversion Weir on the Murrumbidgee River, about 220 miles below the Barren Jack Dam, and 19 miles above the town of Narrandera, on the South-western Railway line, to turn the required amount of water from the river into the main canal.

(3.) A main canal, taking off from the river just above the Diversion Weir, having a course through the town of Narrandera, and thence following the western edge of the high ground in



YANCO CUTTING.

a generally north-western direction, together with a branch canal, commanding practically all the land lying to the westward as far as Hay and Gunbar.

(4.) A series of main and subsidiary distributing channels taking off at intervals from the main and branch canals to distribute the water to the various small holdings.

The amount of high-class irrigable land commanded by this canal is estimated at 357,000 acres. Nearly half this area is freehold held in big estates, on which it is proposed to impose an irrigation rate leaving the subdivision in the hands of the present owners if they so desire. The balance, consisting of Crown, Conditionally Purchased, and Conditionally Leased lands, it is proposed to acquire and subdivide into small irrigation holdings up to 100 acres in area,

**Suggested
Method
of Working.**



IRRIGATION CHANNEL AT NORTH YANCO.

and to sell to settlers on easy terms. This land will also be liable to an irrigation rate. The rate proposed will be equal to a charge for water of 5s. per acre foot, which gives the very moderate annual rate of 10s. to 12s. 6d. per acre for a full supply of 24 to 30 acre inches. On both parts of this scheme a considerably larger area of land is commanded than that given as "irrigable," and consequently fair sized holdings of "dry" land to be worked in conjunction with the irrigated areas for stock-raising purposes should be available. The soil in this locality, especially that nearest the hills, is of a splendid quality for irrigation culture, capable of growing to perfection all fruits suitable to the climate, lucerne, and other fodder crops of all descriptions, and this is confirmed from actual results in the locality and the official reports

of the experts of the New South Wales Department of Agriculture. A system of mixed farming with a good water supply should, therefore, command certain success, while the quality of the soil, a deep rich sandy loam, the terms on which the Government could afford to sell it, and the security of the water supply will render this scheme an ideal one for small settlers. In addition to these high-class lands suitable for intense culture and closer settlement, an area of about 1,000,000 acres of pastoral lands will be commanded. This area will be supplied with water for stock purposes and the irrigation of a small proportion of fodder crops.



NORTH YANCO HOMESTEAD AND ARTIFICIAL LAKE.

Southern Murrumbidgee Scheme. The construction of the Barren Jack Reservoir will provide sufficient water for another scheme of irrigation on the southern side of the Murrumbidgee River, directly opposite to that on the northern side, to be known as the Southern Murrumbidgee Irrigation Scheme, but this will not be put in hand till the Northern Scheme is well under way. The irrigable land under this scheme of an approximate area of 500,000 acres will, as far as at present determined, be left in the hands of the present owners for subdivision, the Government supplying and charging for the water at a similar rate to that proposed for the Northern Scheme.

Murray River Proposal. The Murray River Irrigation Scheme is proposed to water the country between the towns of Corowa and Deniliquin in the Riverina district of New South Wales. This scheme, like those on the Murrumbidgee River, is dependent on the storage of flood-waters in a reservoir on the upper part of the river, such waters to be released for use during the summer months, when the river is

ordinarily low. A diversion weir at Bungowannah, a few miles below Albury, will turn the water into the main canal, down which it will flow for some 39 miles before the land to be irrigated is commanded. Altogether some 900,000 acres of irrigable land and 500,000 acres of pastoral land are commanded by the main canal (which will have a total length of 99 miles) and laterals, the water available being sufficient to irrigate 1 acre out of every 9 of the irrigable land at the approximate cost of 5s. per acre foot to the users. The irrigable land is a rich, red, loamy soil, of a splendid quality for irrigation culture, and its subdivision for closer settlement is proceeding rapidly at the present time, and will be much accelerated when a supply of water for irrigation is available.



THE FIRST ARTESIAN BORE IN THE WEST.

SOME PRACTICAL IRRIGATING HINTS.

By W. J. ALLEN,
GOVERNMENT FRUIT EXPERT.

If there were a few loeks on the Darling, Murrumbidgee, Macquarie, and Edwards Rivers, and the landowners were to take up the irrigation question in earnest, it would be quite possible for Australia to carry double the stock and grow five times the quantity of wheat without any risk whatever. Such a state of things cannot be brought about all at once, as the people have to be educated up to the manner of using the water before they will understand its many advantages. Wherever irrigation has been carried out on good loamy soil which has a fair natural drainage, good



INDI RIVER, N.S.W.

results have been obtained, and it is on such land, whether it be alluvial such as is found in many of our river flats, or the light to medium loamy soil, with or without limestone nodules in the subsoil, that we shall find some of our best land for growing crops under irrigation. In the schemes described by Mr. Wade as being projected by the Government, it is proposed that water should be delivered by gravitation on to some of the best land we have for irrigation purposes. There are several different classes of land, some of which is suitable for growing the very best fruits for either drying or the fresh fruit trade; while some is first-class lucerne land, which will produce six cuts of hay per annum. Other portions are suitable for the cultivation of sorghum, wheat, vegetables, cotton, or tobacco. Dairying and raising lambs for export and pigs for bacon would also be profitable industries to take up within these areas. In our warm and genial climates, with a sufficient supply of water intelligently applied to our best lands, there should be no such thing as failure.

Application to Crops.

Apart from the problem of land suitable for irrigation, and a supply of good pure water, free from any injurious chemicals, there is the question of applying the water to the different crops. Two methods are usually followed—flooding and furrows. Sub-irrigation is practised on a limited scale in a few places, but is rather an expensive undertaking. The furrow system is that most generally used wherever it is practicable, as it is economical, there is a minimum loss through evaporation,

and the water can be so handled that the land receives an even soaking. There is very little, if any, waste water, and the furrows can be cultivated as soon as they are dry enough. Land well cultivated after being irrigated retains the moisture, the loose soil on the top acting as a mulch, and preventing evaporation. It will, therefore, be seen that crops so watered and worked will require less frequent waterings than where cultivation is not carried out. In irrigating through furrows care should be taken to see that just sufficient water is turned into a furrow to keep it wet from top to bottom, as by so doing the land receives a thorough soaking without damage by scouring as is the case where an unnecessarily large quantity of water is allowed to run.

**Land should
be properly
levelled.**

In America it is not an unusual sight to see fluming in place of earthen channels, and the water is turned into the furrows by opening a small slide made of thin galvanised-iron, which can be so regulated as to permit just the desired quantity of water to run into any one furrow, and one man can attend to several hundred furrows with but little trouble if the land is properly levelled, and the head channel or flumes are properly constructed. All land required for irrigation should, therefore, be properly levelled, and suitable head channels made, before any attempt is made to run water, and much trouble and labour in after years can be avoided by attending to this work. In ordinary earth channels it is well to have drops at convenient distances so that by closing one or putting in an extra slide it will raise the water sufficiently high to divert it into the different furrows. Holes may be cut in the side of the head drain to

allow the water to run into the furrows, and straw, weeds, or hessian may be used for equalizing the flow of water. Of course, this is a makeshift, and sluice-boxes will be found much better. These should be let into the banks of the channel, and through these the water is run into the furrows, and the quantity of water regulated by a slide. As there are generally a few weeds or a little moss in the water, it is necessary to inspect the



WHARF AT ECHUCA, MURRAY RIVER.

slides from time to time in order to keep them free from any such rubbish and ensure a regular flow. A constant watch should be kept on all furrows to see that the water does not break and spread over the land to its detriment.

Another important point, which in this country is very often neglected, is a waste-water drain, so situated that it will catch any surplus water and deliver it on to some other section of the farm where it can be used. It also acts as a surface drain, so that as soon as the soil is thoroughly soaked all surplus water may be turned into the drain, and not allowed to stand on the soil or crops, as is so often the case. Such stagnant water is very frequently the cause of trees, crops, or vines dying off in a most mysterious manner. In fact, I consider that many



LAKE TAILA.

of the reported failures at the different artesian bores are traceable to this—the use of too much water, and lack of cultivation—rather than to any other of the many causes brought forward at times by those who claim that artesian water is not suitable for irrigation.

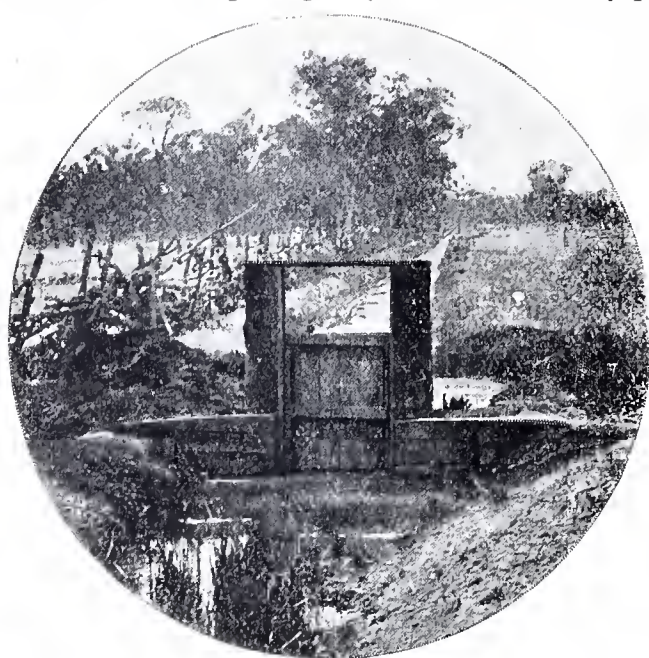
Lucerne is usually flooded by running a large head of water into the block along the highest side, until it is thoroughly soaked, when any standing water is drawn off to avoid damage to the plants. Blocks may be of any size from one-half to 10 acres. Around each block there is a bank thrown up to a sufficient height to keep the water within the block. The sides of the bank should have a gradual fall so that machines, waggons, and carts may be driven over easily during the harvesting operations. Before sowing lucerne seed the land should be watered if it is dry, then ploughed to a good depth, and if it has been well worked up and levelled before the last irrigation, it should be harrowed, and rolled with a light roller, and then the seed sown in drills 9 inches apart, using from 10 lb. to 12 lb. of seed to the acre. If the work is properly done the seed will come up well, and will not require a further watering until it is several inches high. A good time for sowing is the early autumn, some time early in March, or, if sown in the spring, September or October are good months. After the seed is well up, a light harrowing would be found beneficial to the plants. As soon as the lucerne is from 10 to 12 inches high it is well to cut it and allow the hay to remain on the ground. This will tend to make it stool out and thicken up so as to cover the ground. The lucerne should be given a thorough watering just before cutting, so that it will make a strong growth after cutting. The best results are obtained if the crop receives a thorough soaking every month through the six hottest months.

**Trees
and
Vines.**

For planting trees and vines the land should be levelled preparatory to planting. If it is damp, the trees may be planted without running the water down a furrow between the double stakes, but should the planting be done when the ground is dry, it is best to soak the ground before planting. Again, as soon as the trees are planted, the sooner the water reaches the newly-planted tree the better are the chances of making a strong start. The same remarks apply to the planting of vines. As soon as the ground is dry all young trees and vines should be well worked around with a fork hoe, and the soil between the rows worked to a fine tilth. Should the weather continue hot and dry a second irrigation should be given to citrus trees within three weeks from the date of planting. Deciduous trees or vines would not require water so quickly, but if the young plants do not start readily, watering must not be neglected, as there is nothing like plenty of water for newly-planted trees. After they are well established

less water may be used, but plenty of cultivation should be given, this being of as much importance as the water. After the first year or two deciduous trees should not require more than two or three irrigations during the summer, but they require plenty of cultivation from the early spring throughout the summer.

Citrus orchards usually require more irrigations than deciduous, but the trees should not be kept growing too late into the fall, else the growth will be tender, and should frosts start early the tree and fruit are liable to be badly frozen. It will also be found that citrus fruit taken from trees irrigated late will not keep as well as fruit taken from trees which have not been



SLUICE GATES.

over irrigated or watered late. If vines are well watered in the winter they will not require so many summer waterings, but the ground must be cultivated deep and often. Avoid watering when the grapes are flowering and setting.

Potatoes. For potatoes, work the land up well, and if it be dry, irrigate just before ploughing. Plough deeply as soon as the land is dry, and plant immediately.

Keep the ground well harrowed until the young plants are well up. One good irrigation, or at the most two, are all that is required for a crop, and these should be given before the young potatoes are any size, as late watering will induce a second growth, which spoils the tubers. The secret in potato-growing is good cultivation combined with no more water than is necessary to keep the plants in good growing condition. The spring crop should be planted as soon as the severe frosts are over, which is usually towards the end of August, and



SCENE AT GOSTWYCK, ARMIDALE, NORTHERN DISTRICT.

the autumn crop in February. They should be planted in drills 3 feet apart, and when it is found necessary to irrigate, furrows may be drawn midway between the rows and water allowed to run until the ground is well soaked. As before stated, two waterings with good cultivation should be sufficient for any crop of potatoes. The autumn crop will naturally require one or two more waterings than the spring crop, as the ground is naturally drier at that time of the year, and the heat more intense.

Peas. Peas may be sown in drills in moist soil. If sown during hot weather they will require more frequent irrigations and cultivation than during the cooler months. They should be irrigated by drawing a furrow between each row of peas and running the water down. Drills should be about the same distance apart as for potatoes.

Corn. The drills for corn should be 4 feet apart. If the ground is dry, furrows should be drawn and water run along previous to planting, when the seed may be dropped into these drills, and a light furrow turned on the seed; the ground should receive a thorough cultivation. Future waterings should be made through furrows drawn between the rows. This crop is usually raised for green feed for milking cows or for ensilage. Under irrigation very heavy crops can be produced.

Unless the ground is moist it is best to saturate it thoroughly with water for grain, and as soon as it is dry enough it should receive a good deep ploughing and harrowing, and the seed should be drilled in from day to day. The grain will soon make its appearance above ground. By working the ground in this way it holds the moisture much better than it would if the land were ploughed while dry, and the seed sown and irrigated to cause germination, as this latter process tends to set the soil. It will then require a second irrigation long before that which had received the watering before ploughing. At the time of harvesting it will be found that the heaviest yield will come from that portion which had been watered before being sown. When seed is sown in moist soil it usually requires no irrigation for two or three months, during which time the grain will make a good growth and send its roots down deeper than in soil which had received an irrigation directly it was sown. By the time the moisture stored in the ground before sowing has evaporated the grain will have made a good growth, therefore when water is applied evaporation from the soil is not so great as it would be from crops irrigated at an earlier stage. Hence the soil of such fields remains in much better condition than that in those irrigated directly after seeding, and the grain has an opportunity of making a correspondingly better growth, and in consequence gives a greater yield. Immediately after sowing, furrows should be drawn at distances of from 3 to 4 feet apart, for future waterings.

Sorghum. Sorghum is sown on deeply worked moist soil, and furrows made at distances of from 3 to 4 feet apart, through which to run the water for future irrigations. Good crops of this fodder plant can be grown on fairly heavy soil. Many other crops, such as pumpkins, cabbages, cauliflowers, squashes, onions, water-melons, tomatoes, strawberries, and all other garden vegetables, can be grown with very little trouble. Where trees, vines, or other fruits and vegetables are grown under irrigation care must be taken to see that the water does not flow over the surface of the soil about the trees or plants, and that after each irrigation the cultivator is brought into requisition, and also the fork hoe for loosening the soil close to either trees or plants.



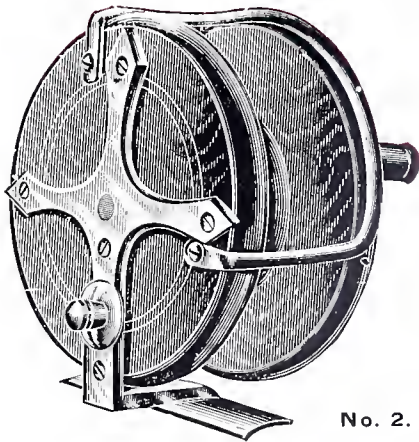
MOUNT KOSCIUSKO, AS SEEN FROM TOWONG STATION.



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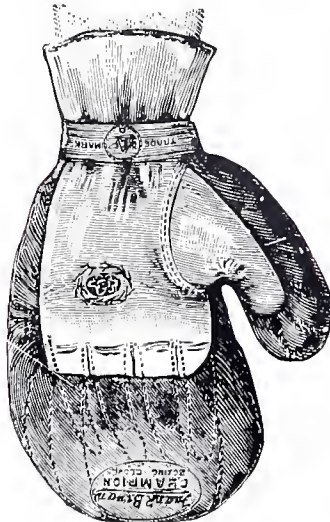
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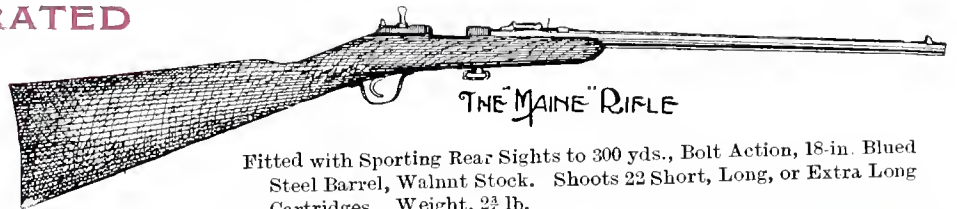
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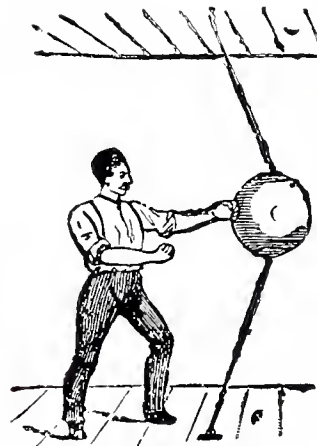
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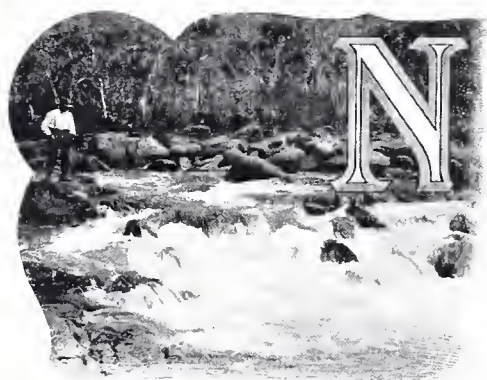
REMITTANCE AND FREIGHT MUST ACCOMPANY ORDER.

The Fisheries of New South Wales.

Their extent and value—An undeveloped mine of wealth.

By FRANK FARNELL,

CHAIRMAN, BOARD OF FISHERIES FOR NEW SOUTH WALES.



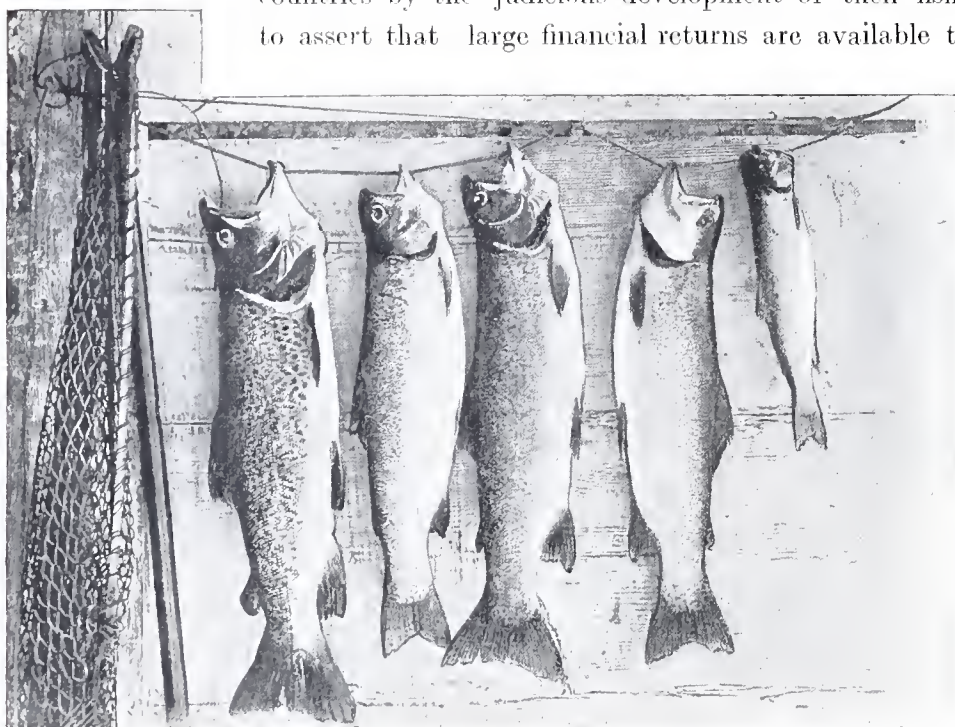
NEW South Wales possesses a shore line of over 700 miles, off which are splendid, but undeveloped, fisheries. Her numberless inlets, superb harbours, and extensive rivers teem with fish life. Some of the edible marine fishes are of great value and enormous size. Huge black rock cod, the lordly and much esteemed schnapper, jewfish, whiting, black bream, trevally, mullet, blackfish, teraglin, garfish, herring, the pilehard, the anchovy, and other varieties may be captured on the coast and in the estuaries. Delicious oysters abound in many of

the rivers and far-extending shallow bays, and, in addition, crayfish, prawns, &c., are plentiful in their season. The great inland rivers—the Murray, the Darling, and the Murrumbidgee—are rich in piscine life, and the far-famed Murray cod, which not infrequently attains a weight of from 40 lb. to 80 lb. (specimens exceeding 100 lb. in weight have been taken), can be caught in quantity.

Despite the fact that there is an abundance of the various species within easy reach, the fish supply of the State is totally insufficient to meet the demands of the population, and exceedingly dear. Fish is a positive rarity in the suburbs of Sydney, and in all the inland towns. The people would willingly purchase supplies of fresh fish, were such available; but the fact remains that owing to the total want of a systematic and effective scheme of distribution they are unable to obtain an article of food for which they would readily pay fair prices, always provided it were conveyed to them cleaned and ready for cooking, and in a perfectly wholesome condition. Many thousands of people in the State who rarely or never see fresh fish would gladly avail themselves of the opportunity to purchase supplies of this nutritious food if only there were devised some means for placing it within their reach at reasonable rates.

Undeveloped Industries. It seems incredible that with a population of over 1,500,000 souls, and the great possibilities staring us in the face, an association has not been formed long ago to develop the enormously prolific fisheries of New South

Wales by the establishment, on large and substantial bases, of the important industries of fish-capture, oyster-culture, fish-distribution, fish-curing in all its branches, whaling, and, indeed, the pursuit of every industry which has its origin in the products of the sea, including the manufacture of fertilisers from fish refuse and the non-edible section, and the extraction and refinement of fish oils. Most of these industries have hitherto been culpably neglected, some having been in the main conducted by incapable and inexperienced persons, while others of them have not been touched at all. Viewed from results achieved in other countries by the judicious development of their fisheries, it seems safe to assert that large financial returns are available to any who will take



A CATCH OF TROUT IN THE SNOWY RIVER.

up these industries in New South Wales on bases which will carry plentiful, cheap, and regular supplies to the people of the State. A special feature should be made of oyster-farming. The oyster, as an article of food, is esteemed both as a delicacy and for its

nutritive qualities all the world over. Some of the finest oysters known to commerce are produced in profusion in the bays and inlets along the New South Wales coast, and all that is required is capable management and systematic cultivation to establish a sure source of profitable income.

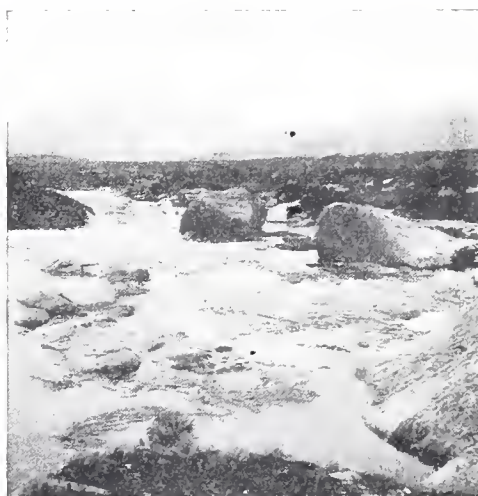
Fish Imports to New South Wales. Salting, drying, tinning, and smoking the excellent edible fishes which abound in New South Wales waters should form special departments in any association's operations, and should prove profitable in the extreme. When it is considered that for the five years ending December, 1904, frozen and preserved fish to the value of £782,000 were imported into New South Wales, the neglect to utilise the raw material of a better class waiting unheeded at the very doors

of the colonists is simply amazing. It is open for private enterprise, not only to take up the opportunity, but to add to its value by initiating a scheme for the export of prepared fish to all parts of the world. Another feature in the operations of any company, and one new to the State, should be the supply of fish gutted and scaled ready for cooking, not only in the metropolitan and suburban areas, but in the cities and populous towns of the interior. Given an effective system of distribution, there seems no reason whatever to doubt that the opportunity of obtaining at cheap rates regular supplies of such tasteful and nutritious articles as fish food and oysters would be largely availed of.

For a considerable time past immense sums of money have been subscribed in England for colonial gold-mines. To my mind, the marine and inland fisheries of New South Wales offer to capitalists far more tempting and certain and wider fields for investment than many of the gold-mines; all that is necessary is to develop the fisheries, place the fishing industries upon substantial bases, and thoroughly exploit the large and ever-expanding market which awaits those skilful enough to cater for the same. Any company formed should be to some extent co-operative, embodying the principle of payment by results, thus ensuring the utmost diligence and interest on the part of employees in the prosecution of their work, and rendering the association independent of the fluctuations of the local labour market. The payment of a small bonus annually to those employed by the company would stimulate to far greater activity than would obtain under ordinary conditions, and greatly assist in the success of the undertaking.

Port Stephens, Lake Macquarie, Lake Illawarra, Tuggerah Lakes, Hawkesbury River, Jervis Bay, Port Macquarie, and the Clarence River are, amongst others, pre-eminently adapted for fish-curing establishments on an extensive scale, and there is no questioning the fact that fish of the finest species and in almost inexhaustible quantities are at all seasons of the year obtainable in the vicinity of these places.

There is an abundance of the very choicest fish within the waters of New South Wales. The people of Sydney and the inland towns would readily purchase fish at reasonable rates, but are prevented from so doing by the total lack of a proper system of fish distribution. The annual value of the fish at present sold through the market in Sydney amounts, roughly speaking, to something under £100,000. That amount could have been easily exceeded had there been a proper mode of dealing with the fish after capture, but owing to the lack of cool chambers,



THE CASCADES, SNOWY RIVER.



SEA MULLET.

well-boats, curing and smoking establishments, tons and tons of valuable fish food are wasted every year, and the fishermen and the public have suffered as a consequence. There is an undoubted market; the supply of fish is proved to be immense and practically inexhaustible; all that is needed is for private enterprise to work the matter up on right lines, and success is more than certain.

It is undeniable that in the seas which surround our continent there is a store of wealth in the shape of natural food supply, the neglect of which by a hardy and enterprising population seems almost inexplicable, and is only to be accounted for by the ease with which the people have been able to earn a subsistence without resorting to this vast source of supply.

The potentiality of natural
Trawling wealth in the depth of our
proved to be waters may possibly be found
possible. to be astounding, but as yet
those waters are unexplored.

Our deep-sea fishing-grounds should be one of the chief sources of supply, and the lakes, lagoons, &c., should be looked upon and cared for as natural nurseries for stocking the ocean. A trawling expedition was undertaken in the Government steamer "Thetis," under my direction, in 1898, in order to test the grounds off the coast. The result of the operations carried out proved beyond doubt that trawling could be carried on in connection with our offing fisheries, and with success. The experiments of the cruise proved that there were no serious obstructions except that of a wreck (the "Minora"), the net having become fast only once, and then on the obstruction mentioned. I trawled for hours at a time with the current, against the current, and across the current, with the best of results. Again I trawled at

night time and during the day with no varying results. Fish were caught during night and day, of the best varieties, of the best quality, and in quantities that I have no hesitation in saying would form a payable basis on which to start commercial operations. Lastly, investigations were made with a view of testing the presence of food for fish, and as a result of these investigations the sea was discovered to be teeming with animal life for the fish to feed upon.

Over ninety different species were captured on the trawling expedition, including John Dory, schnapper, sole, flounder, skate, and flathead, and I am just as persistent in my belief as ever in predicting that a thorough trawl survey would disclose an immense field for operations in respect to fisheries which are available for development. The abundant harvest awaiting enterprise off our coast only requires human agency to ensure a most important contribution to our food supply.

In other parts
Valuable of the world, with
By-products. nothing like the
facilities offered
here, the people make the best use
of all the sea's products, even to the
preparation of their fish as food for
cattle, sheep, and horses. Our con-
ditions may not necessitate going
to that extent, but I mention the
fact to show what may be done.

T



BREAM

We are fortunate in being able to record over 500 different species of fish in our waters, most of which are edible, and although it might be thought by some that the non-edible section is valueless, I desire to emphasise their value in manufacturing fertilisers, for extracting the oil, and making fodder for cattle. Opposite is a list of our principal food fishes, which goes to show that nature has bestowed upon us quantity, quality, and variety, not excelled in any other part of the world, and with resources like these I have every confidence in offering every inducement to those so inclined to engage in developing the industry, feeling sure that a profitable and lucrative field awaits those who will exploit and work the store of national wealth contained in the ocean off our coast.

Our waters teem with fish life in value beyond computation. Here is an annual harvest that comes as a sheer gift to our doorsteps for which the hand of man has not delved, and over ground for which no rent is asked.

Waters Teeming with Fish Life. All that we have to do is to gather in this magnificent harvest, and so give the people at a fair price an article of food they greatly need, and set up a prosperous industry that would supply us with sailors, as well as with fish and fishermen. We have persistently missed our opportunities, and harvest after harvest has been allowed to pass us absolutely untouched. What this dereliction of duty means in industrial loss to us is shown by the fact that in the old country, which carefully harvests this great source of wealth, the fishing industry gives employment to over 200,000 people and a fleet of 25,000 vessels. The monetary loss we incur by our apathy is disclosed by the fact that while New South Wales takes only about £100,000 worth of fish out of its waters, the fishermen of the old land gather from the sea an annual harvest that averages in value millions of pounds, besides forming the sturdy backbone of the Navy Reserve force, on which the Imperial Government sets great store.

But the people are not exclusively to blame for this deplorable state of things. The Government of the old country has expended, most wisely and profitably, large sums of money in the development of its fishing industry, and so helped it to grow until it was strong enough to stand and work unaided. The first effort made by the Imperial Government to help the British fisheries as a source of national wealth was to survey the waters all along the coast line and to locate the best fishing-grounds. The next step taken was to assist the fishermen with loans on easy terms for the purchase of boats and gear, and the last, and by no means least useful, work



WOY WOY, A FAMOUS FISHING-GROUND.

done for the fisherman was to send agents all over Europe to find fresh markets for his fish. This was the kind of work that raised the fishing industry of the old country from a small concern into the superb source of national wealth and of food supply it is to-day. Being thus a concern of national profit, it was properly the work of the Government to do, and it was well done.



If one-twentieth part of the money spent in subsidising mineral prospecting had been devoted to the development of our magnificent fisheries, we should have to-day a great and prospering national industry. Our Government made an experiment in trawling, which was successful in showing clearly how profitable would be a complete survey of our coast, and a careful observation of the seasons of our visiting shoals, and the location of their breeding grounds. It will be greatly to the public profit if the Government or private enterprise can be induced to do the needful work of exploring and surveying our waters, without which our fishing industry must ever remain practically undeveloped.

LIST OF THE PRINCIPAL EDIBLE FISHES OF NEW SOUTH WALES.

Species.	Common Name.
1. <i>Megalops cyprinoides</i>	Ox-eye (ox-eyed herring).
2. <i>Elops saurus</i>	Grant herring.
3. <i>Chanos chanos</i>	Salmon herring.
4. <i>Dorosoma erebi</i>	Bony bream (Pibrie).
5. <i>Clupanodon neopilchardus</i>	Pilchard.
6. <i>Sardinella castelnaui</i>	Herring.
7. <i>Potamalosa novæ hollandiæ</i> *	Freshwater herring.
8. <i>Hyperlophus spratellides</i>	Sandy sprat.
9. <i>Engraulis antipodum</i>	Anchovy.
10. <i>Copidoglanis tandanus</i>	Freshwater catfish.
11. <i>Cnidoglanis megastomus</i>	Estuary catfish.
12. <i>Anquilla bengalensis</i>	Long-finned eel.
13. <i>Muraenesox cinereus</i>	Silver eel.
14. <i>Prototroctes maræna</i>	Australian grayling.
15. <i>Aulopus purpurissatus</i>	Sergeant Baker.
16. <i>Tylosurus ferox</i>	Slender long-tom.
17. <i>Tylosurus macleayana</i>	Stout long-tom.
18. <i>Hyporhamphus intermedius</i>	Sea garfish.
19. <i>Hyporhamphus regularis</i>	River garfish.
20. <i>Arrhamphus sclerolepis</i>	Short-beaked garfish.
21. <i>Mugil dobula</i>	Sea mullet (hardgut mullet).
22. <i>Mugil peronii</i>	Flat-tail mullet (fan-tail mullet).
23. <i>Mugil petardi</i>	Richmond mullet.
24. <i>Myxus elongatus</i>	Tallegalane (sand mullet).
25. <i>Agonostomus forsteri</i>	Yellow-eye mullet.
26. <i>Sphyræna novæ-hollandiæ</i>	Short-finned pike.
27. <i>Lotella callarias</i>	Ling (Beardie).
28. <i>Beryx affinis</i>	Nannygai.
29. <i>Girella tricuspidata</i>	Blackfish.
30. <i>Girella cyanea</i>	Bluefish.
31. <i>Percalates colonorum</i>	Estuary perch.
32. <i>Plectroplites ambiguus</i> *	Golden perch.
33. <i>Macquaria australasica</i> *	Macquarie's perch.

Species	Common Name.
34. <i>Oligorus Macquariensis</i> *	Murray cod.
35. <i>Epinephelus dæmelii</i>	Black rock-cod.
36. <i>Promicrops itaiara</i>	Queensland groper.
37. <i>Glaucosoma scapulare</i>	Pearl perch (Epaulette-fish).
38. <i>Enoplosus armatus</i>	Old-wife.
39. <i>Dinoleates Lcwini</i>	Long-finned pike.
40. <i>Arripis trutta</i>	Australian salmon (salmon trout).
41. <i>Sillago ciliata</i>	Sand whiting.
42. <i>Sillago maculata</i>	Trumpeter whiting.
43. <i>Sillago punctata</i>	Spotted whiting.
44. <i>Sciæna antarctica</i>	Jewfish.
45. <i>Cynoscion atelodus</i>	Teraglin.
46. <i>Latris ciliaris</i>	Bastard trumpeter.
47. <i>Haplodactylus lophodon</i>	Cockatoo fish.
48. <i>Dactylosparus carponemus</i>	Morwong.
49. <i>Dactylosparus macropterus</i>	Jackass-fish.
50. <i>Cheilodactylus fuscus</i> .	
51. <i>Terapon ellipticus</i> *	Silver perch (grunter).
52. <i>Histriopterus labrosus</i>	Giant boar-fish.
53. <i>Pagrosomus auratus</i> .	Schnapper (red bream, squire, &c.).
54. <i>Chrysophrys australis</i>	Bream (black bream).
55. <i>Chrysophrys sarba</i>	'Tarwhine.
56. <i>Upeneus porosus</i>	Blue-striped red mullet.
57. <i>Scorpiæ æquipinnis</i>	Sweep.
58. <i>Ephippus multifasciatus</i>	Butter-fish.
59. <i>Diastodon unimaculatus</i>	Spotted pig-fish.
60. <i>Diastodon bellis</i>	Striped pig-fish.
61. <i>Choerops ommopterus</i>	Blue-spotted groper.
62. <i>Achærodes gouldii</i>	Blue groper.
63. <i>Ophthalmolepis lineolatus</i>	Maori (rainbow-fish.)
64. <i>Odax richardsonii</i>	Rock whiting.
65. <i>Olisthops cyanomelas</i>	Herring kale.
66. <i>Seriola lalandi</i>	Kingfish.
67. <i>Trachurus declivis</i>	Yellowtail.
68. <i>Caranx georgianus</i>	Trevally.
69. <i>Pomatomus saltatrix</i>	Tailer.
70. <i>Scomber colias</i>	Mackerel.
71. <i>Sarda chilensis</i>	Horse mackerel.
72. <i>Scomberomorus commersonii</i>	Banded Spanish mackerel.
73. <i>Scomberomorus guttatus</i>	Spotted Spanish mackerel.
74. <i>Thyrsites alun</i>	Barracouta.
75. <i>Paralichthys arsius</i>	Large-toothed flounder.
76. <i>Paralichthys novæ-cambiæ</i>	Small-toothed flounder.
77. <i>Ammotretis rostratus</i>	Long-snouted flounder.
78. <i>Synaptura nigra</i>	Black sole.
79. <i>Sebastapistes percoides</i>	Red gurnet perch.
80. <i>Scorpena cruenta</i>	Red rock-cod.
81. <i>Notesthes robusta</i>	Bull-rout.
82. <i>Platycephalus fuscus</i>	Common flathead.
83. <i>Chelidonichthys kumu</i>	Red gurnard (kumu gurnard).
84. <i>Pterygotrigla polyommata</i>	Sharp-beaked gurnard.
85. <i>Gadopsis marmoratus</i> *	River blackfish (slippery).
86. <i>Pseudomonacanthus hippocrepis</i>	Variable leatherjacket.
87. <i>Pseudomonacanthus ayrandi</i>	Common leatherjacket ("Chinaman").

NOTE.—Those marked with an asterisk are purely fresh-water fishes. A number of the others are found at times in water which is wholly or partially fresh; but, properly speaking, they are either marine or fluviomarine.

There are about 525 "good" species of New South Wales fishes (*Elasmobranchs* and *Teleostean*s), and of this number about half may be regarded as "edible fishes" properly so-called. Many others could be used as food if necessity arose. It is impossible to make any hard and fast line of demarcation between fishes-edible and fishes-inedible excepting in a very few instances.



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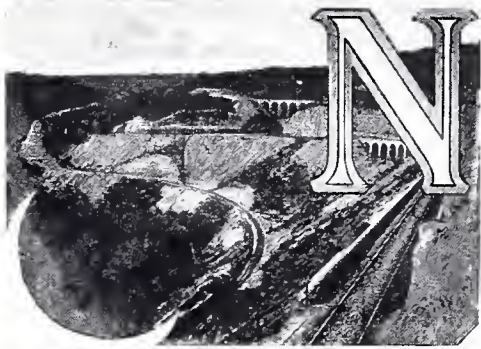
EST. 1884.



The Mineral Industry.

By E. F. PITTMAN, A.R.S.M.,

GOVERNMENT GEOLOGIST AND UNDER SECRETARY FOR MINES.



NEW SOUTH WALES has been endowed by Nature with mineral wealth which is vast, not only in extent, but in variety; for almost all the valuable metals and minerals occur here in considerable quantities. The first economic mineral to be discovered was coal, which was found both at Coal Cliff in the South, and Newcastle in the north, in the year 1797. The discovery of coal was not sufficient in itself to attract population at that time to the country, inasmuch as the substance is only of much value where a settled population exists, and where industries necessitating its use have been established. The enormous supplies of coal, however, which are now known to occur, and which extend continuously from near Singleton on the north to beyond Wollongong on the south, and from the coastline on the east to Lithgow on the west, constitute one of our most valuable national assets, and must contribute largely to the future prosperity of the State; indeed, for many years past the coal-mining industry has been one of the most important in New South Wales.

At a moderate estimate, there are about 115,346,000,000 tons of coal available for mining in this State.

The event which caused the first great influx of population to Australia was the discovery of gold, and it was at a place called Ophir, in the Orange district, that the precious metal was first proved to occur in payable quantities. This discovery was made in May, 1851, and its publication had an immediate and wonderful effect on the destinies of Australia. A tide of immigration set in from all parts of the world, and prospecting operations spread over the whole island continent with amazing rapidity. The largest and richest goldfields were subsequently found in Victoria, which was originally a province of New South Wales, but was established as a distinct colony on the 1st July, 1851. The discoveries in the mother State, however, were also of great importance. The development of Australia was directly due to the finding of payable gold, for of the many thousands of persons who were attracted to the

country by the prospect of a speedy fortune to be made in gold, a large proportion remained, and engaged in other occupations after the first rush in the goldfields had abated. It was in this way that a permanent population was settled in Australia, and such cities as Sydney, Melbourne, Adelaide, and Brisbane were established.

Gold-mining in this country is still not only an important industry, but a growing one. It is true that the more easily won alluvial deposits, which attracted the attention of the earlier prospectors, have long since been exhausted; nevertheless a more settled industry has resulted from the working of the quartz reefs and other matrices from which the alluvial gold was originally shed, and new deposits of this nature, of greater or less richness, are continually being opened up. The total value of the gold won from the soil in New South Wales, from the discovery of the goldfields in 1851 to the end of 1905, is estimated at £53,235,286.

Silver was known to occur in New South Wales as far back as the year 1839, but the first attempt to work it commercially was made at Moruya in 1864; the attempt, however, was a failure, owing to the complex nature of the ore. Several more or less important silver fields were discovered subsequently; but it was not until 1883 that the marvellous Broken Hill lode, which completely overshadowed all other mines in this country, or perhaps in the world, was opened.

The history of the Broken Hill lode serves to show how easily fortunes can sometimes be made in mines by persons who possess no knowledge of mining. The mine was “pegged out,” and a mineral lease applied for by a local resident named Charles Rasp, who was totally without knowledge or experience of mineral deposits, and who was induced to take it up because he imagined the outcrop to consist of tin ore. Mr. Rasp was a boundary rider on the Mount Gipps pastoral holding, and when he returned to the station at night he informed Mr. McCulloch, the manager, and the other employees what he had done, when it was decided that a syndicate should be formed by seven of them, each person contributing the sum of £70. There were fourteen shares in the syndicate, and within six years from the opening of the silver mine the market value of each of these shares, with dividends and bonuses added, was about £1,250,000. Up to the end of December, 1905, the property originally acquired by Rasp and his partners has paid over £11,900,000 sterling in dividends, and the prospects of the mines were never better than they are at the present time.

The presence of tin in New South Wales was first detected in the year 1851; it was not until 1872, however, that the alluvial tin deposits of New England were worked, first in the neighbourhood of Inverell, and later at Emmaville or was then called. At the superficial or more were the first to be quently the deep tertiary



SOUTH HEAD, SYDNEY HARBOUR.

Vegetable Creek as it both these localities easily won deposits worked, but subse- leads, or old river

beds, were exploited to some extent. There still remain, however, many of these deep and wet deposits which are practically unprospected, and as they are for the most part covered by a considerable thickness of hard basalt, it is obvious that mining operations in them can only be successfully carried on by companies or individuals possessing a considerable amount of capital. Many tin-bearing lodes are known to exist in different parts of the State, but it is rather a remarkable fact that very little has been done in the way of developing them. There



BROKEN HILL SILVER MINE.

can be very little doubt that, in the future, lode-tin mining will become one of the State's important industries. The total value of the tin won in New South Wales from the year 1872 to 1905 was £7,436,461.

The ores of copper are among the most important of the economic minerals of this State, and they are distributed over very wide areas. Copper was really the first metal to be worked in New South Wales, for in the year 1845 its ores were being mined at Molong, and also at Canowindra. Since that date there has been a large number of copper-mines worked with more or less payable results. The best-known mine is, undoubtedly, the Great Cobar, and its prospects at the present time are exceedingly good. In addition there are the Nymagee, the Burraga, and the Crowl Creek copper-mines,

all of which are in a profitable condition, and many other deposits of a smaller type. The total value of the copper produced in the State up to the end of the year 1905 was £7,667,453.

Iron smelting has not yet become a national industry with us; nevertheless, there is every reason to believe that it will shortly be established—in fact, the Government has only recently accepted a tender from W. Sandford, Limited, for the supply of iron and steel for State requirements for the next seven years, one of the conditions of the contract being that the metal is to be produced from New South Wales ores. Smelting operations will shortly commence at Lithgow, which is favourably situated for the purpose, as there is an unlimited supply of coal there, limestone for fluxing purposes is procurable in great quantities in the neighbourhood, and immense deposits of good iron-ore are known to exist at Carcoar and at Cadia, distant from Lithgow by rail about 90 and 95 miles respectively. It is estimated that the Carcoar deposit contains at least 3,168,000 tons, while at Cadia there are probably about 39,000,000 tons, including from 4,000,000 to 10,000,000 tons of the best quality.



REDFERN RAILWAY STATION.

An attempt to smelt New South Wales iron-ore was made at Mittagong as early as 1865, and ten years later a similar experiment was tried at Lithgow. In both instances the enterprise failed for financial reasons, although extremely good iron was produced. The principal causes of failure were the high price of labour, the cost of carriage of coal and limestone, and the fact of Sydney being a free port. The conditions are altogether more favourable at the present time, and it is therefore hoped that we are on the eve of the successful establishment of the industry.

The metal platinum has been found in several places in the State, the most important deposits being in the neighbourhood of Fifield, to the north-west of Parkes. The platinum occurs associated with gold in alluvial leads, the depth of sinking being from 60 to 70 feet. Both the platinum and gold are in fairly coarse water-worn grains, and occasional nuggets are found; the largest piece of platinum hitherto recovered in this locality weighed 27 dwt. The total value of all the platinum won up to the end of 1904 is only a little over £16,900. This is mainly owing to the fact that Fifield is situated in an extremely arid district, and there is generally a great scarcity of water for treating the alluvial wash-dirt.

New South Wales possesses considerable deposits of various kinds of marble, but the fact that these are of decided commercial value has only recently been demonstrated; there is now every reason to believe that an important industry in New South Wales marble will soon be established. In addition to pure white stone an infinite variety of colours and patterns is met with, some of the red and yellow coloured marbles being of especially good quality, said by experts to be the equal of

any in the world. Hitherto the best samples have been obtained in the Bathurst district. The value of the marble raised during the year 1905 is estimated at £2,420, which is an improvement of £820 on that for the year 1904. The quarries are being more extensively opened up, while the imported marble is gradually being displaced.

It is rather remarkable that in a country where so many useful metals occur, gems should also be a feature of the mineral production ; but such is the case in New South Wales, where diamonds and precious opal are fairly abundant. Precious opal is the most important of these, so far as production is concerned, and at White Cliffs, about 60 miles north of Wilcannia, some 2,000 people are supported

Gems.



WASHING GOLD.



CRADLING GOLD.

by the opal mines. Some of the precious opal from White Cliffs is extremely beautiful in appearance, and the choice varieties are readily sold at high prices, £30 per ounce being a not uncommon price for the stones in the rough. The estimated value of the opal recovered prior to the 31st December, 1905, is £932,599.

Diamonds have been known to occur in New South Wales for about forty years, and their distribution is very widespread. The principal localities in which they have hitherto been won are Bingara, and the neighbourhood of Inverell. Although many thousands of diamonds have been obtained in the tertiary gravels of these districts, they are mostly of small size, the largest of which there is any authentic record weighing rather less than 7 carats. Quite recently, however, a fine diamond weighing $28\frac{5}{16}$ carats has been discovered in a new locality, viz., Mount Werong, about 30 miles to the south of the town of Oberon. This find is very encouraging, as proving that really large stones are in existence, and it may be expected to stimulate diamond prospectors to more systematic search.

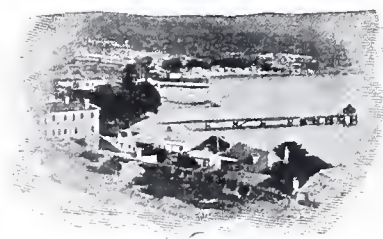
Amongst other metals and minerals occurring in New South Wales

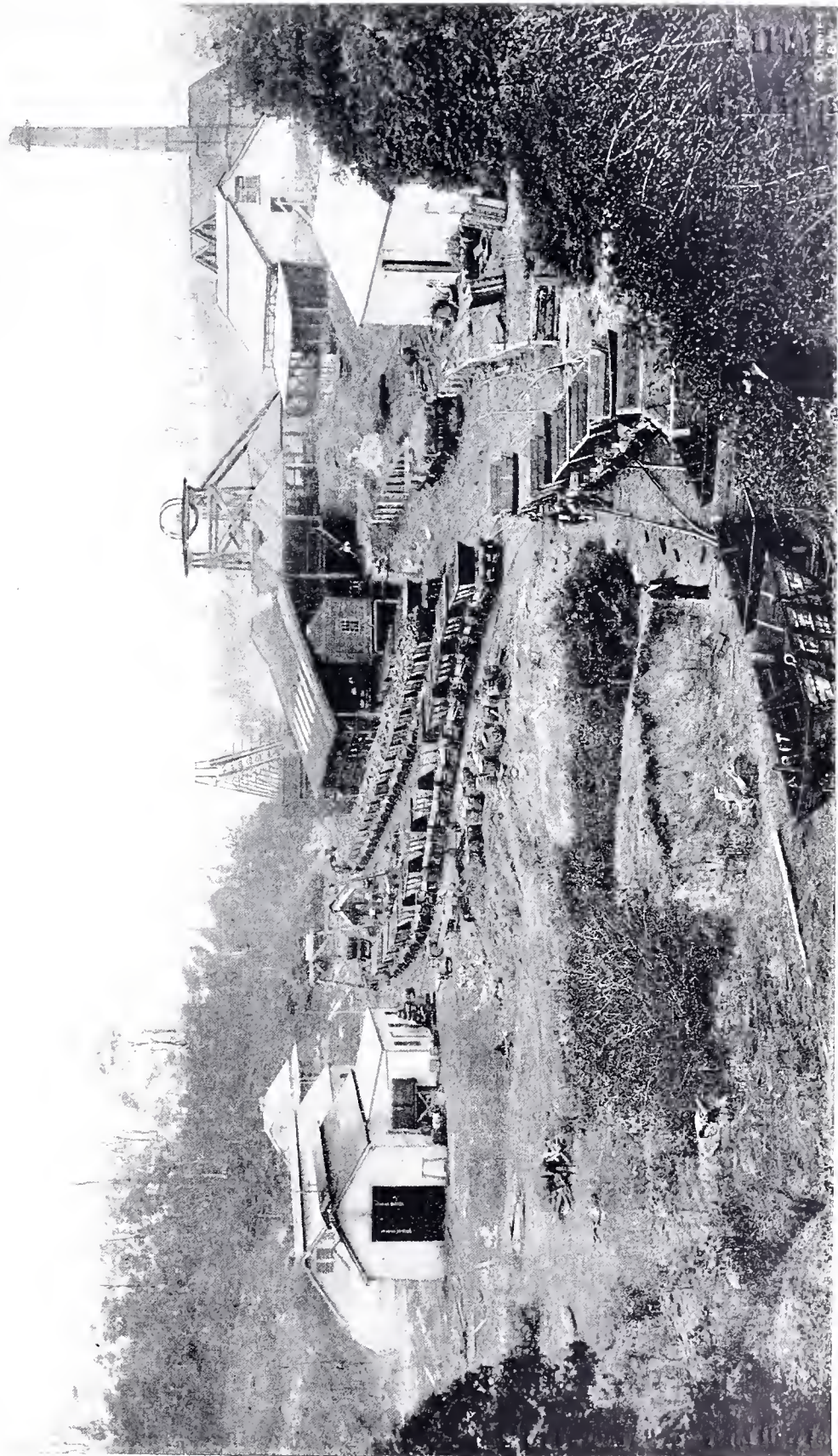
Other Metals. are zinc, lead, aluminium, cobalt, nickel, manganese, antimony, bismuth, mercury, chromium, tungsten, molybdenum, kerosene shale, graphite, emeralds, turquoise, sapphires, alunite, asbestos, diatomaceous earth, &c. The following table gives the mineral production for the year ending 31st December, 1905 :—

Mineral.	Quantity.	Value.	Mineral.	Quantity.	Value.
	tons.	£		tons.	£
Alunite	2,702	6,750	Limestone flux	14,941	9,519
Antimony (metal and ore) ..	388	5,221	Marble .. .. .	.....	2,420
Bismuth (metal and ore) ..	55	20,763	Precious opal .. ..	.....	59,000
Chrome	52	62		oz.	
Coal	6,632,138	2,003,461	Platinum	398	825
Coke	162,961	100,306	Silver (ingots and matte) ..	417,520	} 2,494,052
Copper (ingots and matte) ..	7,774	} 511,754	Silver-sulphide and silver-lead	tons. 27,799	
Copper ore	482			oz. 413,648	
	cts.		Silver concentrates and ore	38,226	21,247
Diamonds	6,354	3,745	Shale (oil) .. .. .	.....	325
	oz. fine.		Building stones	804	} 173,806
Gold	274 267	1,165,013	Tin (ingots)	715	
Grindstones .. .. .	.....	213	Tin ore .. .. .	.....
Portland cement .. .. .	.....	88,100	Zinc (metal and concentrates)	103,533	221,155
Iron (made from scrap) ..	4,447	85,693	Sundry unclassified mineral	.....	21,892
Iron oxide	542	417			
Ironstone flux	6,801	4,525			
Lead	211	2,657			
Lime	18,018	15,019			
			Total value of annual mineral production	.....	£7,017,940

Fuller information in regard to the mineral industry can be obtained from the following Government publications :—

1. A Guide Book for the use of Prospectors in New South Wales.
2. The Mineral Resources of New South Wales (Pittman).
3. The Copper Mining Industry and the Distribution of Copper Ores in New South Wales (Carne).
4. The Iron Ore Deposits of New South Wales (Jaquet).
5. The Kerosene Shale Deposits of New South Wales (Carne).





COAL PIT, MEREWETHER NEWCASTLE.

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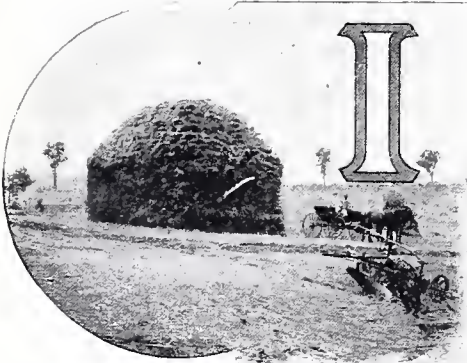


Orient Royal Mail Liner "ORONTES"—9,023 tons.

Employment for Immigrants.

Good Openings for Agricultural Labourers—Opening up of new areas of land means increased activity in all branches of employment—Some instances of individual success.

BY F. C. GOVERS.



IMMIGRANTS to New South Wales will find that a considerable expansion in agricultural activity has led to opening up new areas of country, and to a steady demand for skilled agriculturists. The artisan is not at present so much in request, although it follows that, as the rural industries expand and develop, more and more employment will be found for the town and city worker. Every furrow turned sends a recurring ripple of demand across the whole surface of the labour market. Within recent years the Legislature has de-

voted considerable attention to industrial relations, and legislation now stands on the statute-book providing for the pacific settlement by arbitration of industrial disputes without the distress and suffering which inevitably follow in the wake of a strike.

In view of the fact that at present New South Wales does not offer many openings to mechanics or artisans, it is not necessary to refer, except in a cursory way, to any employment other than that allied with the soil.

What is immediately required in New South Wales is a vigorous and earnest attempt to develop the soil, and the other avenues of employment will of necessity open up in due course. The more people we settle on the land, either as proprietors or labourers, the greater will be the need for an increased supply of carpenters, blacksmiths, painters, tailors, bricklayers, plasterers, millers, butchers, and bakers. It has been truly said "All wealth comes from the soil"; existence would be impossible without cultivation of the land; and it matters not whether we look at the work performed by the carpenter and blacksmith or that of the butcher and baker, each in his way is equally dependent upon the soil for an existence. Thus as new settlers establish themselves upon the land, the greater will be the scope for other classes of workers.

Now let us take a fair and reasonable view of the position in which the
The “man on the land” finds himself. He may start in a small way, perhaps
Farm Labourer’s getting a few shillings a week in addition to his board and lodging, but by
Prospects. dint of thrift and steady perseverance he will manage to save sufficient to
justify him in launching out on his own account, and the experience he
gains on “the other man’s farm” will be worth more than could well be estimated in cash. It
is frequently said nowadays that no man should be allowed to go on the land who does not
possess sufficient capital to make his area clear within a reasonable time. This may be sound
enough in a general way, but everything depends upon the man. Where one man will toil
strenuously and ultimately succeed in providing himself with a comfortable home, happily estab-
lished on a freehold area, another man will fail, and ignominiously too. To the man with pluck
and industry a bright future is assured. As a sample of what may be achieved by the right
sort of man, the case of Mr. Aylett, of Coolamon, New South Wales, may be quoted. Twenty
years ago Mr. Aylett walked into the Coolamon district. He hailed from Victoria, and was
looking for work, or, to put it in the colloquial way, he was carrying his swag. To-day he
has a well-improved farm, while his orchard is a wonder to every practical man who visits the

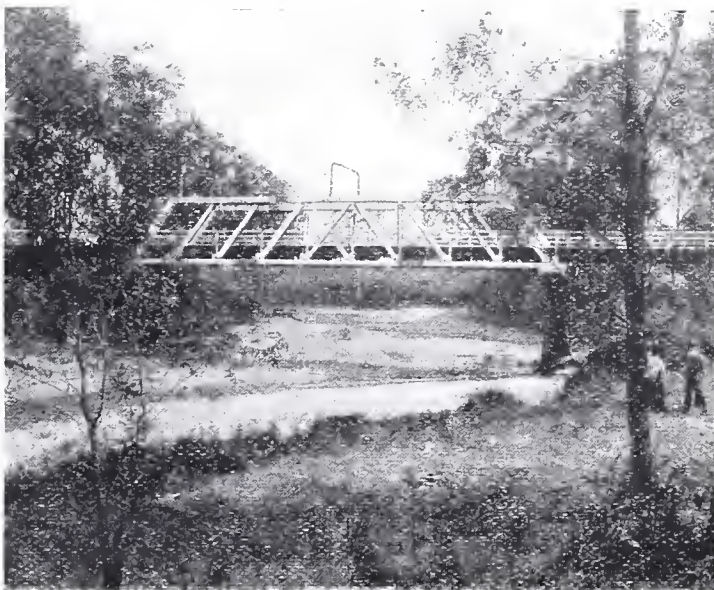


A GOOMBARGANA FLOCK.

district. One can see by the shape of the trees planted seventeen years ago that he had much to learn, while the appearance of those which have been put down in recent years proves that the knowledge has been gained. Often when a large proportion of the peaches going into the Sydney market is realising 1s. 6d. and 2s. per case, peaches from this orchard—300 miles from Sydney—fetch 7s. 6d. per case.

This is not an isolated instance of the success which awaits the sound
Not an Isolated and practical man who embraces opportunities as they are offered. The

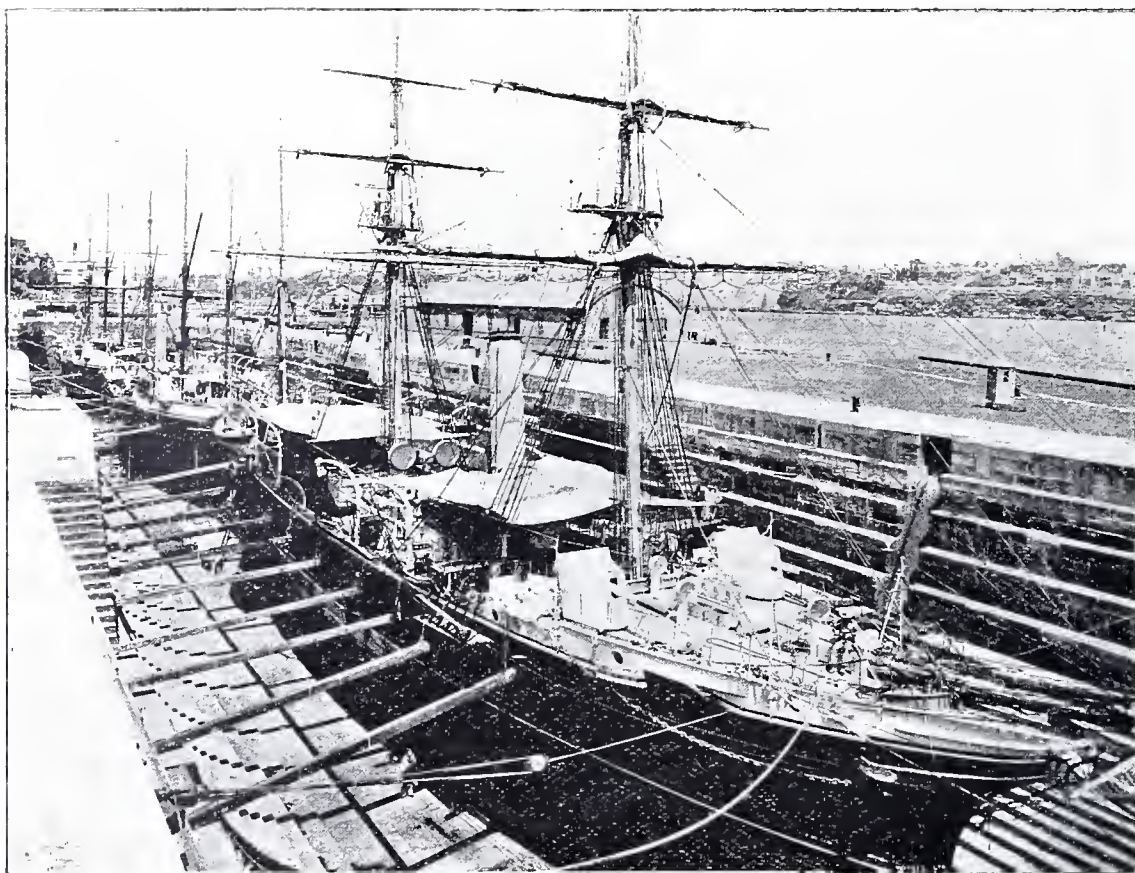
Instance. man who is willing to work and save a fair proportion of his wages will, by-and-by, find that he can reasonably make a start as a farmer on the “shares system,” in which only a small capital is necessary. With fair average seasons and close attention to his work the “share farmer” soon finds himself able to pay a deposit on a farm, and make a fairly good start as a proprietor. This should be the true aim of every farm labourer. All will not succeed, but the farm labourer is not alone in that respect. In almost every walk of life some inducement and reward are offered for close application and honest attention to duty, but it is not for all to reach the goal. The farm labourer’s chance of gaining his desires is infinitely superior to that of his brother in other walks of life. He has greater scope and better opportunities, and the employment of skill, energy, and industry will bear its own reward; whereas, in other avenues, a struggling employer, verging on bankruptcy, or a man who adopts the “sweating” system, can break the heart of the best artisan or tradesman under his charge, until that individual revolts, and then makes a fresh start at the same business, probably on worse terms than before.



QUAAMA BRIDGE, NEAR COBARGO.

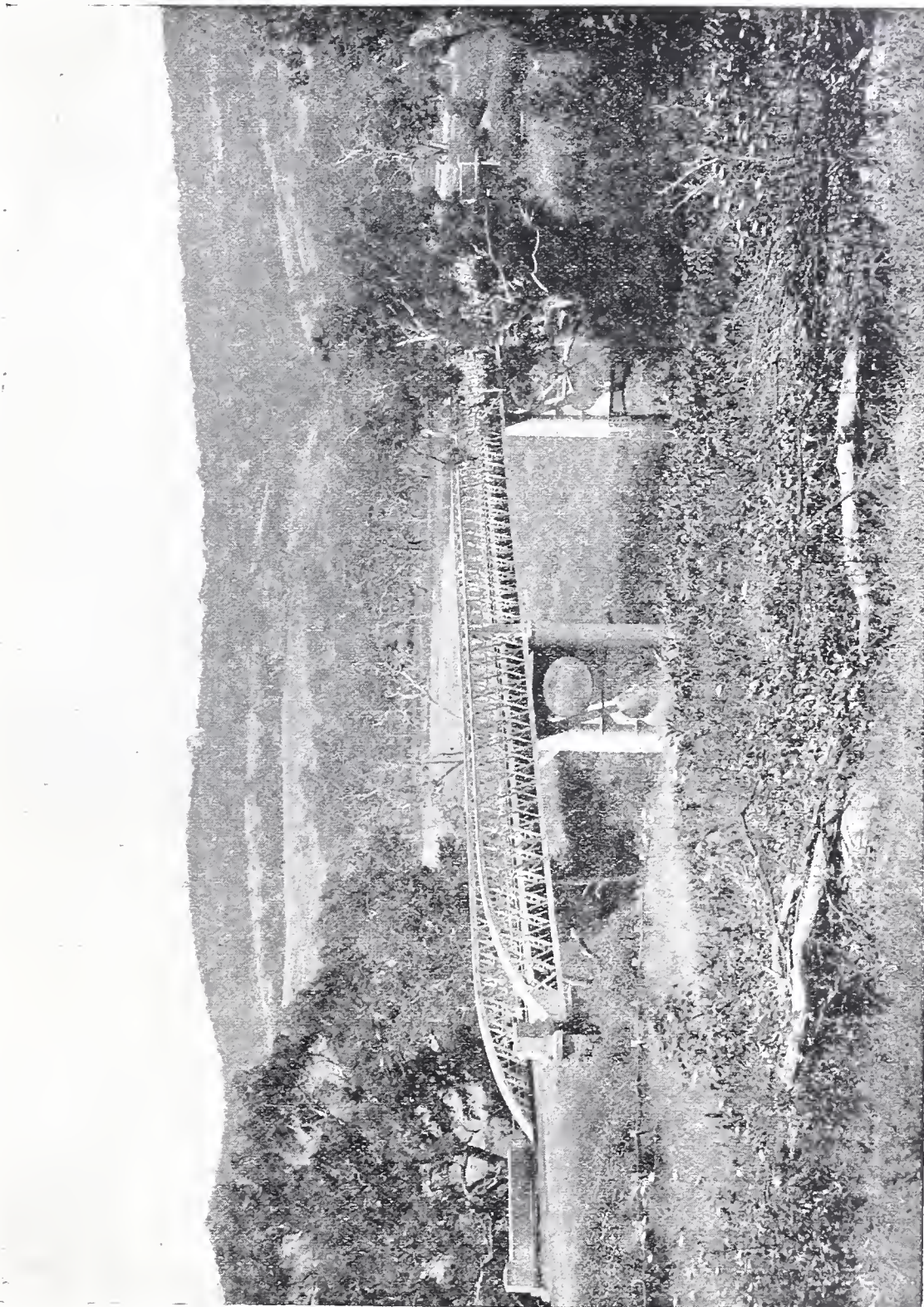
With farm labourers the case is different, especially in a country which
Recruits is essentially an agricultural and pastoral one. Hundreds and thousands of
wanted. fresh acres are being put under the plough each year. These new areas are not monopolised by the original farmers. The farmers’ sons and other young men who have served their apprenticeship to the business have made a start for themselves, and thoroughly understand the task they have before them. They are sure of success—at least as sure as one can reasonably be of anything. They have chosen their land in a district whose climatic conditions they thoroughly understand; they have considered

the opportunities afforded for getting their produce to market ; they have looked sufficiently far ahead to see that their financial position is strong enough to provide for the early calls incidental to settlement in new regions ; in short, they have worked out their scheme in a practical and business-like fashion, and nothing but the worst of bad luck can rob them of the victory which lies before them. To fill the places of those who make a start for themselves, recruits are wanted, and not only are they wanted to supply the gaps thus made, but fresh fields of employment are opening up by reason of these new farms requiring help. So that the position of the farm labourer in such a country as New South Wales is one which offers better prospects and brighter possibilities year by year.



SUTHERLAND DOCK, SYDNEY HARBOUR.

At no time in the history of New South Wales have the potentialities
A Start of the soil been so keenly appreciated and recognised ; and what wonder
on “**Shares.**” is it when one looks at the results which have been achieved by those who
derive their living from the land. On authentic information it has been
gleaned that a farmer in one of our wheat-growing centres reached New South Wales from
Yorkshire five years ago, and—not having sufficient capital to start for himself, as well as
being without experience of local conditions—decided to start wheat-farming on the “shares”



BRIDGE OVER THE MURRUMBIDGEE RIVER.



SINKING A WELL.

so that he could get the friendly advice of the land-owner when needed. Up to the end of the last harvest this farmer sold £4,200 worth of wheat from the area under cultivation, and half of this amount belonged to himself. Wheat is not the only crop from which money can be made. Some of the best wheat land in New South Wales is in the New England district,

but many of the sturdy farmers in that neighbourhood prefer to put small areas under potatoes, and the results are phenomenal. A gross return of £40 an acre has been obtained in many places, and the expenses attached to the digging of the crop are very light—about 8s. 3d. a ton. It will thus be seen that the prospective potato-grower can make a very nice income out of a few acres of land well prepared for that vegetable.

The young man from the United Kingdom and other countries, who has been brought up on a farm and thoroughly understands the routine work, will find no difficulty in securing employment in first-class agricultural and dairying districts at the current rate of wages, viz., 15s. per week, with board and lodging found. In many districts the best farm hands are paid 20s. per week, but these wages are not usually offered until the employer is certain that his man is thoroughly competent and careful of his (the employer's) interests. During the harvest, which usually lasts from five to eight weeks, additional remuneration is given to all farm hands employed on that work, by way of reward for the extra hours they are called upon to toil in the field, and this usually works out at the rate of double pay. The skilled ploughman, the teamster, and others whose duties involve greater responsibility than is usually attached to the farm labourer's position, will readily command 25s. per week and their keep.

For the youth who has had no farming experience whatever, excellent openings are offered by successful and competent farmers, who are willing to instruct these young men in every branch of farm work, so that in two or three years they will feel justified in making a start for themselves. These openings should specially appeal to the young man who is able to command some capital as soon as he shall have gained the requisite experience. It is found that the farmer is quite willing to pay deserving youths small wages in return for their services, in addition to giving careful and useful instruction in all matters appertaining to farm life. The wages offered range from 5s. to 10s. per week, according to the lad's age and his degree of usefulness. After a time,

of course, these youths become sufficiently competent to undertake more responsible duties, and the farmer will be agreeable to increase the wages so that they may be in accord with the value of services rendered.

Every facility is afforded to the new arrival in the way of indicating to him the best districts to visit. The Intelligence Department at Sydney is in daily communication with persons in the rural districts, and the exact state of the labour requirements in any locality is always ascertainable: apart from that, positions are in most cases actually available for the immigrant on arrival, so that all he need do is to present himself at the Department—he is met at the steamer on arrival and given full directions—and the rest is easy, so far as he is concerned.



CUTTING MAIZE FOR ENSILAGE.

Women and Girls. Exceptional opportunities are offered to industrious young women and girls, for there is an unlimited demand for every kind of female servant, especially cooks, laundresses, and housemaids. The wages range from £20 to £52 per annum, with board and lodging. These persons would find no difficulty in obtaining situations in Sydney and suburbs immediately after landing, and the country districts can also absorb a large number.

Other Classes of Labour. As already pointed out, the demand for other classes of labour is not usually in excess of the supply, but a limited number of the very best men in their own particular line will have little difficulty in securing suitable posts, although it would, in all such cases, be preferable to make full inquiry beforehand, so that employment will be assured on arrival. For the benefit of those who may be interested in the question of wages paid to the various trades, the following statement, prepared from the Statistician's returns, may prove of service:—

1906.

Aerated water bottlers, 35/-
Boat builders (average, 40/-), 54/-
Bookbinders (average, 50 -), 52/-
Bootmakers, female machinists (average, 12/6), 15/-
Bootmakers, male (average, 38/-), 45/-
Brewery hands, 36 - to 44 -
Cabinetmakers (average, 50/-), 52/-
Dressmakers, 12/6 to 20/-
Gasworks labourers, 40/-
Milliners, 12/6 to 20/-
Paper bag makers, females, handwork, 15/- to 18/-
 " " " mach'nists, 16/, to 20/-
 " " males " 20/- to 40/-

Paper box makers, females, 25/-
 " " males, 40/-
 Sawmill labourers, 36/- to 40/-
 Tailors (coat hands), 45/- to 55/-
 " " females, 20/- to 25/-
 " (trousers and vest), 10/- to 22/6.
 Tanners, 43/-
 Tobacco (piecework)—
 Cigar makers, females, 23/-
 " " male, 40/-
 Upholsterers, male, 52/-

Able seamen, £7.
 " " (sailing ships), average, £5.
 Engineers, chief, £20 to £27 10/-; 2nd, £16 to £19; 3rd, £14 to £15; 4th, £12.
 Firemen, £8 10/- to £10.
 Officers, chief, £14 to £17; 2nd, £11 to £13; 3rd, £9 to £10; 4th, £8.
 Trimmers, £6 10/- to £7.

Able seamen, £7 (6-hour watches).
Firemen, £9 to £10.
Trimmers, £7.

Deck-hands, 20/- to 35/- per week.
Firemen, 35/- to 42/- per week.
Masters and engineers, 60/- to 70/- per week (60 hours).

Blacksmiths (country), station, 30/-; general (without
rations), 50 to 60/-
Boundary riders, 15/- to 20/-
Bullock drivers, 22/6.
Dairy hands, 12/6 to 20/-
Farm labourers, 15/- to 20/-
Harvest hands, 30/-
Horse team drivers, 20/- to 25/-
Married couples (without encumbrances), farm, 25/-
station, 27/- to 30/-
Orchard hands, 10/- to 20/-
Rousabouts and shed hands, 12/6 to 15/-
Shearers (no rations), 20/- per 100 sheep.
Stockmen, 17/6 to 20/-
Useful boys, 5/- to 12/6.
Vignerons, 15/- to 17/6.

Cook and laundress, 15/- to 20/-
 Cooks (female), 15/- to 30/-
 Cooks (male—hotels), 25/- to 80/-
 Gardeners, 12/6 to 25/-
 General servants, 8/- to 18/-
 Grooms and coachmen, 15/- to 20/-
 House and parlourmaids, 10/- to 14/-
 Laundresses, 20/-
 Nursemaids, 6/- to 10/-
 Porters, 20/- to 30/-
 Waiters, 15/- to 30/-
 Waitresses (board only), 12/- to 15/-



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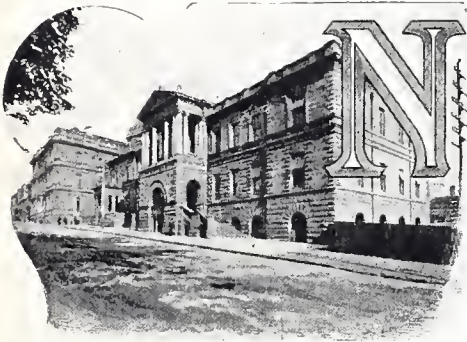
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Educational System.

By G. NASH,

EDUCATION DEPARTMENT.



NEW SOUTH WALES has a liberal State-controlled system of education. Although not completely free, it is almost so—the school fee being but three pence per week for each child, and where more than four children of the same family attend, the aggregate weekly fee is one shilling. There is a network of schools extending right throughout the country, in every locality where an attendance of even nine or ten children can be maintained. The State, however, is not content with

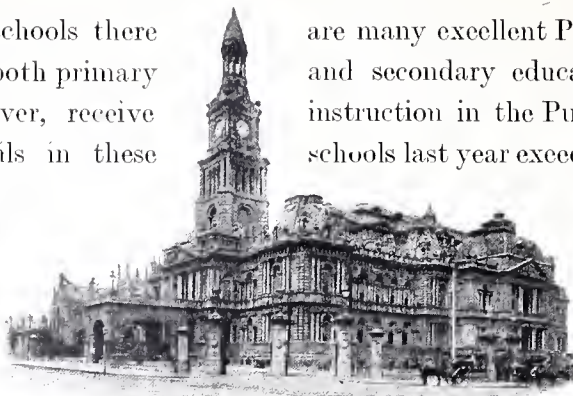
this, and it has resolved that no family, however humble or however remote from the large centres of population, shall be without the means of education. In sparsely-populated places, therefore, where there are not sufficient children to warrant the establishment of the smallest class of school, but where two or more families combine to engage a private tutor or governess, the State grants a subsidy ranging to £25 a year towards the teacher's salary. If properly qualified, the teacher thus chosen may be a member of one of the families interested. The schools, however, are so fully distributed over the length and breadth of the land that, notwithstanding the great extent of territory (as elsewhere stated it is about six times the size of England), there are only 138 cases in which it has been found necessary to grant such subsidies.

In order to obviate the growing necessity for establishing a multiplicity of small schools, the centralised school is becoming a prominent feature of the administration of the Public Instruction Department. These schools can be equipped more efficiently and provided with a better staff than the smaller ones, and the children are conveyed to and from them in suitable vehicles, free of charge. School pupils are also allowed to travel free by rail to the school nearest their home.

Last year, 1905, there were 2,841 schools in operation in New South Wales, ranging from the small Provisional School, with its attendance of eight or nine pupils, to the High and Superior Schools, with average attendance frequently over a thousand. In

* Since writing the above, the Minister of Public Instruction, the Honorable B. B. O'Connor, introduced a Bill in the Legislative Assembly, which has now passed through its final stages in that Chamber, making primary education entirely free.—G.N.

addition to the State schools there schools and colleges for both primary of the children, however, receive the enrolment of pupils in these at school for at least year is obligatory upon 6 and 14 years of age, miles of a school, unless can be shown. There all classes at present Education Department.



TOWN HALL, SYDNEY.

are many excellent Private and Denominational and secondary education. Over 80 per cent. instruction in the Public Schools of the State—schools last year exceeding 233,000. Attendance

70 days in each half-all children, between who reside within 2 just cause of exemption are 5,560 teachers of employed under the Of this number, 56 per

cent. are males and 44 per cent. females. To recruit the vacancies in the teaching staff caused each year by retirements, resignations, death, or other causes, about 300 new appointments are made annually. Candidates are selected on competitive examination, and are appointed as members of the Public Service by the Governor in Council. Before appointment they must pass the necessary medical test, and also assure their lives in order that when they retire from the service they shall have made provision for their old age. The salaries of principal teachers range from £100 to £400 per annum, exclusive of vested residences or rent allowance in lieu thereof, and the salaries of assistant teachers range between £72 and £250 per annum. Inspectors of schools are generally chosen from the ranks of the teachers.



A CENTRALISED SCHOOL—CHILDREN IN CONVEYANCE.

Instruction. The teaching in the State Schools is strictly non-sectarian, but general religious teaching as distinguished from dogmatic theology forms part of the course of instruction. Recognised clergymen or other teachers authorised

by their church have also the right to visit the schools and give one hour's religious instruction daily to the children of their own denomination whose parents so desire.

The course of secular instruction proceeds in successive stages from the Kindergarten work in the Infant School, to the higher course of instruction leading to the University, in the Superior and High Schools. The course comprises English, Mathematics, Nature Knowledge, Science, Civics

and Morals (including English and Australian History), Art and Manual work (including Needlework), Vocal Music, Drill and Physical Culture, Literature, Ancient and Modern languages. As pointed out in the Syllabus of Instruction, "the course aims at a broad general education, with a special direction of the knowledge and training of the pupils towards the class of employment they are likely to enter after leaving school." Shorthand, typewriting, and elocution are taught in special classes. The elder girls who have completed the course of hand-sewing are taught to use the sewing machine, and to cut-out, measure, and calculate the cost of the material required for garments. Cookery is taught in central schools in various districts by specially-trained teachers. The elder girls in the neighbouring schools attend these central schools on certain days during the week for this instruction, which is of a thoroughly practical character. Considerable attention is given to the subjects of Hygiene, Sanitation, and the care and feeding of sick children and invalids. One of the medical officers attached to the educational staff is a lady physician, who, in addition to giving lectures to the female students in the Training College, visits the larger schools and gives systematic courses of lessons to the girls in the more advanced classes.

The School Bank. The school garden, school bank, and school library play important parts in the school life of the State.

The school garden is usually divided into plots, cultivated and worked by different sections of the pupils under the guidance and direction of the teachers. Practical lessons on agriculture, horticulture, and botany, with the life history of plants are thus afforded, and a taste for the beauties and wonders of nature cultivated. In connection with the school banks, teachers clearly understand that the object of their



ST. ANDREW'S COLLEGE.



establishment is not to for saving up money to but to inculcate habits of. Viewed in this light these educative value, and are which they were intended. these banks in 1887, the £260,000 and the with-latter sum, about £63,000 was withdrawn for the purpose of being placed to the credit of the children's own accounts in the Government Savings Bank.



give facilities to children be spent during holidays, thrift and self-reliance. Institutions have a special fulfilling the objects for Since the establishment of deposits have totalled drawals £248,000. Of this

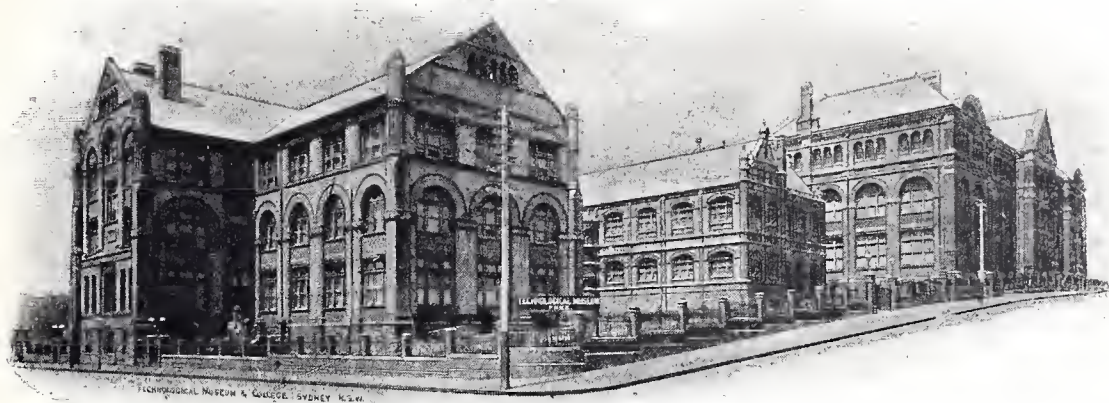
Another never failing source of pleasure and profit to the children is **Over-sea Correspondence.** the interchange of letters between them and their cousins across the seas. In these youthful epistles, which the teachers take care shall be the pupils' own, the children tell of their home life and surroundings, the interests which enter into their school life, their holiday excursions, life on the great sheep stations, and on the selector's homestead, the fauna and flora of the bush—the curious kangaroo, the enigmatical platypus, the laughing gibbon, the red-billed black swans, the golden wattle, the white flannel flower, and that red blaze of imprisoned sunshine—the flaming waratah. In return, they get whiffs of life from the great pine forests of Canada, from the veldt and African farm, the snow clad Andes, the sun-searched plains of India, the Scotch heaths and the green lanes of England and Ireland.



PUBLIC SCHOOL CADETS ON PARADE.

**Physical
Culture.**

Getting away from the literary and mental aspects of our school life, we turn to the physical culture, drill, and calisthenics, to which a portion of the schooltime each day is devoted. The magnificent displays given annually by the school children under the auspices of the Public Schools Athletic Association bear excellent testimony to the quality and quantity of the work accomplished in this direction. Drill Instructors and Cadet Staff Officers pay regular visits to the schools,



TECHNICAL COLLEGE, SYDNEY.

and thousands of the schoolboys receive special military training as cadets, apart from the ordinary school drill. They are taught the art of rifle shooting. Target practices and parades are held regularly—special attention being given to rapid and orderly entraining and detraining, and to discipline and steadiness. In his visit to New South Wales in 1901, H.R.H. The Prince of Wales, then Duke of York, paid a high tribute to the military bearing and the excellence of the training exhibited by the school cadets forming portion of his guard of honor.

**Technical
Education.**

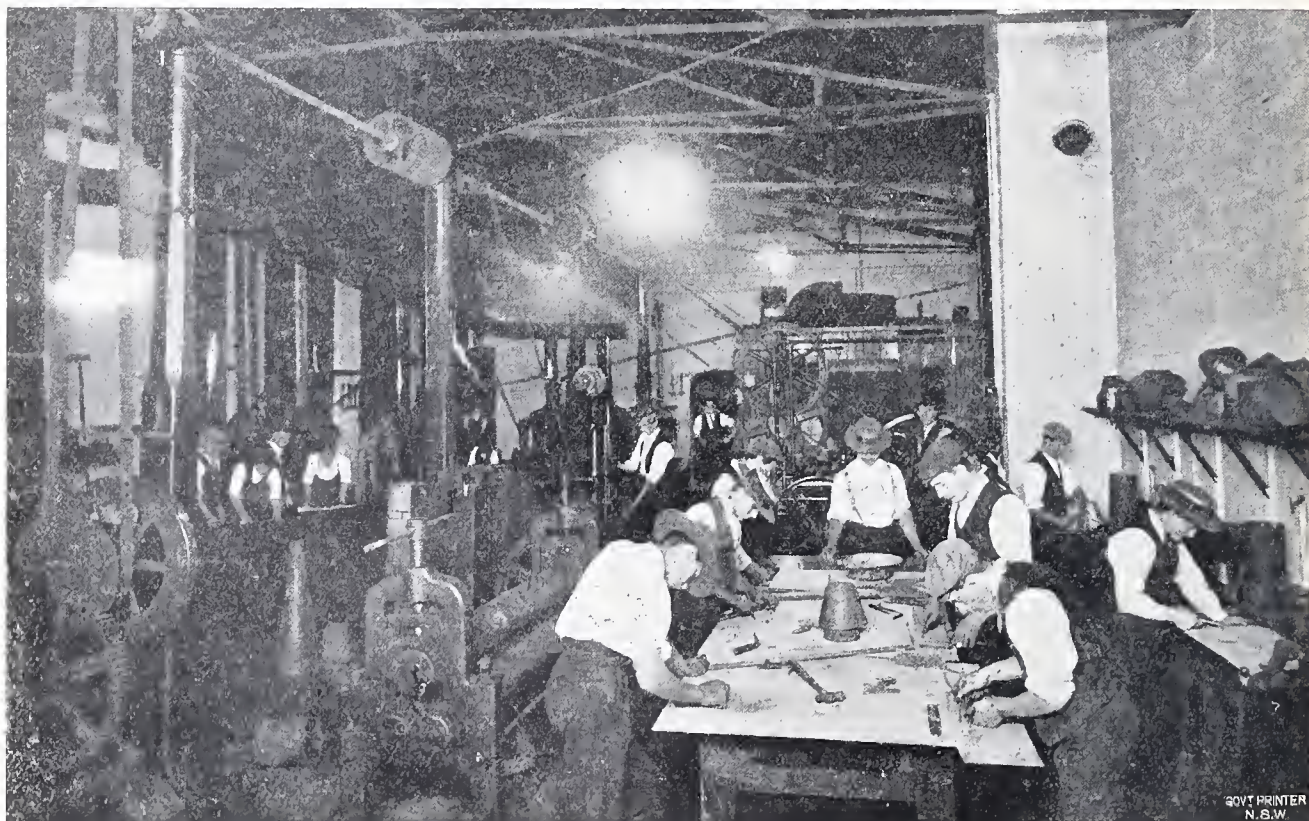
In a comparatively young community such as this, it is but natural and desirable that much attention should be given to Technical Education, and as a consequence no efforts are spared to make this instruction as valuable and widespread as possible. The work of the Technical Education Branch extends throughout the State, and is carried on by means of classes established at the Sydney Technical College, the branch Technical Colleges at Albury, Bathurst, Goulburn, Newcastle, Maitland, Broken Hill, and branch schools and classes at numerous suburban and country centres. At the Sydney Technical College alone, over 4,000 students are in attendance at the classes, which include Agriculture, Botany, Blacksmithing, Farriery, Wool-classing, Chemistry, Assaying, Metallurgy, Mineralogy, Mining, Applied Mechanics, Pattern-making, Boilermaking, Fitting and Turning, Ironfounding, Electrical and Mechanical Engineering, Sanitary Engineering, Plumbing, Architecture, Manual Training, Carpentry, Wood-carving, Drawing, Modelling, Printing, Dressmaking, and Cookery.

The fee for the technical classes varies according to the subject and the number of lessons taken per week. The yearly course consists of three terms, and the fee for the whole

course ranges from 10s. to 25s. per annum in the case of junior, and from 20s. to 50s. per annum in the case of senior students. The junior scale is charged to female students and to male students under 21 years of age, in receipt of wages less than 30s. per week.

In view of the material advantages afforded to students, and the nominal character of the fees, the pressure on the accommodation in the workshops of the Principal Technical College in Sydney has become so great that the necessity has arisen for extending the existing accommodation. Considerable activity in this important branch of education also prevails in the other principal centres, and there are nearly 15,000 students enrolled in the different Technical classes throughout the State. Students who so desire can attend examination each year in the several subjects, and diplomas and certificates are issued on the result of these examinations. Last year more than 4,000 students were thus examined, of whom the great majority were successful.

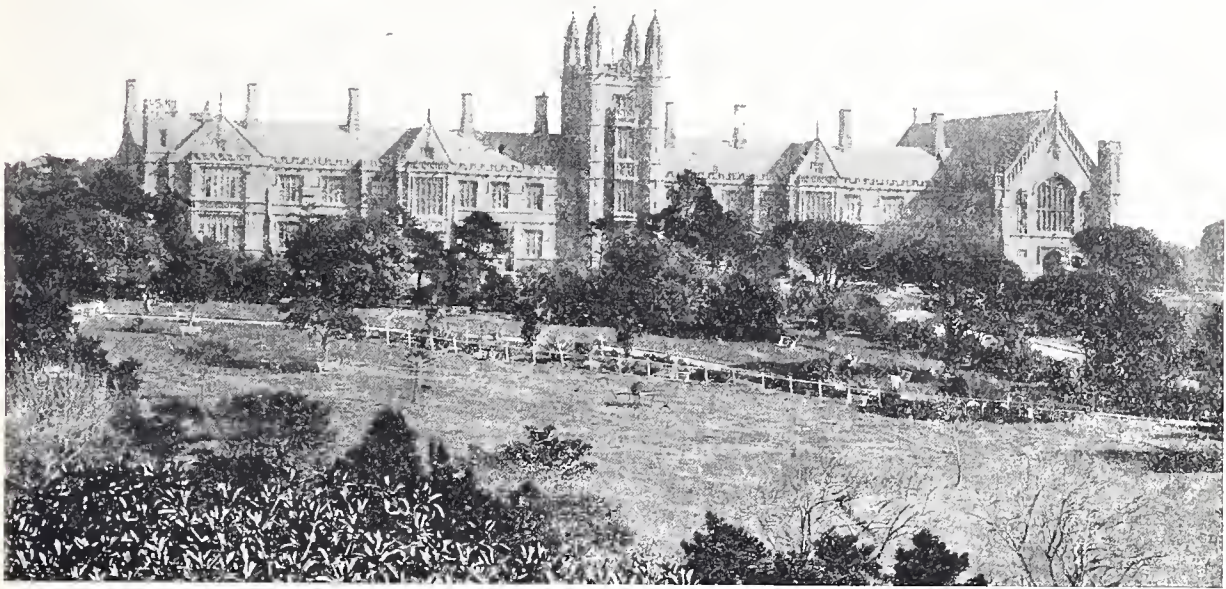
The Technological Museums form a valuable adjunct to the Technical Education Branch. Over a quarter of a million persons visited these interesting institutions during the course of last year to examine the numerous exhibits. A considerable amount of research work is accomplished, and the Museum authorities also heartily co-operate with the Public School teachers throughout the State by assisting them to form School Museums, and otherwise in connection with the science teaching in their schools.



BOILERMAKERS' CLASS, TECHNICAL COLLEGE.

**Sydney
University.**

The Sydney University was incorporated by an Act of Parliament, which received the Royal Assent in 1850. It receives a statutory annual endowment. As pointed out in the University Calendar, the same rank, style, and precedence are granted by Royal Charter to its graduates as are enjoyed by graduates of universities within the United Kingdom. It is also recognised by Charter as one of the institutions in connection with the London University from which certificates of having pursued a due course of instruction may be received with a view to admission to



SYDNEY UNIVERSITY.

Degrees. The University contains four faculties—Arts, Law, Medicine, and Science. Its Degree of Bachelor of Laws is recognised under certain conditions as a qualification for admission to the Bar.

Its Degrees in Medicine and Surgery are registered upon the Colonial List of the British Medical Register. The University is also recognised as one of the institutions from which the University of London is authorised to receive certificates for Degrees in Medicine. The University of Edinburgh accepts certificates of attendance at Medical Classes in this University to the extent of three years of professional study, and the Royal College of Surgeons extends a somewhat similar recognition. The curriculum of study for the B.A. and B.Sc. degrees extends over a period of three years, that for the degrees of LL.B., M.B., and Ch.M. over a period of five years, and that in the School of Dentistry over a period of four years. The Universities of Oxford and Cambridge extend certain privileges to Sydney University students.

For instance, Sydney graduates who comply with certain requirements are admitted as "advanced students" to the Cambridge University. Women students enjoy equally with men the means of the liberal education afforded by the University, an education open alike to "all orders and denominations without distinction whatever." There are various colleges, connected with different religious denominations, affiliated with the University, and a College for Women has also been established. Nine hundred and forty-eight students, of whom 112 were women, attended the University lectures last year (1905).

Various Scholarships and Exhibitions are awarded annually by the Senate, which has also the privilege of nominating one candidate per annum to a Commission in the British Army and to a Military Cadetship at Sandhurst.

Numerous scholarships and bursaries, apart from those given by the University, are awarded annually to deserving students to enable them to complete their secondary education at the Superior Public Schools, Grammar, or High Schools. Bursaries enabling students to proceed to the University courses are also awarded. Last year more than one hundred such scholarships and bursaries were given.

Scholarships to the High Schools are tenable for three years, and entitle their holders to free education and to a free grant of text-books. Bursaries to the High, Grammar, and Superior Public Schools are tenable for the same period, but in addition to the free education and free text-books given in the case of Scholarships, the winners of bursaries are granted an allowance of £30 per necessarily board away one of these schools, £10 per annum where home. The University those granted by the the position of candi-
Matriculation Examina-

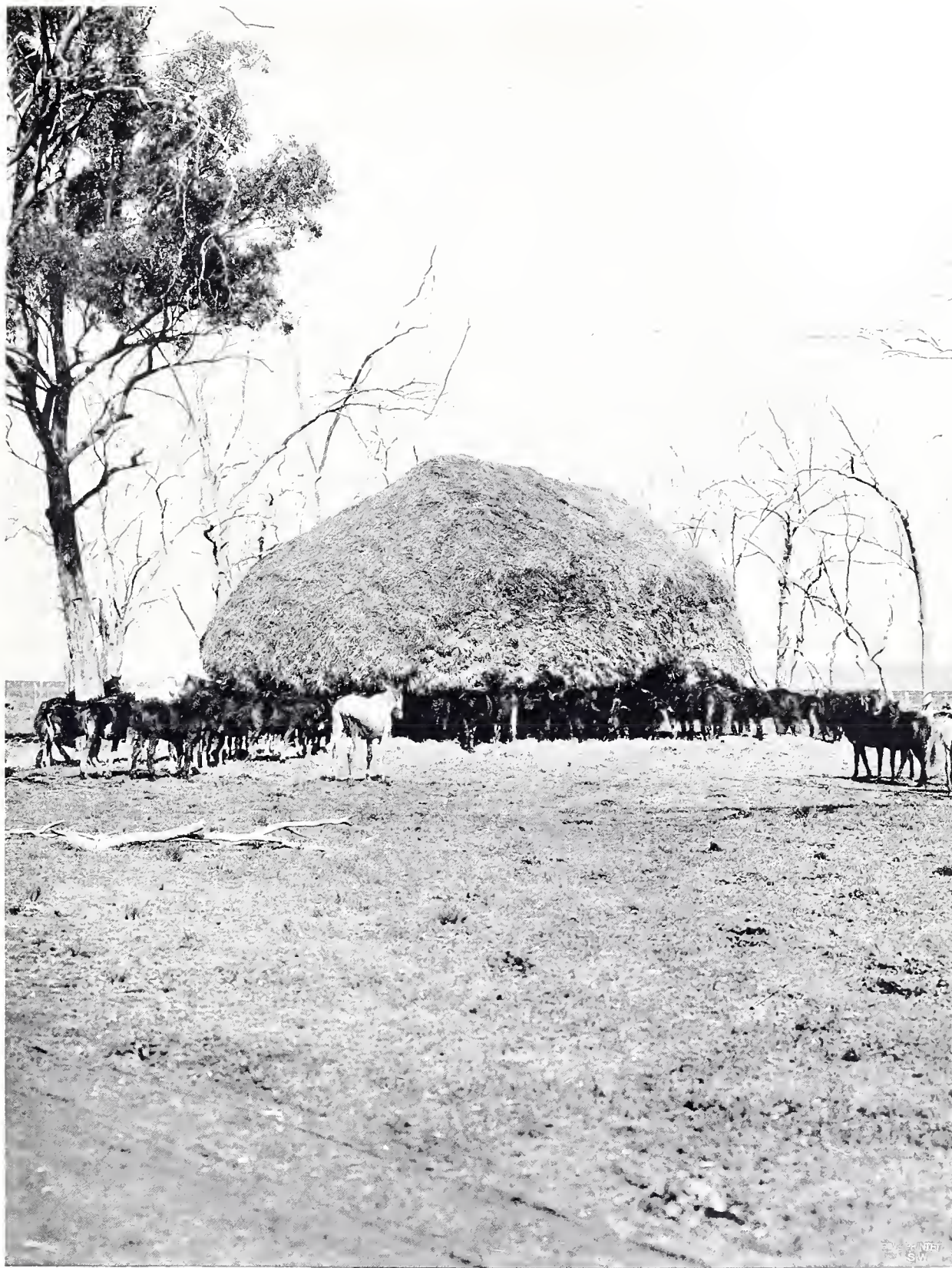


ROYAL PRINCE ALFRED HOSPITAL.

dates are entitled to text-books and to free education for three years at the Sydney University, and a monetary allowance to the extent of £50 per annum to those who must board away from home, and £20 per annum to those students who can reside with their parents or guardians whilst attending the University lectures.

The Scholarships and Bursaries to the High, Grammar, and Superior Schools are open to boys and girls under 14 years of age at the time of the half-yearly competitive examinations. In the case of the University Bursaries the candidates must be under 18 years when matriculating.

By the means afforded through this liberal scheme of scholarships, the doors of the University and of the learned professions are thrown open to all clever boys and girls, whose parents might not otherwise be able to help them on their road to success.



A SCENE ON WOODSTOCK FARM, TAMWORTH DISTRICT.



ARNOTT'S

BISCUITS

FOR

QUALITY

Health and Allied Matters.

BY T. P. ANDERSON STUART, M.D., LL.D. (EDINBURGH),
PROFESSOR OF PHYSIOLOGY, DEAN OF THE FACULTY OF MEDICINE, CHAIRMAN OF THE
ROYAL PRINCE ALFRED HOSPITAL, &C., &C., SYDNEY.



THE information I have to give is chiefly negative. There are no diseases peculiar to New South Wales: there are no peculiar risks of any kind: there are no special precautions to be taken nor provisions to be made prior to leaving the older lands, and in view of settling in New South Wales. People here *upon the whole* live the same life, eat the same sort of food at the same meals, wear the same sort of clothes, live in the same sort of houses, pursue the same avocations, enjoy the same amusements, are exposed to the same diseases and accidents, die the same death, as in the old land—all *upon the whole*, for there *are* differences, though only of minor importance, as we shall presently see. In what follows I attempt to answer probable questions rather than to write a systematic treatise. I draw upon my own experience as an immigrant and a resident in New South Wales of twenty-four years' standing. During this period I have revisited the Old Country four times, when I have been asked many, and sometimes, to me, amusing, questions as to Australia. My aim herein is to tell people what my experience tells me they are likely to want to know.

The voyage may be looked forward to as a real experience and a pleasure, **The Voyage.** by whatever route the settler comes. The chances are that sea-sickness will be got over in the first day or two. Certain happy individuals are never sick at all. There is no remedy for the malady, but I am sure that the frequent practice of eating and drinking more than one ordinarily would is generally a mistake. It is better to take rather less than usual so as not to provoke the stomach to reject its contents, and then as the condition passes away, the appetite gradually returns, and the food deficiency will soon be made good.

Judged by latitude alone, New South Wales is on the edge of the tropics, and to this in part are due the short twilight and the monsoonal rains that often visit us, but following the general law that lands in the southern hemisphere have a temperature lower by about 5 degrees F. than lands in corresponding latitudes north of the equator, the climate is much cooler than is indicated merely by its latitude, and being in the southern hemisphere its

temperature tends to be equable. It is one of the most temperate and uniform in the world. There is no part of the State which is not really pleasant to live in during some part of the year, whatever it may be during the rest.

The coastal region is about 700 miles long, and varies from 30 to 150 miles wide. Its northern extremity may be compared to Sicily as regards mean temperature, and its southern extremity to Rome and Nice; but while the mean temperature is nearly the same as that of these well-known places in the northern hemisphere, the range of temperature is not nearly so great, and this is most important in estimating the healthiness of the country. For instance, Sydney is just about midway between the extreme north and extreme south of this coastal region; its mean temperature is 63 degrees Fahr., or about the same as that of Naples, but at Naples the mean summer temperature is 74·4 degrees, and the mean winter 47·6 degrees—a range of 27 degrees, while at Sydney the mean summer is 71 degrees and the mean winter 54 degrees—a range of only 17 degrees Fahr. Thus in Naples the summer is warmer and the winter much colder than in Sydney. The same conclusion is drawn from the range of most extreme temperatures ever recorded in the two places—the difference between the highest summer and lowest winter



CLIMBING A SNOW-DRIFT ON MOUNT KOSCIUSKO

temperatures ever recorded in Naples being 81 degrees, while in Sydney it is only 72·6 degrees. Owing to the extreme dryness of the atmosphere, high temperatures in New South Wales are not nearly so oppressive as even much lower temperatures would be in London or in France, and the high temperatures do not, as a rule, last long.



JUNCTION OF THE MURRAY AND DARLING RIVERS.

Rain falls much more heavily in New South Wales than in the United Kingdom, so that with a given rainfall there is more dry weather, and when it is dry in New South Wales, owing to the dryness of the atmosphere and its freedom from clouds, the day is generally sunny, and the nights starlit. The prevailing winds greatly affect the climate of different places. On the coast, the moist winds from the sea are apt to make it muggy in summer, but this does not extend far inland. A westerly wind comes from the interior—it is dry and hot in summer, dry and cold in winter. Southerly winds from the Southern Ocean are always moist, but they are cool in summer.

from which the mountains rise, comprise a space varying in width from 120 **The tablelands,** to 200 miles. On the high southern plateau, at an elevation of 4,640 feet, stands the town of Kiandra, having a mean summer temperature of 56·4 degrees, and a winter temperature of 32·5 degrees, corresponding with that of Dumfermline in Scotland. Cooma, in the centre of the Monaro plains, at an elevation of 2,637 feet above sea-level, enjoys a summer as mild as either London or Paris, while its winters are far less severe. On the New England tableland, the climate of Armidale and other towns may be considered as nearly perfect as can be found. The yearly average temperature is 56·5 degrees, while the mean summer temperature only reaches 67·7 degrees, and the winter temperature falls to 44·3 degrees, a range approximating closely to that of the famous health resorts in the south of France.

The rainfall in this region is nearly 33 inches. Here rise Mounts Kosciusko and Townsend to over 7,000 feet above sea-level, where snow is perennial. In this region it is always cool at night, even in summer, and the air is always dry, never muggy, so that one always feels fit and active and enterprising. For every 300 feet of ascent from sea-level the temperature drops about 1 degree Fahr.

“The climate of the great plains, in spite of the heat of part of the summer,”

Interior plains. says Coghlan, “is very healthy, and an inspection of the death-rates, of both children and grown persons, amply bears out this view. The town of Bourke may be taken as an example. Scated in the midst of the great plain of the interior, it illustrates peculiarly well the defects, as well as the excellences, of the climate of the whole region. Bourke has exactly the same latitude as Cairo, yet its summer temperature is 1·5 degrees less than that of the Egyptian city. New Orleans also lies on the same parallel, but the American city is 4 degrees hotter in summer. As regards winter temperature Bourke leaves little

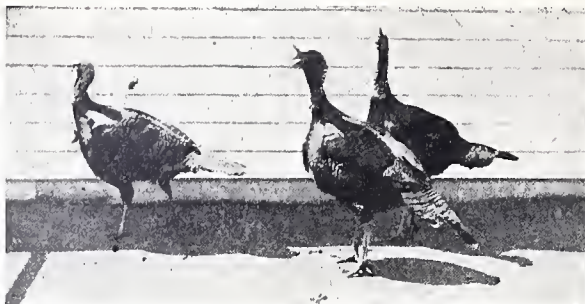
to be desired. The of the thermometer is accompanied as this is absence of snow, the ing and enjoyable."

In this region of all—less than 20 so that in spite of the

occasional days in summer, one does not feel so listless and indisposed to action as on the coast. From this difference, temperatures are quite comfortable in the interior which would be intolerable on the coast. Nowhere in the State is the midday *siesta*, so common in India, indulged in. Punkahs are not used.

"From the standpoint of health, it is fortunate for the country that dryness is one of its characteristics; otherwise, instead of being the abode of health, the interior of the State would, with abundant rains, have become an impenetrable jungle, the lurking-place of those malarial fevers which devastate so many fair regions of the Old World and America. New South Wales may, therefore, be compared favourably with any part of the world; and, taking into consideration the comparatively low latitudes in which it is situated, it offers a most remarkable variety of temperate climates. From Kiandra, on the highest part of the Great Dividing Range, to Bourke, on the great interior plain, the climate may be compared with the region of Europe extending from Edinburgh to Messina, but more generally resembling that of southern France and Italy. It may, therefore, be regarded as peculiarly fitted for the habitation of people of European race, embracing, as it does, within its limits, the climatic conditions under which the most advanced races of the world have prospered." (Coghlan.) I know of no evidence of any deterioration of the Anglo-Saxon people due merely to residence in New South Wales. A recent writer points out that a great distinction must be drawn between hot dry and hot humid regions. In the former many of the mightiest nations of antiquity had their home, *e.g.*, Ancient Egyptians, Saracens, &c., and Europeans thrive and multiply, while the natives of hot humid climates have always been lacking in hardihood and warlike propensities. Do not Australians hold a high position in all branches of manly sport? The one great need of Australia is population—every other need is small compared with this one.

The four seasons as in Europe. But few of in winter. With spring of leaves. Summer and but the intermediate not so. I think one the seven or eight months contiguous portions of good weather; two



mean winter reading 54.3 degrees, and by clear skies and an season is both refresh-

the rainfall is lowest inches. The air is dry, high temperatures on



are not so sharply marked the trees lose their leaves they get only a new set winter are marked enough, spring and autumn are might say generally that including winter and the spring and autumn are months of summer are

hot at least in the day-time, the remaining two or three months are—well, uncertain. Spring includes September, October, November; summer—December, January, February; autumn—March, April, May; winter—June, July, August.

The houses are of brick, stone, or wood—all depending on the district.

The Houses. The settler's house would probably be of wood—but with a little care in the building these are very comfortable houses. The roof is generally of galvanized-iron—this is good for collecting water. Wooden shingles are also used. Tiles and



A GIANT RED GUM.

slates are commonest in the larger towns. The furniture and all the fittings of a house are just the same as in the Old Country. Furniture, &c., already in the possession of the immigrant might very well be brought, but the cost of packing, freight, insurance, duty, &c., should all be remembered. A bathroom, or some place that serves as such, is found in every house practically, and does not remain unused. The poor man's shower may be a nail-bath with holes

driven through the bottom—this is most efficient, and is very economical of water—a consideration often of importance.

Warming of houses is not so much required as in Northern Europe. In Sydney, for about three months, fires are usual, but in the higher lands very much longer, of course. In any case, it is the night which is cold—the day is generally bright, sunny, and may be warm pretty well all over the State. Coal in Sydney, and on the coast and railway lines, is plentiful; wood is generally burnt in the country. The twilight is short. Coal gas and the electric light in the towns, kerosene in the country, are the usual illuminants. Mosquito curtains are used on the beds at night in many places, but not everywhere, and nowhere in the winter months.

Family life in Australia is identical with family life in the United Kingdom, and the same may be said of domestic habits and organisation in general. One hears much of the difficulty of securing servants, but probably too much of it. A good mistress generally has no difficulty in getting servants here as elsewhere, but the good mistresses are just as difficult to get as the good servants. So many people are well enough off to have a servant, but who do not know how to manage a household, that it is not surprising they cannot keep their servants. The wages are higher than in England, but on the other hand the Australian servant is more generally useful than the English servant, and this compensates for the higher wages.

Clothing is very much the same as in England. Settlers should bring any clothing they have—it will all be useful. White duck clothing—copying Indian and China customs—used to be common in Sydney, but the use of this material is now practically given up. Woollen cloth—tweeds, flannels, &c.—are universal. Some thin tweed or flannel garments might be worn on the hotter part of

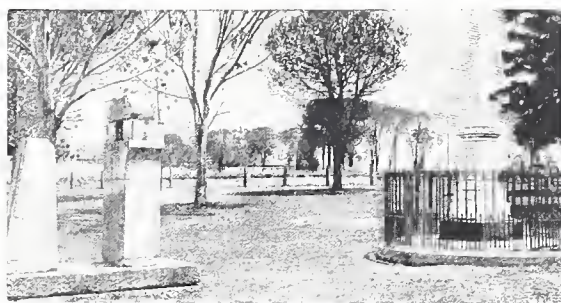


MILSON'S POINT, SYDNEY HARBOUR.

the voyage, and would be useful afterwards. Woollen material is better than cotton next to the skin, for cotton is apt to get wet with perspiration and then lead to a chill. The so-called "cholera belt," or simply a band of flannel round the body, is useful in preventing chills on the voyage. Where "prickly heat" is likely to occur in the hot weather, wool next to the skin may aggravate the itchiness; then silk is better than cotton. At night a pyjama sleeping-suit is best—woollen by preference—especially on the voyage. The so-called "flannelette," made of cotton, is very nice for many purposes, but it should be avoided owing to its great inflammability. Many deaths occur from this cause. Both a heavy and a light overcoat should be brought. Special head-gear is not needed—puggarees are strange, and only worn by the stranger. Ordinary articles of foot-wear are used—a pair of rubber-soled shoes or boots are useful at certain times on the voyage. Tinted spectacles are quite unnecessary. Much of the foregoing is as applicable to women and children as to men.

The fashions are very much up to date. Owing to the rapid communication with Europe we are in nowise behind in this matter, and seeing that our season follows the European season, there is time for the new goods of any season there to reach us before our season comes on. For the same reason also an article of dress is often much cheaper in Australia than it was, say in London, for after the commencement of the season there our buyers can buy on more favourable terms, and of these we get the benefit. It is, therefore, quite a mistake to assume that "anything will do for the Colonies."

There are the same three meals daily as in the Old Country, of the same materials, and cooked more or less in the same way; but owing to its comparative cheapness, meat in some form or other enters pretty well into all the three meals. In this way, while the inhabitant of the United Kingdom consumes per annum 109 lb. of meat, the inhabitant of New South Wales consumes 269 lb. Sugar, also, is much more largely consumed—75 lb. per annum per inhabitant of the United Kingdom, but 109 lb. for each individual in New South Wales. These quantities are not exceeded by any European nation—indeed meat and tea three times a day is a common rule. For tea and coffee the figures are 91 oz. in the United Kingdom and 123 oz. in New South Wales, and for butter and cheese 19 lb. in the United Kingdom and 25 lb. in New South Wales. The quantity of grain consumed is about the same in the two countries. The daily energy obtained from his food by the inhabitant of the United Kingdom is 3,522 foot tons, while the New South Welshman gets 3,982, so that the people of New South Wales are the more fortunately placed as regards their food as a whole. No doubt there is much waste, but nevertheless the foregoing figures show the well-being of the people. This is also shown by the consumption of tobacco, which is nearly twice as great in New South Wales as in the United Kingdom. Fruit is, upon the whole, abundant, but its abundance, price, and variety vary greatly according to the different parts of the country and the seasons and their nature. In the higher and colder regions inland, all the English fruits flourish exceedingly, while in the lower coastal region fruit grows out of doors that only grows in hot-houses at Home. Honey is very abundant, good, and cheap. Garden vegetables grow exceedingly well, but in the towns are apt to be dear; there are great openings for vegetable farmers. Fish is abundant on the coast, but the paucity of rivers makes fresh-water fish scarce inland; in any case, however, it is dearer than it should be—apparently not so much for want of fishermen as from defective arrangements for its distribution. Many of the rivers are now, however, being successfully stocked with English and other introduced fish. Poultry does extremely well everywhere. Game there is, according to the district and season, though there is less than in the Old Country. Rabbits, unfortunately, are too plentiful—but that is another story. In many districts hares now abound.



The beverage of the people is tea ; coffee is not a favourite in Australia, so that the consumption of tea per head is 7 lb. 3 oz. per annum, while that of coffee is only 8 oz. Good beers are brewed in the State, and New South Wales is a wine-growing country, though the people are not a wine-drinking folk. In other parts of the world these two conditions often go together. Whisky is the usual alcoholic beverage in the country. The Australian consumption of proof-spirit per head per annum is 2·27 gallons, while in the United Kingdom it is 3·57. We are, therefore, comparatively a sober people.



TEMORA RAILWAY YARD.

The cost of living may be stated generally as follows :—In the United Kingdom the average annual cost of food and beverages is 42 per cent. of the average earnings ; in New South Wales it is only 38 per cent. This may be stated in another way. Suppose that in the year fifty-two Sundays are deducted and, say, thirteen days' sickness, there remain 300 working days. Of these the inhabitant of the United Kingdom must work 127 days in order to pay for his food and beverages ; in New South Wales he need only work 112 days.

In order to give the reader an idea of the cost of individual articles at the present time, and after the establishment of the Commonwealth has had time to have its full effects, I asked the Honorary Secretary of the Moss Vale Progress Association to furnish me with a priced list of commodities likely to be required by a

settler, and this he had kindly done as follows. Moss Vale is the centre of an agricultural district, on the railway, and 87 miles from Sydney. The prices there may be taken as an index to what they are elsewhere, away from Sydney. The prices of fresh meat fluctuate with the seasons, of course, but one is safe in saying that they are only from a quarter to a third what they are in the United Kingdom. The price of bread also fluctuates, but is somewhere about 3d. for the 2-lb. loaf :—

Arrowroot.....	4½d. per lb.	Maize meal	3d. per lb.
Acid (tartaric)	1s. 9d. per lb.	Matches (safety)	3½ per doz
Blue (square)	8d. per lb.	Mustard (Keen's)	1s. 9d. per lb.
Blacking (paste, small)	5½d. per doz.	Oatmeal	1s. 6d. per 7-lb. bag.
Bacon	9d. per lb.	Oats (rolled)	1s. 2d. per 5-lb. bag.
Baking-powder	1s. per lb.	Peas (split)	3d. per lb.
Barley (pearl)	3d. per lb.	Pease-meal	5½d. per lb. pkt.
Candles (sperm)	7d. per lb.	Pepper (black)	9½d. per lb.
Carbonate of soda	2½ per lb.	Pepper (white)	1s. per lb.
Cheese	9d. per lb.	Pickles	7½d. per bottle.
Cocoa	1s. 5d. per lb.	Rice	3d. per lb.
Coffee	1s. 6d. per lb.	Raisins	6½d. per lb.
Cornflour	4½d. per lb.	Sago	3d. per lb.
Cream of Tartar	1s. per lb.	Salt (table)	1d. per lb.
Currants	5d. per lb.	Soap (common)	5d. per bar (44 to cwt.)
Flour (200-lb. sacks)	17s 6d. per sack.	Soda (crystals)	1d. per lb.
Flour (50-lb. bags)	4s. 6d. each.	Starch	5½d. per lb. pkt.
Golden syrup.....	6d. per 2-lb. tin.	Sugar (white)	2½d. per lb.
Hams	10½d. per lb.	Tea	1s. 3d. per lb
Jams (1-lb. tins)	5d.	Tapioca	3d. per lb
Jams (2-lb. tins)	8½d.	Treacle	6d. per 2-lb. tin
Kerosene (4½-gal. tins)	5s.		

Drastic legislation against the influx of Chinese has had the effect of **The Birth-places** practically stopping their immigration, and since those already here are **of the People.** gradually leaving to lay their bones in the Flowery Land, the race is diminishing fast in numbers. Similar legislation has now been applied to restrict the immigration of other alien and inferior races. But the great need of the State is a stream of desirable immigrants—more people to cultivate the land and develop its resources.

The aborigines in 1901 numbered only 4,287 full-blooded blacks and half-castes, who were members of wandering tribes. 3,147 half-castes were living in comparative civilisation. The aborigines have entirely disappeared from large tracts of the State, and in the larger towns are rarely seen. They are not an element of the population that calls for further consideration here. The immigrant will naturally attach importance to the nationality of the people he is to come amongst. The following figures



NEAR THE SUMMIT OF MT. KOSCIUSKO.

illustrating the percentages of the birth-places of the inhabitants of New South Wales are taken from Coghlan, 1901 :—

New South Wales..	..	..	..	..	..	72·20
Other Australian States and New Zealand	..	..				8·32
English	..	..	..	..	..	9·32
Irish	..	..	..	..	..	4·43
Scotch	..	..	..	..	..	2·27
Welsh	..	..	..	..	..	0·26
Other British subjects	..	..	..	..	..	0·44
Total British subjects						97·24
Chinese	..	..	..	..	..	0·74
German	..	..	..	..	..	0·64
Other foreigners	..	..	..	..	..	1·23
Total foreigners						2·61
Born at sea						0·15
						100·00

Public safety is as complete in New South Wales as it is in any part of the world—there is no lawlessness anywhere, and the people are loyal to the British Crown and Empire. Settlers in possession of revolvers would be wise to leave them behind. The due observance of Sunday as a day of rest is universal, and public holidays are comparatively numerous. Social life is an important factor from the health standpoint, and is certainly more enjoyable among the labouring and middle-class families in New South Wales than it is with the corresponding classes in the Old Country. The weather is so “settled” generally, that one is fairly well able to judge what it is going to be in the immediate future—thus it is not usual for men to carry umbrellas, and it is possible to fix dates for picnics and outings of various kinds with a high degree of probability that adverse weather will not interfere.



BOTANY BAY.

There are good schools, churches of every denomination, libraries, schools of art, &c., &c., scattered all over the State, and the general habits of the people, with the sunny skies and beautiful moonlight nights, all help to make life more joyous. Without trying to account for it, that abject misery and wretchedness so common in the United Kingdom simply does not exist in Australia. Coghlan writes, “In Australasia the proportion of women and children engaged in laborious occupations is far smaller than in Europe and America, and the hours of labour of all persons are also less.” What this means for the happiness of the people is manifest.

It may be good news for females to learn that there is a great excess of males in the population, there being about fifty-two males to forty-eight females. The disproportion is, however, gradually disappearing.

Owing to the genial climate, we live out of doors much more than is possible
Out-door Life. in the United Kingdom, and the windows and doors of houses are generally, even at night, left more or less open. Most houses have verandahs in which much of the life goes on. Owing to the climate, outdoor exercise is freely indulged in. Cricket, football, and cycling are everywhere, and golf is spreading marvellously. Boating and bathing are common owing to the numerous harbours and long coast line. Riding is very common, of course, for horses are good and cheap, so that the postman brings your letters, the butcher-boy your pound of chops for dinner, on horseback—the lamplighter goes round to light his lamps on horseback.

There is no disease peculiar to New South Wales, and health legislation
Diseases. and administration are now very complete throughout the land—even in the sparsely-populated districts. This, with the natural salubrity of the country already referred to, makes the expectation of life greater in New South Wales than in the United Kingdom and most other countries. Still it must sorrowfully be confessed that people die even in New South Wales, though a glance at any table of the causes of death in New South Wales, such as that given by the Government Statistician, shows that they are just such as one might find in average European countries. The first ten causes are in their order :—Consumption, old-age, inflammation of the bowels, accidents, heart disease, inflammation of the lungs,



TUMUT RIVER.

cancer, mal-development of infants, premature birth, bronchitis, and so the list goes on with maladies that are familiar enough to everyone. Rickets is almost unknown. Diseases of the

chest are much less fatal than in older lands. Rheumatic fever and many forms of heart disease are less severe in New South Wales than in Europe.



ENGLISH BREEDS.

Malaria does not arise in New South Wales; if present, it has been introduced from other parts. There is no small-pox in Australasia, the only outbreaks being when it has been introduced by oversea ships. In every State, however, vigorous measures have always, as yet, succeeded in stamping out

the disease. It is, therefore, not to be wondered at that, vaccination not being compulsory, few persons take the trouble to be themselves vaccinated, or to have their children vaccinated, except, perhaps, when there is a scare owing to some ship having brought the disease. Then there is a rush for vaccination, but so soon as the disease has been overcome at the quarantine station the desire for vaccination evaporates almost clean away. Asiatic cholera is another disease that has no existence in Australasia. It could only be introduced by ships, and our quarantine administration is here again our safeguard. Also, there is no yellow fever, and no typhus fever. So far as is known, hydrophobia has never been known in Australasia, even although the wild dog, or dingo, is probably an old inhabitant of the continent. Dogs are now subject to a prolonged quarantine—six months—and this, together with the long voyage, keeps us fairly safe.

Hydatids call for some comment, owing to so much having been said about the subject. In Coghlan's list of the causes of death for the year 1900, hydatids, with forty-one cases out of a total of 15,118 deaths, stands fifty-third on the list. In New South Wales, as a cause of death, it was in that year only one three-hundred-and-sixty-ninth of the whole, standing between deaths from rupture (hernia) and deaths of persons "found drowned." In 1904 it was sixty-third on the list and one three-hundred-and-thirteenth of the whole. This disease is to be expected in a country where sheep and dogs are so common, for the dog is the animal in which the egg-producing state of the tape-worm is mostly found. It is found in various countries of Europe, and reaches its maximum in Iceland, where one-thirtieth of the whole population is affected. Altogether it seems, to me, that too much has been said and written about hydatids in Australia. If only more care were taken as to the disposal of offal after slaughtering animals for food, as to the purity of the drinking water, as to the proper cleansing of raw vegetables, and as to association of man with dogs, the figure of this disease would doubtless dwindle away to insignificance. Like small-pox, bubonic plague has been introduced by shipping, but having been vigorously grappled with, it was speedily got under. It never got beyond the ports at which it was introduced.

Leprosy is present in New South Wales, but it is a disease mainly of the Chinese and other coloured races. Whenever a case is discovered it is immediately segregated in the Lazaret. So small, after all, is the number of cases, only an average of about one native of the State per annum having been affected since 1883, and so much is the disease confined to the non-white races, or to persons who have been in other parts of the world where the disease is prevalent, that one never really gives it a thought in New South Wales.

Sunstroke Sunstroke, heat-stroke, or insolation, is not common, and generally it is
and associated with careless exposure or debilitated state of the body. It is
Snake-bite. not an affection to be at all considered by an intending immigrant. I
 mention the matter specially, because there is an idea not uncommon in
 Europe, that New South Wales is a "hot country," and, therefore, like
 another "hot country" familiar to the Englishman—India—is subject to sunstroke. But



CIRCULAR QUAY, SYDNEY.

New South Wales is not a "hot country," like India, and in New South Wales one hears but little of sunstroke, and sees less. The number of cases in any year depends, of course, upon the kind of season. In 1894 it caused only one one-thousand-and-eleventh of the deaths, but in 1897 it caused one two-hundred-and-fiftieth, and this is the highest rate I have found. In 1904 it caused one six-hundred-and-ninetieth. Really, however, I think these figures are too high, for I am sure that many cases are returned as sun-

stroke and heat-stroke that are nothing of the sort. They are cases of people in a precarious condition from other causes altogether, and the heat, careless exposures, &c., were just "the last straw," so to speak, and, therefore, should not be credited with the death at all. But the Statistician can only deal with the certificates as they are sent in to the Registrars.

There is a natural dread of snakes which has greatly enhanced the danger of snake-bite, and which still more greatly increases the victim's distress. On an average, there are from four to five deaths in the year from snake-bite in the whole of the State of New South Wales—chiefly children and young persons. But further, a very complete review of all the cases which have occurred during the last fourteen years has just been made by Dr. Frank Tidswell, of the Board of Health in Sydney, and from this investigation it is clear that had the ligature been applied and other measures been taken as directed by the Board some of these cases would not have died. Altogether this matter need not occasion a second thought to the settler.

Whatever way you look at it, New South Wales is a healthy country. Compared with the death-rates of other countries, especially those of the Old World, the death-rate of New South Wales—10·13 per 1,000 of the population—is remarkably low. For instance, that of

France is $17\frac{1}{2}$, of the United Kingdom is about $18\frac{1}{2}$, of the German Empire $21\frac{1}{2}$, of Italy 22, and of Austria $25\frac{1}{2}$. In England and Wales fifteen out of every hundred children born die in their first year—in Australia only 10 so die. This favourable rate for

Death-rate. New South Wales is due to the salubrity of the climate, the absence of pestilences, the superior social conditions of the people—good, plentiful, and cheap food and clothing—and healthful occupations. These figures are the mean for the State, and even this mean is gradually falling owing to health legislation, and the greater attention which is being paid to sanitary precautions. If the figures for the country districts are taken they are even more favourable than the mean for the State, and “no more potent argument could be advanced as to the natural salubrity of the State than the statement of the death-rates, as recorded outside the walls of the metropolis.” Medical men are accessible now in even the remotest parts, and trained nurses are everywhere available. Women generally have no insuperable obstacles in getting obstetrical assistance even in the remotest parts. They often, at that time, come into the nearest settlement, where there is usually provision for such cases.

Public hospitals are numerous and good, and the private hospitals of
Hospitals. Sydney are among the best and the cheapest in the world. For the destitute much is done both by public and private beneficence. It is easy to obtain admission to public hospitals everywhere. Old-age pensions of 10s. per week are given to men and women, who reach the age of 65, who have been twenty-five years in the State, have been of good conduct, and have no private means. As a last resource for the lonely and destitute the Government asylums afford a more or less comfortable retreat.



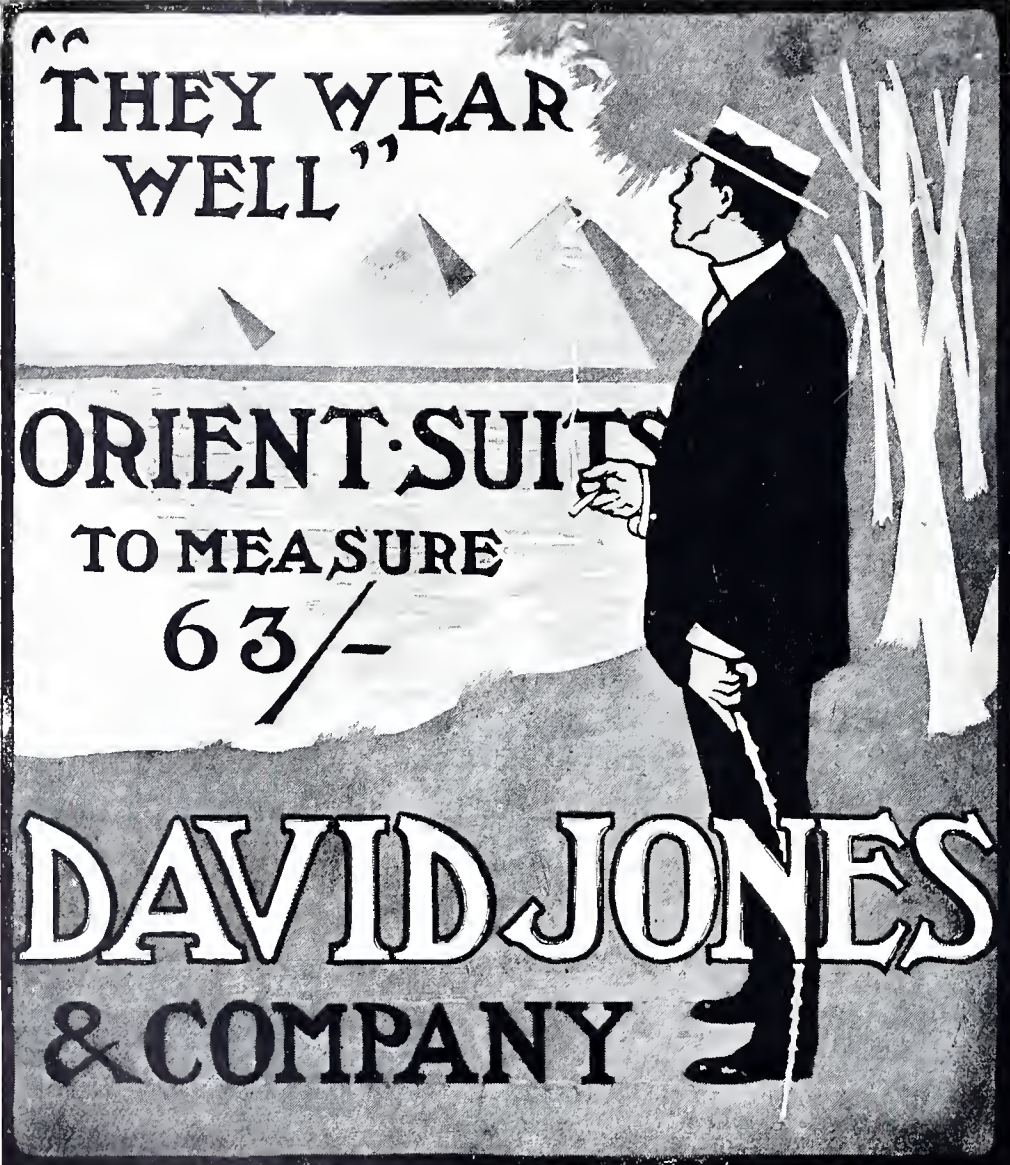


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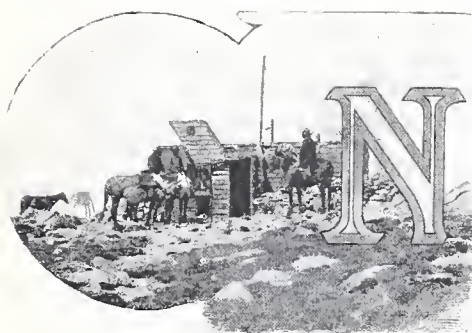
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OPPOSITE G.P.O. SYDNEY.

Climate.

BY H. A. HUNT, F.R. MET. SOC.,

ACTING GOVERNMENT METEOROLOGIST.



NEW South Wales may be divided up into four climatic areas:—Firstly, the coastal country; secondly, the tablelands; thirdly, the western slopes, all of which are suitable for agricultural pursuits; and fourthly, the great plains which are situated roughly to the west of the 147th meridian.

The north coast districts are favoured with a warm moist climate, liberally watered, the rainfall averaging from 40 to 70 inches annually, with occasional totals of 100 inches. The mean temperature for the year ranges from 66 to 69 degrees; it enjoys a summer temperature of from 75 to 78 degrees, and a winter of from 56 to 58 degrees. It is particularly suitable for subtropical growth, and is seldom subjected to excessive heat or winter frosts.

On the south coast the annual rainfall varies from 30 to 60 inches, and rarely falls short of 80 per cent. of the average. The mean temperature ranges from 57 degrees to 63 degrees for the year, with a summer average of from 67 degrees at the foot of the ranges to 70 degrees near the coast, and during the winter from 48 degrees to 64 degrees over the same area. This district is eminently adapted for dairying pursuits.

On the northern tablelands the rainfall is very consistent in quantity, falling away from a mean annual fall of 40 inches in the east to 30 in the western parts. The temperature is cool and bracing, ranging from 60 degrees to 54 degrees for the year, from 70 degrees to 65 degrees for the summer months, and from 44·7 degrees to 43 degrees during the winter. All agricultural and pastoral industries flourish in this part of the State, and, like the southern tablelands, it is eminently fitted for the breeding of high-class horses. The southern tableland is the coldest part of the State, the mean annual temperature being generally under 56 degrees, and at Kiandra, at an elevation little short of 5,000 feet, it is 44·5 degrees. During the summer months it ranges from 68 degrees to 57 degrees, and during the winter from 44 degrees to 34 degrees. This country, perhaps, produces a hardier breed of commercial stock than the northern tableland, and, like it, is largely used for agricultural and pastoral purposes. During periods when a scarcity of feed prevails in remote parts of the State, it is largely used for grazing stock removed from other districts, as feed is always there procurable.

The western slopes comprise the great wheat country of New South Wales, and cover approximately a belt of land of from 100 to 200 miles wide, stretching from the Queensland to the Victorian border. The annual rainfall is uniformly distributed over the entire area, and varies from 20 inches on its western limit to 30 inches on its eastern. The annual mean temperature ranges from 69 degrees in the north to 60 degrees in the south; during the summer from 81 degrees to 74 degrees, and in the winter from 53 degrees to 47 degrees.

At the present time the western plains are chiefly devoted to pastoral industries, *i.e.*, sheep and wool, but with the expansion of irrigation schemes and artesian bores enormous agricultural possibilities will be opened up. The soil is very rich, and the climate, although hot in the summer, is at all times exhilarating and healthy. The annual rainfall increases



MANLY, SYDNEY HARBOUR.

from 8 inches on the western border to 10 and 15 inches along the Darling, and then to 20 inches along its eastern limits. The annual temperature ranges from 69 degrees in the north to 62 degrees in the south, the summer from 83 degrees to 74 degrees, and the winter from 53 degrees to 45 degrees.

Occasionally during the summer months the temperature in most parts of the State may be uncomfortably hot, but it is generally tempered after sundown by cool breezes from the sea over the coastal regions, by mountain and valley winds on the highlands and slopes, and by nocturnal radiation on the plains.

The sun raises, chiefly in the tropical regions, a given quantity of water every twelve months; and, since there is no appreciable variation in the sun's heat from year to year, it is reasonable to assume that an equal amount of moisture is evaporated and condensed as moisture

every year on the face of the globe. This moisture is vagariously distributed throughout the world. Sometimes through the agency of the winds an undue amount is precipitated to the north of the equator, sometimes to the south. The horizontal direction is given to the winds by the revolution of the planet. The opposing direction is given to the winds by the difference in temperature existing at the equator and poles. The hot, moisture-laden winds rising at the equator pass as upper strata currents to the Arctic and Antarctic Circles, while the Polar dry, cold, and heavy winds return to the equator as surface currents. It will thus be seen



TWEED RIVER SCENERY, NORTH COAST DISTRICT.

we have two main sources governing the general circulation of winds which are acting at right angles to one another. The part of the globe in which these opposing currents chiefly contend lies in the subtropical regions both north and south of the equator, with the result that vast circulation systems are formed, and which are technically known as cyclones and anti-cyclones. The anti-cyclones constitute the primaries, although their existence was not appreciated as early as that of the cyclones. The anti-cyclones represent bodies formed of a superabundance of atmosphere, and may be likened to mountains of air, and, being

elastic and acting in a measure as a fluid, they are constantly endeavouring to flatten their peaks in order to regain a state of equilibrium. The trend of the winds flows spirally outwards as they progress from the centre and gradually increase in force until, upon reaching the periphery of these vast revolving bodies, they attain the height of gales. Naturally the greatest velocity of wind is attained in flat or neutral zones of atmosphere, which, about Australia, lie both to the north and south of the continent, and, as a result of the rushing air, eddies or depressions are formed in these neutral zones, which gradually intensify or diminish with the varying height or pressure of the high or anti-cyclonic system producing them.

We have endeavoured to show how the moisture evaporated at the equator is distributed over the globe. From experience we have learned that this distribution is both erratic and uneven, and it is believed it ever will be so.

**External
Influence on
the Weather.**

Let us endeavour to reason it out. As a starting point, suppose a rigid cycle to have been discovered, which, by the way, would only be possible provided the atmosphere were for all time in perfect equilibrium. This equilibrium would be upset or partially disturbed by both internal and external influences. For instance, the recent unusual solar magnetic activity which disorganised the telegraphic service in France must have exercised a momentous influence also upon the atmosphere. Volcanic eruptions follow no cycle; as far as is known they may occur at any time. Now dust, both earthly and cosmic, play important functions in relation to rain; so that the sudden discharge of this element into the atmosphere might upset its normal state for a prolonged period and over a greater portion of the globe, for volcanic dust is known to have been suspended in the air for many months after notable eruptions, and to have been carried right round the world. The same disturbing effects apply to the absorption of an abnormal quantity of meteorites by the atmosphere. The liberation of Arctic and Antarctic ice floes would also be a disturbing element. Coming to simpler problems, we have seen how man has influenced climate. Take for example the fog of London, which is solely caused by the smoke particles discharged from a million chimneys attaching themselves to the water spherules already present, and visible as ordinary or white fog. Take again the many instances of climatic changes effected by afforestation or deforestation.

These remarks are purpose of showing and complications problem of weather forecasts. So that years to come we the seasons as they best of them by and feed of bountiful during the inevitable



GOVERNOR-GENERAL'S RESIDENCE, SYDNEY.

advanced for the the great difficulties underlying the cycles and seasonal possibly for many shall have to take occur, and make the conserving the water seasons for use droughty ones.



WOOL ON THE ROAD TO MARKET IN THE WEST.

**Our Rain
not unduly
uncertain.**

Let us not delude ourselves with the idea that our rain and climate are peculiarly uncertain. Let it be understood that they are not more so than those of other countries. In fact, if anything, they are too generous. Let us be more provident and less speculative. Food and water may be husbanded occasionally unnecessarily, but our history tells us that such provision is absolutely necessary. The superabundance of grass, herbage and water in good seasons, if conserved, will carry us over a succession of bad ones sooner or later, and although at times it may appear a waste of labour and money in so doing, consider the reserve of wealth we shall have stored away; and also remember that, should we not want the fodder ourselves, the vagaries of seasons in other parts of the world may make a lucrative opening for export. In climates such as those of Europe, parts of Asia, and North America, the harvesting of crops for fodder has to be undertaken every year, so that the stock may be kept alive during the winter months, when the ground is covered with snow, a season when the soil is resting and regaining its spent fertility. Let us look upon droughts as blessings rather than as drawbacks, as a wise provision of nature to enable the soil to accumulate by decomposition of matter and absorption from the air those properties which have been exhausted during a succession of bountiful seasons.

**Rainfall
evenly
distributed.**

We hear much said about the disparity of rainfall in New South Wales, but, as a matter of fact, it is very evenly distributed when compared with that of other countries. We have an annual average of from 40 to 60 inches on the coast, gradually tailing off to 8 or 9 inches with remarkable uniformity in the extreme west, and although the greater half falls during the first six months of the year, the average for the last six months is well represented, and is very little short of the more favoured period. Compared with American rainfalls, we find that on the Atlantic coast they frequently exceed 100 inches annually, while probably the smallest rainfalls in the world occur in South-eastern California and Western Arizona, in and near the valley of lower Colorado, and in the section known as the Mohara Desert, where the

annual rainfall amounts to less than three inches; Yuma, Arizona, only has 2·81 inches; Bishop's Creek, Inyo, County Cal., 2·02 inches; Indio San Diego, 1·92 inches; Mammoth Tank, 1·88 inches only; Camp Mohara, Arizona, 1·85 inches. These last two stations doubtless have the smallest known rainfall on the face of the globe. In Indio during the season 1884 to 1885, only 10 points were recorded for the year. Along the Pacific slopes statistics show a disparity in rainfalls of 12 inches at San Diego to 24 inches at San Francisco, and again to 105 inches at Neah Bay.



BIELSDOWN WATERFALL, NORTH COAST DISTRICT.

Coming to Europe we find that in parts of Spain a total as low as 6 inches has been recorded for the twelve months.

In Asia, Aden, during a four years' average, only had 2·36 inches. Leh, Ladakh, adjoining Thibet, has a mean of 2·62 inches. From these figures it will be seen that the rain is not unduly capricious in New South Wales, but we are, in contrast with other countries, decidedly blessed.

Physiographical features of a country, and the distribution of land and water, have an intimate bearing upon the climate of all lands, and where extreme features exist, there we look for extremes in the climatic elements; thus in North America devastating winter blizzards alternating with disastrous summer heat waves are but natural concomitants. The continent of Australia on the other hand is comparatively flat, the only conspicuous mountains being the range of moderate elevation running along the eastern littoral. It is ideal in shape, and its shores are broken to a minimum degree, which, in itself, is evidence

of the general peacefulness of the climatic elements. It is so geographically distributed, too, that the major portion of its area of 3,000,000 square miles of country is situated in temperate latitudes, neither intruding too closely into equatorial latitudes in its northern parts, nor approaching inconveniently close to the cold parallels, and withal New South Wales enjoys the happy geographical medium.

The Effect of The wind affects the good or bad results of a season to a considerable
Winds on the extent. The rainfalls may be good and above the average, but should they
Season. be followed by dry westerly winds the moisture is evaporated and carried
 away to sea, while without these hungry winds, and with moderate rains, should
 they fall opportunely, a season will be good ; hence it is necessary to protect

our crops and grasses and tanks. Let us make wells—and not what are essentially evaporating pans—for conserving water as much as possible from the winds, particularly those blowing from between S.W. and N.W., by a systematic planting of trees throughout the State, running in belts from N. to S.; and where forest country is about to be opened there should be a proviso that belts be left at least every half mile, running in the direction named. These will also afford shelter for cattle, and in dry seasons collect some fog moisture during droughty periods, which in treeless country is evaporated soon after sunrise without having benefited the soil in any way. By this agency, in India, during seasons

of drought, the grass growing under the shade of forests has often saved large numbers of cattle from death by starvation. The wholesale destruction of trees in India and other parts of the world has had the most deteriorating effects on the climates, so that on no account should our trees be unnecessarily destroyed.



BROUGHTON MILL CREEK, SOUTH COAST DISTRICT.

Trees act as Apart from the above important influences which they exercise, forests con-
Collectors of siderably reduce the mean temperature of the air, especially during the warmer
Moisture. portion of the year. They prevent the occurrence of high temperature by
 shading the ground, by increasing the surface from which radiation takes
 place, by the active radiating power of the leaves, and by the frequent
 production of fogs and clouds. They also increase the relative humidity, and decrease
 evaporation by checking the movement of the surface air. Furthermore they increase the
 amount of water in the soil, notwithstanding the large supply of water which they need



ON THE BRUNSWICK RIVER, NORTH COAST DISTRICT.

3011 PRINTER
N.S.W.

themselves, and act as regulators of the water flowing through the ground, and of the supply of water in brooks and streams.

The climate of New South Wales is extremely salubrious, and remarkably equable, when compared with other continental lands, or even our sister States. For if we take the temperatures and rainfalls of the Australian capitals as being representative of the climatic conditions of their respective States, we find that that of New South Wales in some or all respects shows to advantage.

**Climate
extremely
Salubrious.**

				Temperature.				Rainfall.
				Mean.	Extreme Maximum.	Extreme Minimum.	Range.	
								Inches.
Sydney	..	..	..	63·0	108·5	35·9	72·6	49·35
Melbourne	..	..	..	57·4	111·2	27·0	84·2	25·61
Adelaide	..	..	..	63·0	116·3	32·2	84·1	20·21
Brisbane	..	..	..	68·7	108·9	36·1	72·8	50·00
Perth	..	..	..	62·7	107·9	36·9	71·0	33·05

From the above tables it will be observed that, although Melbourne's mean annual temperature is nearly 6 degrees lower than Sydney's, it is subject to much greater extremes, for during the hot months the maximum has reached nearly 3 degrees higher than any record taken in Sydney. The minimum also has fallen 8·9 degrees below the lowest reading in Sydney. Melbourne's mean annual rainfall also shows a shortage of about 24 inches as compared with Sydney's.

The comparisons with Adelaide show even greater disparity, for although the mean temperatures are equal, the extremes have capped those of Sydney by 8 degrees in the hottest months, while the lowest is only two-tenths of a degree higher; the annual rainfall, too, falls short, when compared with Sydney, by nearly 30 inches.

The mean temperature at Brisbane is nearly 6 degrees higher than at Sydney, but in other comparisons the results are fairly uniform. The mean annual rainfall of Brisbane is equal to that of Sydney, but the climate is more humid and enervating. Perth's rainfall is less than Sydney's by fully 16 inches.

In taking the figures of the various capitals as a basis for comparison of the climate of the respective States, for the purpose of showing the more favourable conditions for settlement in New South Wales, we shall find, if these comparisons are extended to other continents, more especially to those in the northern hemisphere, that



DRUMMOYNE BRIDGE.

Australia as a whole is most generously treated by nature, mainly due to the fact that it is an island continent, and both equatorial heat and antarectic cold are tempered by the surrounding ocean.

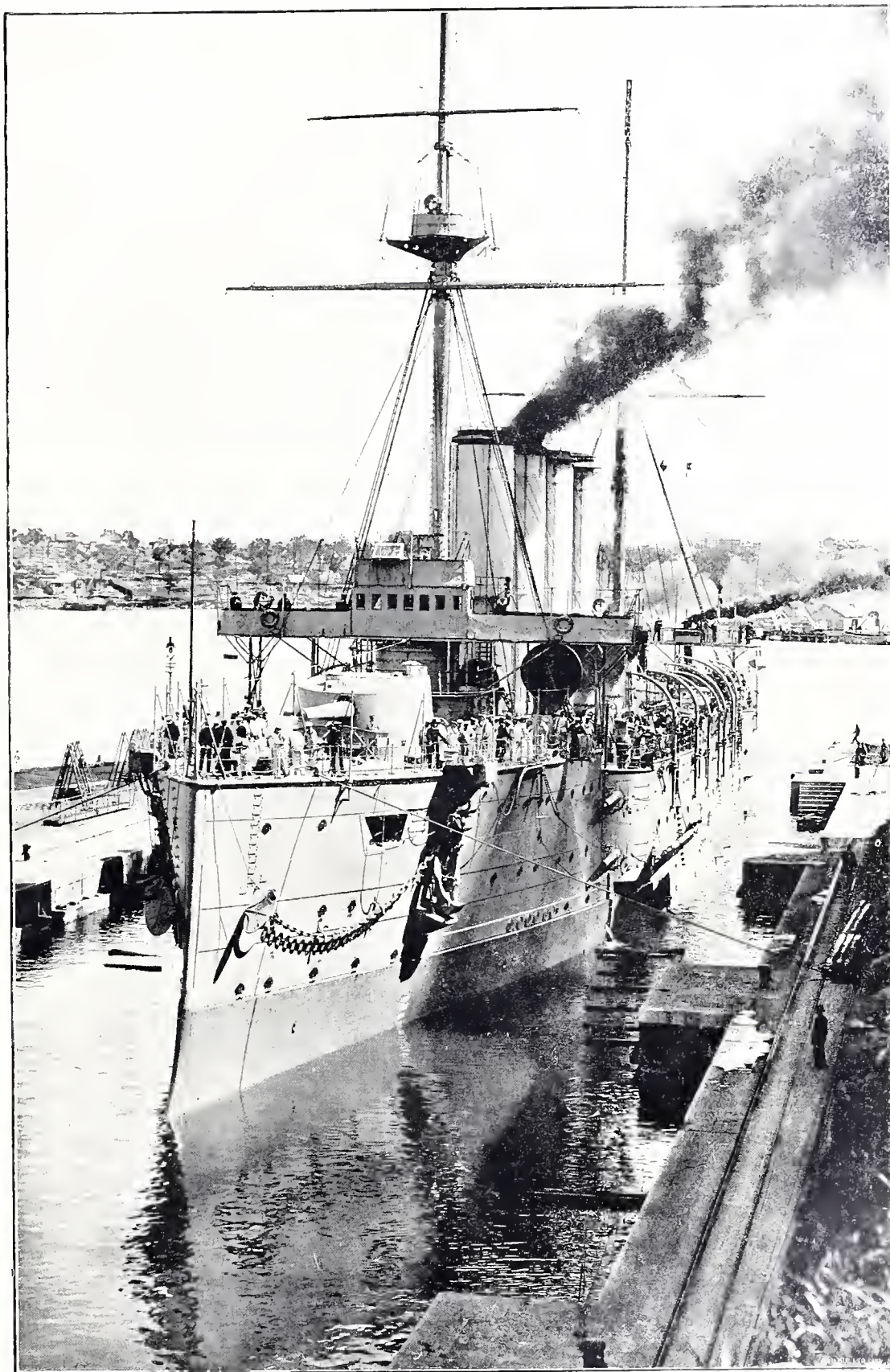
As the space is short, we shall confine our comparisons to the United States, for there we have an object lesson of what can be accomplished in spite of extreme vicissitudes of climate. We complain of a sudden drop in temperature of from 20 to 30 degrees in Sydney. What should we say were we subjected to the American experiences? The mean daily range on the Rocky Mountains and plateau regions is not less than 42·6. There are stories in Texas of 100 degrees being registered at noon, and of ice forming at night, and although the assertions may be exaggerated, they rest on a better foundation than many others less

startling. Amongst the most remarkable changes in twenty-four hours are the fall of 56·4 degrees at Fort Maginnis; 55 degrees at Helena; Deadwood, 55·3 degrees; Denver, 60·4 degrees; Lamar, 60·3 degrees, (58·5 degrees of it in nine hours); Abilene, Texas, 63·3 degrees in sixteen hours. The absolute ranges, that is, the difference between the highest summer heat and the lowest winter temperatures recorded, are equally pronounced and extraordinary. In Northern Montana the maximum has reached 110·8



COASTAL VIEW FROM BUSHRANGER'S HILL, NEWPORT.

degrees, and it has dropped as low as 63·1 degrees below zero—a difference of over 173 degrees. At New Haven, Connecticut, a difference of 114 degrees has been experienced; at Indianapolis, Indiana, 126 degrees; at Louisville, Kentucky, 124·5 degrees; at St. Vincent, Minnesota, 156·7 degrees; at St. Louis, Missouri, 127·9 degrees. These figures should be sufficient to show that ours indeed is a happy sunny land. Comparisons of rainfalls in New South Wales with other lands have been treated on another page. In concluding the notes on American heat, it is noteworthy that prior to 1859 the number of annual visitations of heat waves on the Pacific coast was thirteen, but since then they have dropped to four. This decrease is attributed by American authorities to the vast quantity of land under irrigation, and to the resultant increase in vegetation, a fact that should be of particular service in the future treatment of our country.



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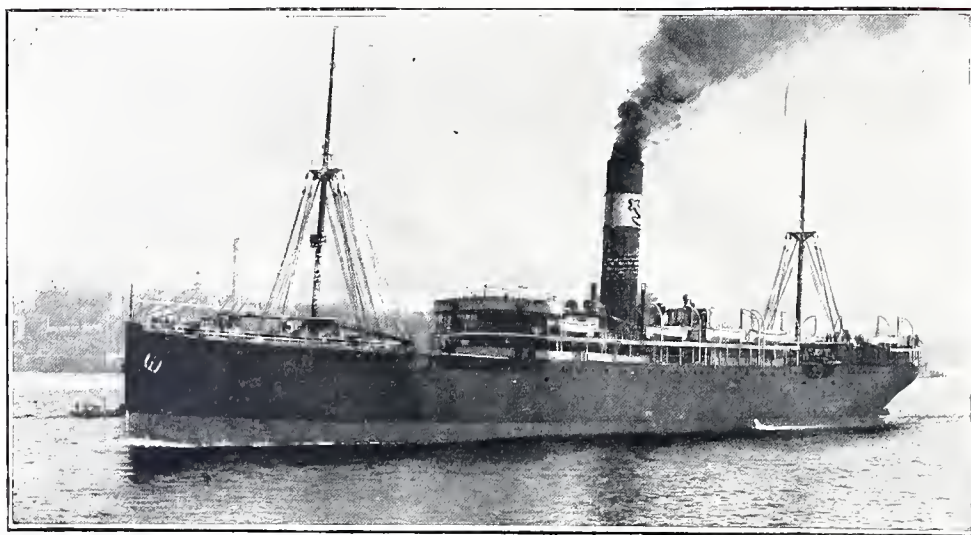
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Assisted Immigration.

Fares, Routes, and Regulations—Hints for Guidance of New Arrivals—Customs Duties—Cartage and Storage of Luggage—Accommodation—Postal Arrangements—Railway and Steamer Fares and Freights.

BY E. RAYMENT,

CHIEF CLERK, INTELLIGENCE DEPARTMENT.



THE Government of New South Wales has arranged to give assistance towards the passages of persons immigrating to New South Wales who intend to settle on the land or to engage in any form of rural industry, to domestic servants, or to any others who can satisfy the Agent-General in London, or the Director of the Intelligence Department in Sydney, that they will make suitable settlers, together with their wives and families, if any.

Nominations may be made in New South Wales for assisted passages for immigrants approved by the Agent-General, in accordance with the conditions set out in the "Regulations for Assisted Immigration" given hereunder.

Arrangements have been made with the Orient Royal Mail Line, the **Fares.** Aberdeen Line, Lund's Blue Anchor Line, and the Federal-Houlder-Shire

Lines for reductions in the ordinary rates for second and third class passages from Great Britain, and in addition to these reductions a Government contribution of £4 is made on each full fare and £2 on each half fare. Except in the case of nominated passages, the immigrants will be required to pay the full amount of the reduced fares quoted by the steamship companies, and the amount of the Government contribution will be refunded to them on landing in Sydney. In the case of nominated immigrants, when the passage money is paid in Sydney, the person making the nomination is required to pay the net amount only—that is, the reduced fares quoted by the shipping companies, less the amount of the Government contribution.

The rates for passages are as follows:—

Second Class—

Orient Royal Mail Line (only), ordinary fare*	£38
Reduced fare allowed by Company	32
Less Government contribution	4
Net fare to immigrant	£28

Third Class—

	ORIENT ROYAL MAIL LINE, ABERDEEN LINE, and LUND'S BLUE ANCHOR LINE.			FEDERAL-HOULDER-SHIRE LINES.		
	Berth in 2-berth Cabin.	Berth in 4-berth Cabin.	Berth in 8-berth Cabin.	Berth in 2-berth Cabin.	Berth in 4-berth Cabin.	Berth in 8-berth Cabin.
	£	£	£	£	£	£
Ordinary Fare*	20	18	16	18	16	14
Reduced Fare allowed by Company ...	16	15	14	15	14	12
Government Contribution	4	4	4	4	4	4
Net Fare to Immigrant	£12	£11	£10	£11	£10	£8

* The ordinary fare is quoted to show the reduction secured under assisted immigration.

Children. Children between 3 and 12 years of age, travelling with their parents, half price. One child under 3 years (no berth provided), free. If more than one child under 3, one-quarter fare each will be charged, exclusive of the one taken free.

Baggage. Second Class passengers are allowed 20 cubic feet and Third Class passengers 15 cubic feet of baggage, free of charge; children in proportion to fare paid. Excess luggage is charged 1s. 6d. per cubic foot.



A VIEW IN SYDNEY HARBOUR.

**Assisted
Immigrants
from United
Kingdom.**

Applicants for assisted passages from the United Kingdom to New South Wales can obtain full information from, and make all necessary arrangements with, the Agent-General for New South Wales, 125, Cannon-street, London, E.C. Before any assisted passage can be given, that officer will satisfy himself as to the eligibility of the applicant, in accordance with the physical, moral, and industrial conditions specified in the Regulations given hereunder.

(See Regulation No. 4, page 416.)

Persons immigrating to New South Wales from portions of the British **Immigrants from** Empire other than the United Kingdom, from Europe, and from the United **other countries.** States of America, will get the Government contribution towards their passages of £4 per head (children £2) on arrival in Sydney, provided they establish their *bona fides*, and prove to the satisfaction of the Director of the Intelligence Department, or any other officer appointed for the purpose, that they are strictly eligible in accordance with conditions specified in the Regulations given hereunder. (See Regulations 3, 4, and 5.) The final decision as to whether the assistance is to be given rests in every case with the Premier.



LONG COVE BRIDGE, SYDNEY HARBOUR.

Immigrants other than those from the United Kingdom must make their own arrangements with the shipping companies, and the full amount of the passage money will require to be paid when the passages are booked. It is probable that any reduction in the fares that may be made by any shipping company will be in the form of a rebate payable in Sydney, should the immigrant be found eligible to receive the Government contribution.

**Nominated
Passages.**

Persons domiciled in New South Wales, who wish to nominate their relatives for assisted passages to New South Wales, should communicate with the Director, Intelligence Department, Phillip and Bridge streets, Sydney. Provided the cases comply with the conditions laid down in Regulations 4 and 6, and an undertaking is given by the nominator that employment will be found for the immigrants on arrival, or that adequate provision will be made for their maintenance, on the approval of the Premier being obtained, a certificate will be issued on payment of the net amount of the passage money, entitling the immigrants to passages to Sydney. This certificate is to be forwarded to the persons nominated, and, on presentation to the Agent-General, that officer, if satisfied as to the eligibility of the nominees, will arrange for the passages. A receipt will also be issued to the nominator by the Intelligence Department, undertaking to refund the amount deposited in the event of the passages being refused by the Agent-General for any reason.

Where it can be proved to the satisfaction of the Intelligence Department that the full amount of the passage money cannot be paid immediately, a passage certificate may be issued

on the payment of not less than one-third of the amount required, if an undertaking be given to pay the balance by instalments within twelve months, and a responsible guarantor be provided who will undertake to pay the amount in the event of default on the part of the nominator. This concession will only be allowed in very special cases, and will be subject to approval by the Premier. In cases where such a course appears desirable no objection is made to issuing a certificate on the payment by the nominator of a portion—say one-third—of the amount required, on the understanding that the balance is to be paid to the Agent-General by the nominee. The granting of the passage would in that case, of course, be contingent on the payment of the balance.

Nominations may be made in New South Wales in the case of relatives in portions of the British Empire other than the United Kingdom, in Europe, or in the United States of America ; but in such cases the full amount of the passage money must be paid by the nominator, and a refund of the Government contribution will be made to the nominator in the case of each immigrant found, on arrival, to be eligible in terms of the Regulations.



ORIENT ROYAL MAIL LINE—THIRD-CLASS DINING-ROOM.

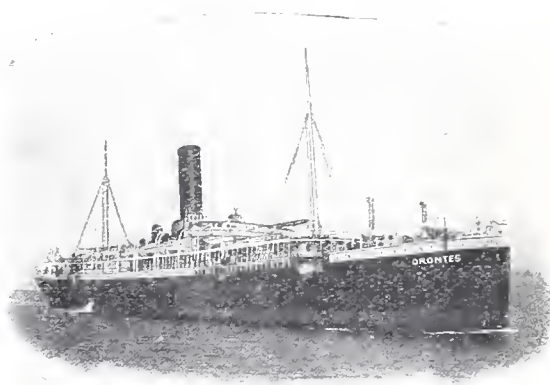
Immigrants, whose coming is advised, will be met on arrival by an officer of the Intelligence Department, and suitable accommodation at reasonable rates will be recommended to them. In most cases, arrangements can be made with the shipping companies for the immigrants to remain on board for not more than three days after arrival in port without extra charge. Nominated immigrants will not be met by the Immigration Officer, unless a request is sent to the Intelligence Department, as it is presumed that they will be met on arrival by their relatives who nominated them.

All persons arriving in the State who desire to procure land for settlement, or to obtain employment in agricultural or pastoral pursuits, are advised to communicate at once with the Intelligence Department, where every advice and assistance will be rendered to them free of charge, and they will be brought into touch with lands available for settlement, or places where suitable employment may be obtained, as the case may be.

PARTICULARS OF SHIPPING ROUTES AND ACCOMMODATION.

Orient Royal Mail Line. This is the quickest service between England and New South Wales, the voyage occupying forty-two days. A regular fortnightly service is maintained, the steamers leaving London and Plymouth every alternate Friday and Saturday, respectively. Owing to the fact that the Orient Royal Mail Line has a contract for the carriage of mails, the regularity of despatch and the maintenance of the specified time-table are assured. The second-class accommodation on these steamers is of the highest order, and every comfort is provided for. In the third-class there are commodious dining saloons, and stewards and stewardesses are carried. The steamers are fitted throughout with electric light, also with refrigerating machinery, thereby ensuring fresh provisions throughout the voyage. All table and cabin requisites, such as bedding, linen, &c., are supplied, so that passengers have only to provide their own personal effects. A doctor is carried, and in the case of sickness his services are available free of charge.

The route traversed by this line is very interesting. Between London and Sydney the ports of call are Plymouth, Gibraltar, Marseilles, Naples, Port Said, Suez, Colombo, Fremantle, Adelaide, and Melbourne. At most of these ports sufficient time is allowed for passengers to inspect the various scenes of beauty and interest. Further particulars may be obtained from Messrs. Anderson, Anderson, & Co., Fenchurch Avenue, London, or Orient Royal Mail Line, 12, Martin-place, Sydney.



ORIENT ROYAL MAIL LINER "ORONTES"—9,023 TONS.

The The steamers of this line travel *via* South Africa ; the passengers are never
Aberdeen Line. subjected to extremes of temperature ; and the time of journey is forty-six



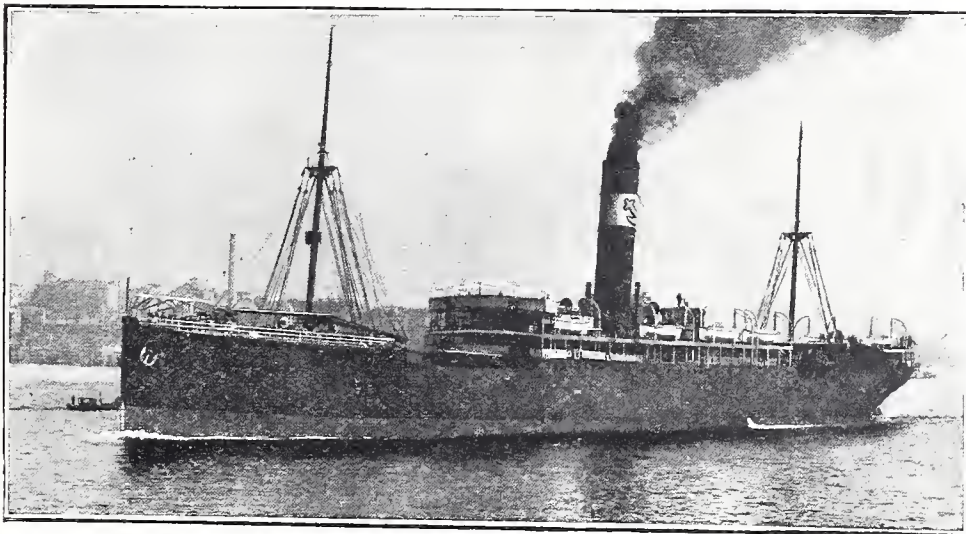
ABERDEEN LINE—THIRD-CLASS 4-BERTH CABIN.

to fifty days. Departures from London are at regular three-weekly intervals, in accordance with time-table printed for the whole year, which is strictly adhered to. The accommodation is for first and third class passengers, and the cabins for the latter, which are either on the upper deck or 'tween decks, are lofty and well lighted. Passengers are not required to provide anything in the way of bedding, table or cabin appointments, which are provided by the Line on a very comfortable scale. As with all the most modern vessels, refrigerator chambers guarantee fresh provisions throughout the voyage, while the general rooms and cabins are lighted throughout with electric light. A full staff of stewards and stewardesses attend to passengers' comfort, while in the event of sickness, the ship's medical officer attends free of charge, medicines being supplied free, as may be necessary. The ports of call between London and Sydney are Plymouth, Tenerife, Cape Town, and Melbourne.

Further particulars are obtainable from Messrs. George Thompson & Co., Ltd., 7, Billiter Square, London, E.C., or Messrs. Dalgety & Co., Ltd., 15, Bent-street, Sydney.

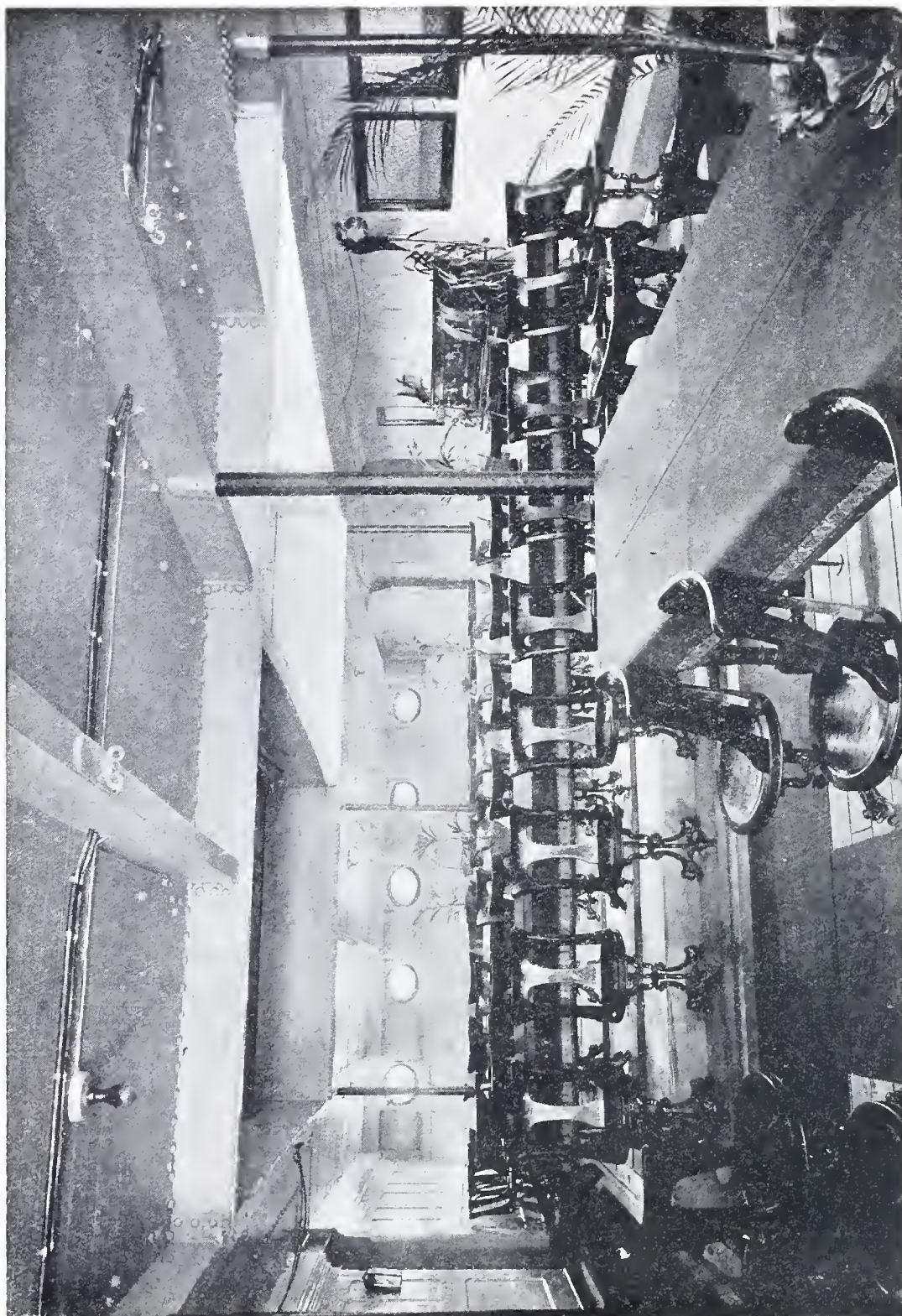
**Lund's
Blue Anchor
Line.** These steamers also come *via* the Cape, the journey occupying from forty-six to fifty days. They run to a regular time-table, leaving London every month. They carry first and third class passengers, but there is no second class. The third-class accommodation is all on the main and upper decks.

The cabins are roomy and airy, and fitted with electric light and other improvements. There are dining and reading rooms, and a piano is provided, and some of



LUND'S BLUE ANCHOR LINER "GEELONG."

the steamers have a ladies' room and a smoking-room. Every cabin and table requisite, such as bedding, linen, cutlery, &c., is found by the ships, so that passengers do not need to provide themselves with anything of this sort. Stewards, stewardesses, and a doctor are carried, and medical attendance and medicines are provided free. Materials for deck games are also provided by the Company for the use of passengers. The ships are all fitted with refrigerating



LUND'S BLUE ANCHOR LINE—THIRD-CLASS DINING SALOON.

chambers for the carriage of fresh provisions, &c. The ports of call between London and Sydney are Canary Islands (optional), Cape Town, Adelaide, and Melbourne. With the exception of about seven days when passing through the tropics, the voyage is in a temperate climate. Further particulars may be had on application to W. Lund and Sons, 3, East India Avenue, London, E.C., or to Gilchrist, Watt, and Sanderson, Ltd., 7, Bent-street, Sydney.

The steamers of these lines, which travel *via* the Cape, being primarily cargo vessels, do not run to any set time-table, and are not strictly limited as to the time of journey, which generally takes from forty-six to sixty-six days. The steamers, however, sail at fairly regular intervals (about once a month), starting from Liverpool. Passengers coming from London will have their railway fares to Liverpool paid by the Company. The accommodation naturally varies on the different steamers of the three lines forming this combine, but may be generally recommended to those intending immigrants to whom the somewhat lower fares will be a consideration. Stewards, stewardesses, and a doctor are carried, and the dietary scale is satisfactory, fresh provisions being rendered possible by the refrigerating system, now so universal. Full information may be obtained on application to the Federal Steam Navigation Company, Limited, 2, Fenchurch Avenue, London, E.C.; Houlder Bros. & Co., Limited, 146, Leadenhall-street, London, E.C.; and Turnbull, Martin, & Co., 112, Fenchurch-street, London, E.C.; or in Sydney to Messrs. Birt & Co., Limited, 7, Macquarie-place, and Houlder Bros. & Co., Limited, Exchange Corner.

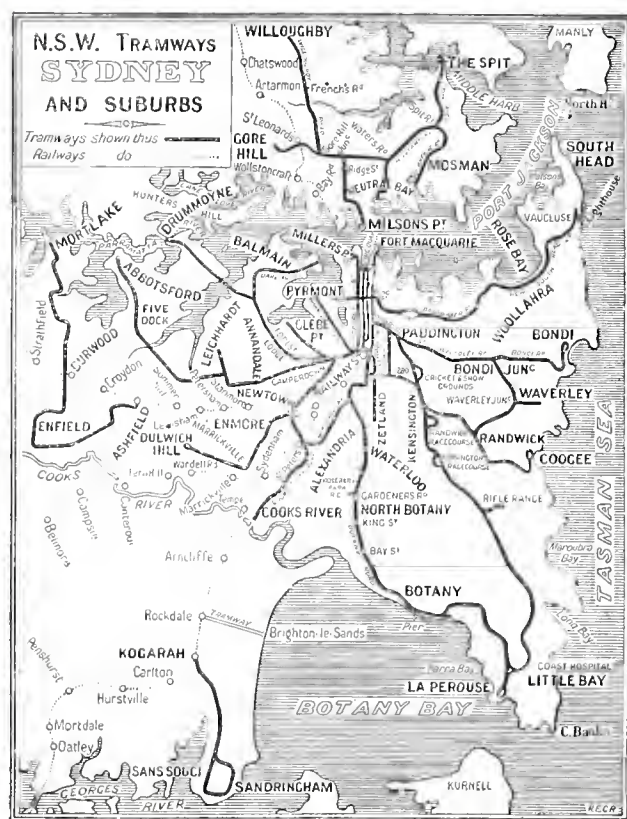


ON THE BEACH AT TWEED HEADS.

HINTS FOR THE GUIDANCE OF NEW ARRIVALS.

Oversea passengers to New South Wales all disembark at Sydney, the capital of the State and the leading city of the Commonwealth. With a population of over half a million, it ranks as one of the six largest cities in the British Empire. Picturesquely situated on the shores of Port Jackson, which is claimed, and with justice, to be one of the most beautiful harbours in the world, Sydney is in every respect an up-to-date city. A most complete and efficient system of electric trams traverses the main streets, and brings all the suburbs within easy reach, as well as serves to feed the fine Central Railway Station recently open for traffic. The tram fares are probably the cheapest in the world, and the various routes are split up into penny sections, the fare for any journey within the city being one penny. The streets and most of the public and private buildings are lighted by electricity, which is supplied by the City Council, though many prefer to retain the gas. The water supply is never-failing and beautifully pure; and the sanitary arrangements are all that can be desired.

Although a Customs tariff is in force in the Commonwealth, no difficulty need be feared regarding the passing of entries and satisfying Customs Officers. Every consideration is given, and no pains are spared to make things easy and prevent inconvenience to passengers. All assisted immigrants are met by an officer of the Intelligence Department, who will make all necessary arrangements. "Passengers' personal effects" are exempt from any Customs duty, and include all wearing apparel and all articles of personal adornment or use *bona fide* the property of the passenger and not for sale, and (e.g.) bicycles, saddles, firearms, camp equipment for sportsmen, &c., can be admitted under this heading. In addition to such articles coming under the heading of "personal effects," "passengers' furniture and household goods" are admitted duty free to the extent of £50 per adult passenger, calculated on the second-hand value of the articles. As an example, a man with his wife and, say, six children, of whom three were adults, would be allowed to bring in £250 of furniture, &c. (second-hand value), free of duty. Under this heading are included all articles ordinarily used in the



household, such as books, pictures, plate, pianos, organs, &c. A stipulation is made that such furniture and household goods must have been in actual use by passenger for at least one year immediately prior to shipment. A liberal view is taken by the Customs officials as to what is covered by the above-mentioned exemptions. Further, if the goods arrive within three months (or six months under special circumstances) before or after the passenger to whom they belong, they are given the benefit of the exemption as if they had arrived with the passenger.

The shipping companies will usually store an immigrant's luggage, free of charge, for a day or two, but only at passenger's risk.

There are, however, numerous places in town where storage may be had at reasonable charges, viz., about 3d. per box, trunk, &c., per week, taking the responsibility for any loss or damage while stored. Recognised carriers meet the steamers and make all arrangements for carting and storing the luggage. For the carting, specially cheap rates are charged—from 1s. per head upwards, according to amount of luggage. Immigrants should always consult the Immigration Officer in regard to these matters, in order that the cheapest arrangements may be made. It is seldom necessary for them to hire a van in the ordinary way, the charges for which are as follow:—For any time not exceeding half an hour, 2s.; for every extra half-hour or fraction, 1s. 3d. Special rates for long times or distances.

Cab fares.—One shilling per quarter-hour up to one hour, and nine-pence per quarter-hour beyond first hour. This is for two adults and 50 lb. of luggage, or one adult and 100 lb. of luggage. Extra charge is made between 10 p.m. and 6 a.m., and also when cab is discharged more than a certain distance from place where it was engaged.

No free lodgings are provided for immigrants. Sydney is well supplied with lodging-houses and boarding establishments, and the Immigration Officers advise where comfortable accommodation may be secured according to the wishes and means of the immigrant, pending departure for the country districts. Board and lodging may be obtained for single men from 12s. to 18s. per week. Superior accommodation can be had for 20s. to 25s. per week. Single women can obtain accommodation at such places as the Young Women's Christian Association from 10s. 6d. to 16s. per week. Married couples may find it better to secure lodgings at from 10s. per week upwards, and make their own arrangements for meals. Good meals are obtainable from 6d. upward.

Persons desiring high class accommodation will find that the leading hotels and boarding-houses leave nothing to be desired, and the tariffs are reasonable.



CAPTAIN COOK'S STATUE.

House rent varies, of course, according to situation, &c., but the following may be taken as the average for small places :—

Small cottages, Sydney and suburbs, three or four rooms and kitchen, 8s. to 12s. per week ; cottages or small houses, four or five rooms and kitchen, 12s. to 18s. per week ; larger houses in proportion. Rates and taxes are paid by landlord.

New South Wales has an excellent postal, telegraph, and telephone service, especially in the metropolitan and other settled areas. In the outlying and scattered districts of a country of such great distances, where the mails have in many cases to be carried by coach, the service is, of course, not so expeditious, but even there the regularity is unfailingly preserved. There is a weekly mail service with Great Britain (the mails taking about thirty days), and tri-weekly with America (time about twenty-one days). Mails close at the General Post Office for the United Kingdom at 5.30 p.m. every Tuesday, and the incoming mails are usually received at the beginning of the week.



Principal postage rates are as follow :—

Letters—

For every $\frac{1}{2}$ oz. or fraction thereof, City and suburbs, and within the postal boundaries	d.
of country towns	1
Remainder of State	2
Australasia and New Zealand	2
United Kingdom (N.B.—United Kingdom to Australia, 1d.)	2
All other places	2 $\frac{1}{2}$

Post Cards—

Australia, &c. (reply cards double)	1
All other places do do	1 $\frac{1}{2}$

Letter Cards—

Australia, &c.	1 $\frac{1}{2}$
United Kingdom	2
All other places	2 $\frac{1}{2}$

Commercial Papers—

Australia, &c., every 2 oz. or fraction thereof	1
All other places, 2 oz. do	3
4 oz. do	3 $\frac{1}{2}$
and so on.	

Printed Matter—

New South Wales, 2 oz. or fraction thereof	0 $\frac{1}{2}$
Do 4 oz., and each additional 4 oz.	1
All other places, 2 oz. or fraction thereof	1

Parcels—

Australia, &c., 1 lb. 8d., each additional lb. 6d. extra.
All other places, special rates.

Newspapers—

Australia, &c., 10 oz. or fraction thereof	...	...	...	...	...	...	...	d.
All other places, 4 oz.	do	...	...	...	...	...	...	0½
								1

Telegrams—

	Metropolitan and within 15 miles.	Inland.	Interstate.
Not exceeding 16 words	6d.	9d.	1s.
Each additional word	1d.	1d.	1d.

Money Orders—

Commission up to £5, 6d.	{ N.S.W. Outside State slightly higher.
Do £10, 1s.	

Postal Notes—

Poundage up to 1s. 6d., ½d. ; 4s. 6d., 1d. ; 5s., 1½d. ; 7s. 6d., 2d. ; 20s., 3d.

Full particulars in regard to any of these matters are obtainable from any Postmaster in the State, or from Intelligence Department.

Chapter IX deals with railway communication generally, but the following hints will no doubt be of interest. To give an idea of the cost of travelling the following fares and rates are quoted, and from these an approximate idea may be obtained as to the charges generally :—

Sydney to—	Miles from Sydney.	Single.		Return.		Holiday Excursion.	
		1st Class.	2nd Class.	1st Class.	2nd Class.	1st Class.	2nd Class.
		s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Bathurst	145	28 9	19 3	43 0	28 9	38 3	25 9
Tamworth	282	48 0	31 9	73 6	48 3	67 6	44 3
Wagga Wagga	314	59 0	40 0	88 9	60 0	79 0	53 3
Inverell	509	84 3	56 6	126 6	85 0	112 6	75 6

First-class passengers are allowed to take 112 lb. and second-class passengers 84 lb. *bona fide* passengers' luggage with them free of charge. In the case of immigrants travelling second class, who present a certificate from the Director of the Intelligence Department, luggage to the extent of 168 lb. may be taken free of charge. Excess luggage will be charged at parcels rates, which are as follow :—

STAMPED Parcels (Prepaid) Rates.

Miles.	Not exceeding—				Each additional 28 lb. or part thereof.
	3 lb.	28 lb.	70 lb.	112 lb.	
	s. d.	s. d.	s. d.	s. d.	s. d.
1 to 22	0 3	0 6	1 3	1 6	0 6
23 to 50	0 6	1 6	3 9	6 0	1 6
51 to 100	1 6	4 0	8 6	13 0	3 3
Over 100	2 0	4 6	9 9	15 0	3 9

Where passengers have much luggage in excess of that allowed, it is advisable to have a portion sent to their destination separately by goods train, examples of the rates by which are as follow :—

			1 cwt.		5 cwt.		1 ton.
			s. d.		s. d.		£ s. d.
100 miles	...	...	2 9	.....	13 9	.....	2 14 10
200 „	...	...	5 0	.....	25 2	.....	5 0 8
300 „	...	...	6 7	.....	33 0	.....	6 11 11
400 „	...	...	7 3	.....	36 1	.....	7 4 5
500 „	...	...	8 0	.....	40 1	.....	8 0 8

Where parties are travelling together, compartments may be reserved (except on public holidays) on production of six full fare 1st class, or eight full fare 2nd class tickets, and due notice being given.

Sleeping berths may be obtained on payment of 12s. 6d. in addition to 1st class ordinary or holiday excursion fares.

The following rates are quoted to show the freights charged on produce sent to market :—

<i>Wool—to Sydney—</i>				Undumped, Scoured, per ton.	Greasy, per ton.
Bathurst (145 miles)...	...	...	...	£2 2 7	£1 16 6
Tamworth (282 „ )...	...	...	...	3 3 2	2 16 11
Wagga (314 „ )...	...	...	...	3 5 8	2 19 3
Inverell (509 „ )...	...	...	...	3 15 5	3 9 2

Grain, Flour, Vegetables, and other Agricultural Produce—To Sydney or Newcastle—

50 miles	5s. 0d. per ton	} In 6-ton truck load.
100 „	...	...	...	8s. 4d. „
250 „	...	...	...	12s. 2d. „
500 „	...	...	...	14s. 2d. „

Hay, Straw, Chaff, &c.—

50 miles	£1 4 0	} Per truck load not exceeding 6 tons.
100 „	...	...	...	1 14 0
250 „	...	...	...	2 17 0
500 „	...	...	...	3 16 0

Butter, Milk, Fruit, Vegetables, other Dairy and Garden Produce—

50 miles	...	1s. 0d. per 60-lb. package	1s. 0d. per 140-lb. package.
100 „	...	1s. 0d. „ „	1s. 6d. „ „
300 „	...	1s. 6d. „ „	3s. 3d. „ „
500 „	...	2s. 0d. „ „	4s. 3d. „ „

Particulars of the concessions given to immigrants who have purchased land for settlement will be found in No. 11 of the Regulations for Assisted Immigration (see page 417). Certain concessions are also granted to Students at the Agricultural Colleges and Experiment Farms.

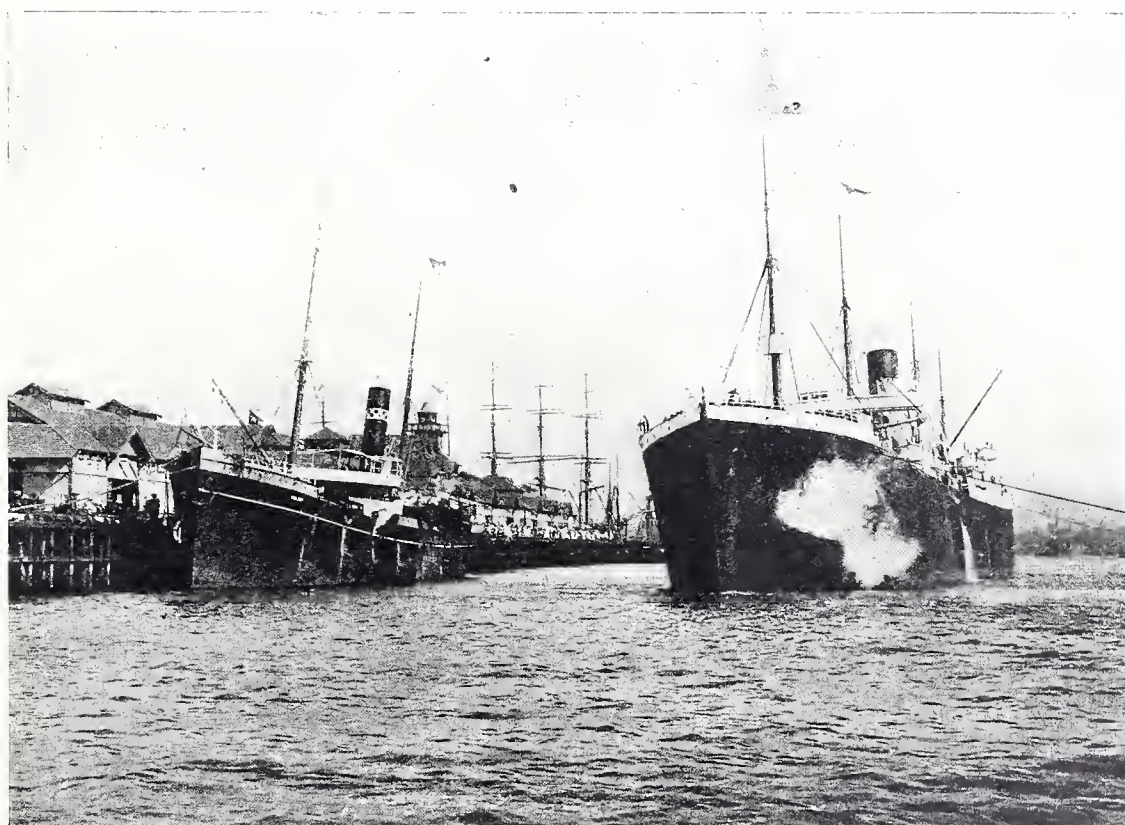
The North and South Coast districts, which are not connected with Sydney by rail, are well served with up-to date steamers. The two leading companies **Coastal Steamer Fares.** are the North Coast S.N. Co. and the Illawarra S.N. Co., and the following fares, which are subject to alteration, are quoted as examples of the rates charged :—

Ballina (Richmond River), 612 miles—Saloon, single, 30s. ; return, 45s.

Steerage, single, 12s. 6d. ; return, 25s.

Moruya (South Coast), 242 miles—Single, 12s. 6d. ; return, 20s.

All police officers throughout the country are instructed to give advice and assistance to immigrants should they require it. They may, therefore, **Assistance by Police.** consult those officers at any time when they are in difficulty or doubt. When necessary the police officer will forward the matter on to the Intelligence Department, or the immigrant may communicate direct with that Department in the full assurance that the officers will do everything in their power to advise and assist them.



A "WHITE STAR" LINER LEAVING SYDNEY HARBOUR FOR ENGLAND.

Intelligence Department,

Sydney, 4 April, 1906.

THE following Regulations governing Assisted Immigration to New South Wales have been approved by the Premier and Colonial Treasurer, and are published for information.

HENRY C. L. ANDERSON,

Director, Intelligence Department.

REGULATIONS FOR ASSISTED IMMIGRATION.

1. All assisted immigrants shall be selected by the Agent-General, or by such other persons as may be appointed for the purpose, under instructions from the Premier.

2. The selection of assisted immigrants shall be made mainly from the populations of England, Scotland, Ireland, and Wales, and in such manner that the numbers of immigrants accepted from each of these parts of the United Kingdom shall, at the close of each year's operations, be fairly proportionate to the respective populations of those parts, as shown to exist by the latest Census returns.

3. A proportion of the assisted immigrants may be drawn from other European countries and the United States of America, also Canada, South Africa, and other parts of the British Empire, provided they be eligible under the conditions laid down in these Regulations, and under the provisions of the "Immigration Restriction Acts, 1901-1905" (Federal).

4. All assisted immigrants must be of sound mental and bodily health and of good moral character, shall not exceed 50 years of age, and shall consist of persons skilled in any form of rural industry, domestic servants, and any others who can satisfy the Agent-General that they will make suitable settlers, together with the wives and families of the same, if any : Provided that the condition as to occupation shall not apply to immigrants nominated in terms of Regulations 6 and 10.

5. No adult male immigrant shall be eligible for assistance under these Regulations until he shall have given satisfactory proof that, upon landing in Sydney, he will be possessed of capital to the extent of at least £10 if he be a British subject or citizen of the United States of America, and to the extent of £25 if he be a citizen or subject of any other country. This Regulation shall not apply to immigrants nominated in terms of Regulations 6 and 10.

6. Nominations for assisted immigration may be made in the State in the following cases :—

- (a) Men domiciled in New South Wales who wish to bring out their wives and children, on satisfactory reports being obtained and approval by the Premier.
- (b) Persons domiciled in New South Wales who wish to bring out their parents from the Old Country, provided that the conditions of health and age are complied with.
- (c) Persons domiciled in New South Wales desiring to bring out near relations, other than those mentioned above, who may be approved in terms of these Regulations. In such cases it must be shown that employment is awaiting the immigrants nominated, or provision made for their maintenance, if without adequate means.

(d) Any settler already domiciled in New South Wales who desires to bring out the woman whom he proposes to marry.

7. Assistance towards fares of approved immigrants will be given by the Government of New South Wales to the extent of £4 for each adult, and £2 for each child between the ages of 3 and 12 years, provided that the steamship company in whose vessel such immigrant shall travel shall make a rebate, to be approved by the Premier, from the fare of each adult or child so assisted. The Government subsidy shall be made payable to the immigrant immediately upon arrival in Sydney.

8. Assisted immigrants shall be brought out in steamers approved by the Agent-General, or other person acting on behalf of the Government of New South Wales.

9. All arrangements and payments in connection with assisted immigrants, as between the Government of New South Wales and the steamship companies concerned, shall be made by the Agent-General in London, or by the Director of the Intelligence Department in Sydney.

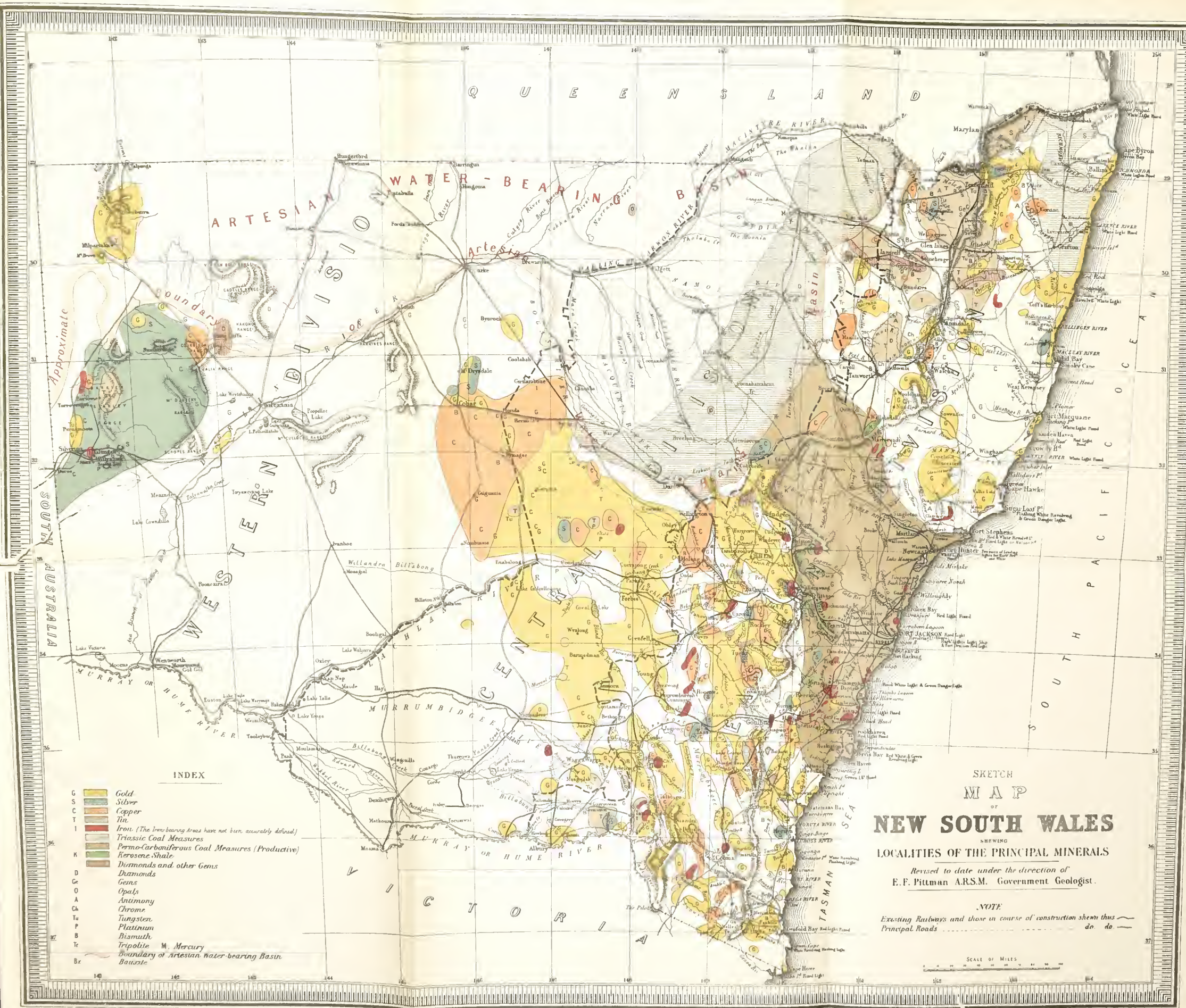
10. Any person domiciled in New South Wales who wishes to nominate a person for an assisted passage under Regulation 6 shall pay to the Director of the Intelligence Department in Sydney the net sum necessary to provide a passage for such nominated immigrant, or shall give a satisfactory guarantee for the payment of the same in monthly instalments within one year, and shall in any case give proof that such nominated immigrant shall be adequately provided for upon arrival. Upon such nomination being approved by the Premier, a passage certificate shall be issued to the applicant, which must be produced by the nominee within twelve months from the date thereof, to the Agent-General in London, or such other person as may be appointed by the Premier for this purpose. Before arranging to provide for the passage to New South Wales of any person who has been so nominated, the Agent-General shall satisfy himself that such person is eligible, and shall refuse to provide a passage if it shall, for any reason, appear to him that the person nominated is undesirable.

11. Any immigrant who shall have taken up land in New South Wales for *bona fide* agricultural settlement within a reasonable time of his arrival shall be entitled to a refund of one-half of the railway fare for himself and family when travelling to the district in which he shall have settled, to take possession, and also one-half of the railway freight charged on his household furniture, stock, and agricultural implements taken with him.





PIPE LINE SYDNEY WATER SUPPLY.



INDEX

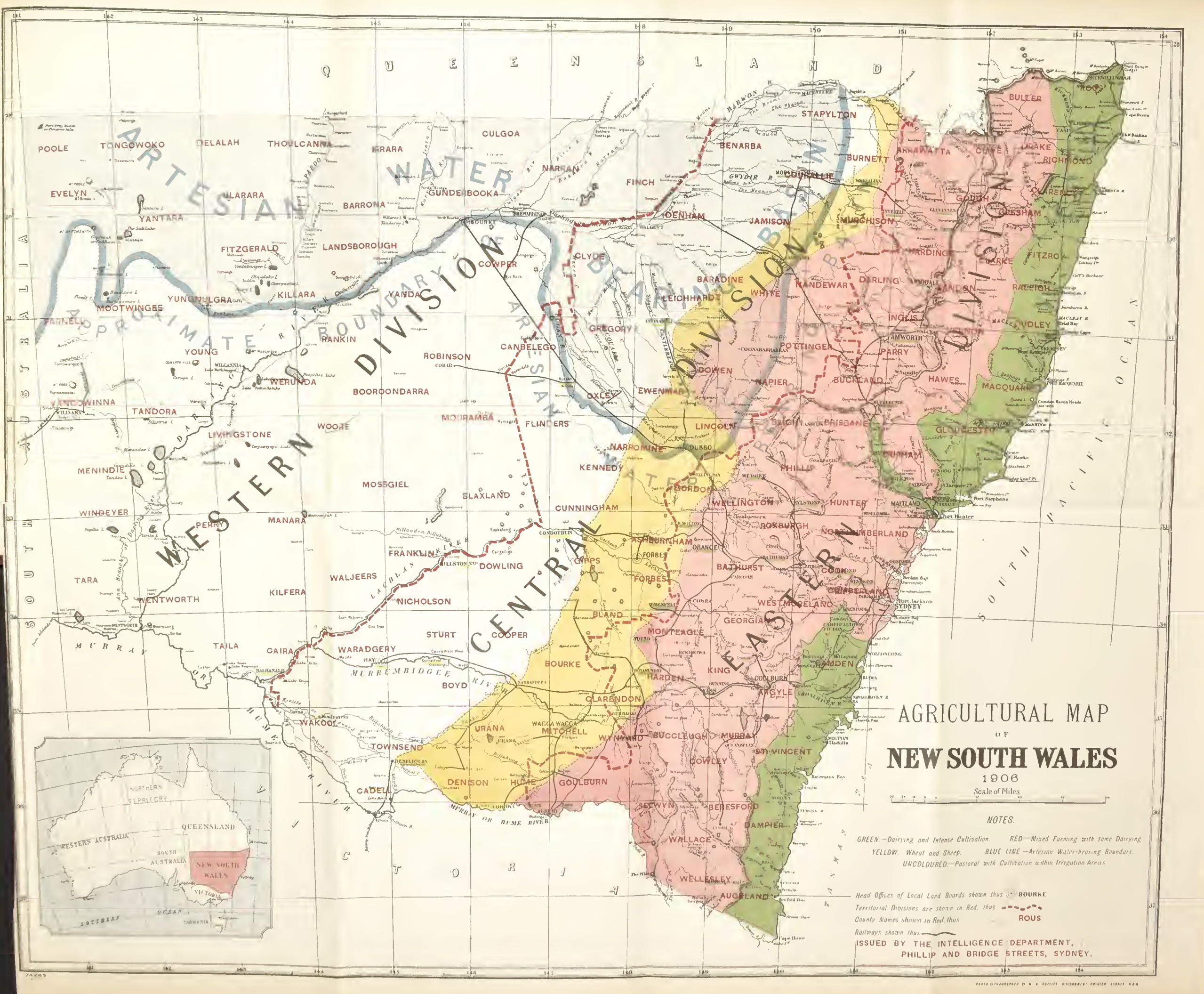
- G Gold
- S Silver
- C Copper
- T Tin
- I Iron. (The Iron-bearing areas have not been accurately defined)
- Triassic Coal Measures
- Permian-Carboniferous Coal Measures (Productive)
- K Kerosene Shale
- D Diamonds and other Gems
- D Diamonds
- O Opals
- A Antimony
- Ch Chrome
- Tu Tungsten
- P Platinum
- B Bismuth
- Tr Tripoli
- M Mercury
- Boundary of Artesian Water-bearing Basin
- Bx Basalt

SKETCH
MAP
OF
NEW SOUTH WALES
SHOWING
LOCALITIES OF THE PRINCIPAL MINERALS

Revised to date under the direction of
E.F. Pittman AR.S.M. Government Geologist.

NOTE
Existing Railways and those in course of construction shown thus —
Principal Roads do do —

SCALE OF MILES
0 10 20 30 40 50 60 70 80 90 100



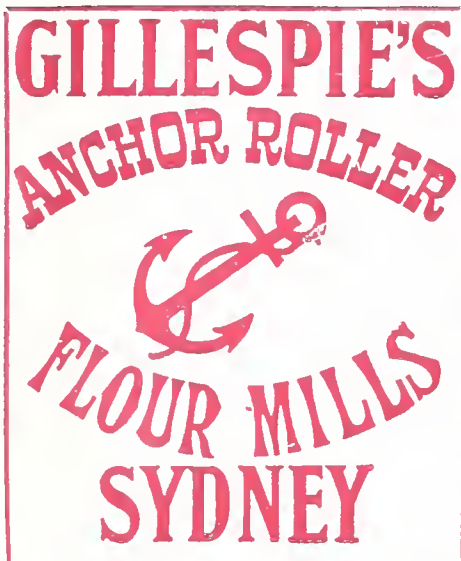
AGRICULTURAL MAP
OF
NEW SOUTH WALES

1906
Scale of Miles

NOTES.
GREEN.—Dairying and Intense Cultivation. RED.—Mixed Farming with some Dairying.
YELLOW.—Wheat and Sheep. BLUE LINE.—Artesian Water-bearing Boundary.
UNCOLOURED.—Pastoral with Cultivation within Irrigation Areas.

Head Offices of Local Land Boards shown thus (B) BOURKE
Territorial Divisions are shown in Red, thus (---) ROUS
County Names shown in Red, thus (---)
Railways shown thus (---)
ISSUED BY THE INTELLIGENCE DEPARTMENT,
PHILLIP AND BRIDGE STREETS, SYDNEY.

Two Brands Famous throughout the Commonwealth.



**New
South
Wales
Flour.**



**GILLESPIE BROS. & Co., ANCHOR MILLS,
BATHURST-STREET, SYDNEY.**

"SUPERB"

Flour is manufactured from the
finest wheats grown in Australia.



Mill and Offices—

**BATHURST-STREET, SYDNEY,
NEW SOUTH WALES.**

Australian Mortgage, Land, & Finance Co., Ltd.

(A. M., L., & F. Co.)

(Incorporated 1863)

(THE OLDEST PASTORAL INSTITUTION IN NEW SOUTH WALES),

WOOL, PRODUCE, AND GRAIN BROKERS. ♦ SYDNEY.

STOCK AND STATION AGENTS.

Capital, £4,000,000, in 160,000 £25 shares.

Subscribed	...	...	...	£3,000,000
Paid-up	...	...	...	520,000
Reserve Fund	...	...	...	250,000

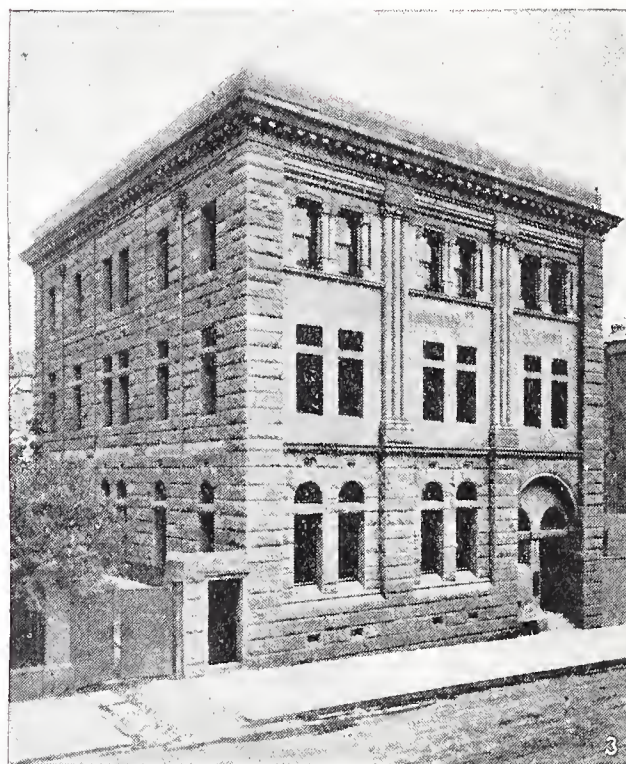
London Office:
13, Leadenhall-st.,
E.C.

Melbourne Offices:
103 and 105,
William-street.

Sydney Office:
4, Bligh-street.

Agents
throughout
the State.

Bankers:
The Bank of England
The Royal Bank of
Scotland
Messrs. Robarts,
Lubbock, & Co.
- and -
The Commercial
Banking Co. of
Sydney, Ltd.



SYDNEY OFFICES, BLIGH-STREET.

DIRECTORS IN GREAT BRITAIN:

Robert Henryson Caird, Esq.,
David Finlayson, Esq.,
Frederick Green, Esq.,
Henry J. Lubbock, Esq.,

Robert B. Ronald, Esq.,
George Slade, Esq.,
Frederick A. White, Esq.

Manager: C. U. Kingston, Esq.

MELBOURNE:
J. J. Falconer, Esq.,
Manager for Australia.

SYDNEY:
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London

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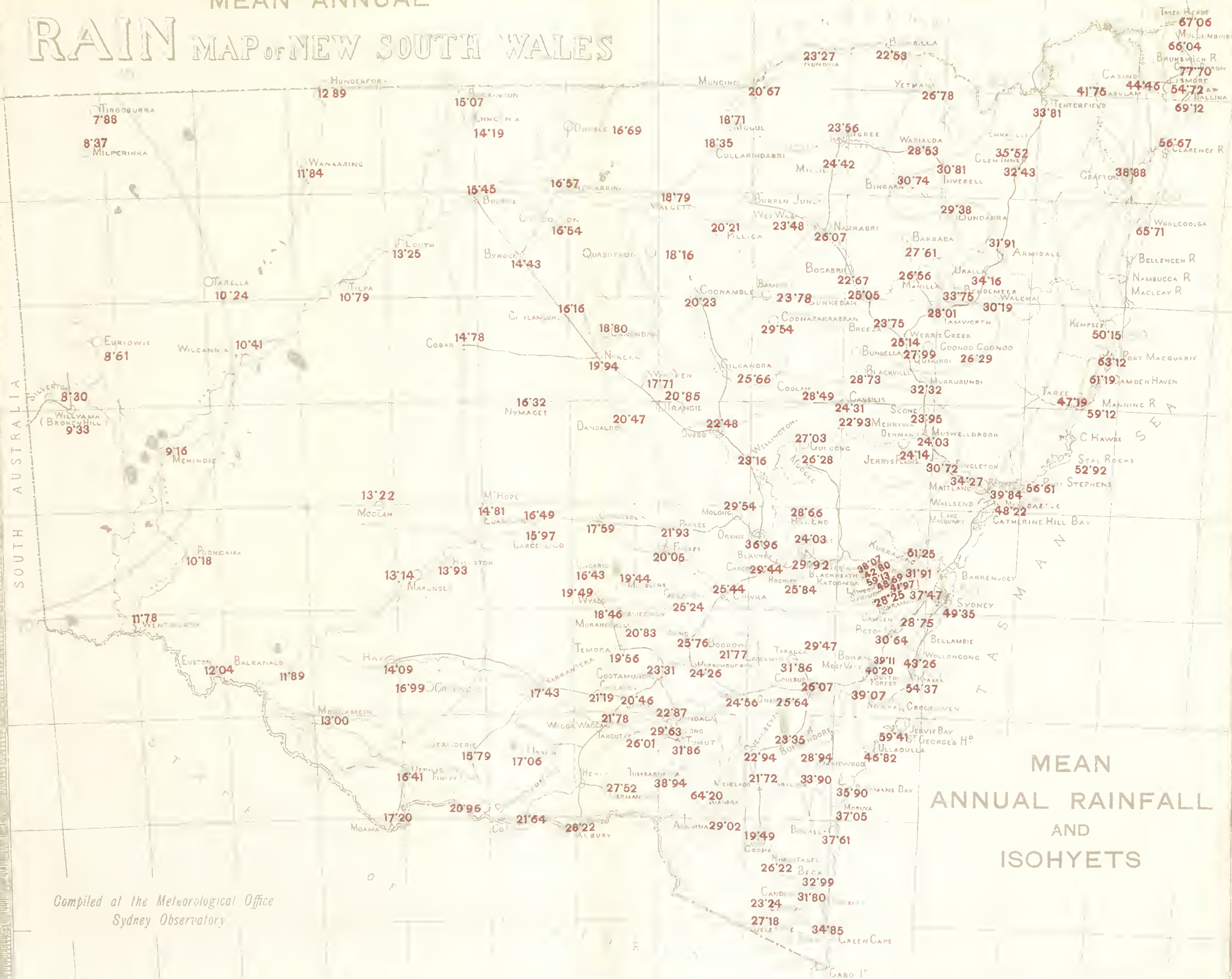
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RAIN MAP of NEW SOUTH WALES



BANK OF NEW SOUTH WALES.

ESTABLISHED
1817.

Paid-up Capital	£2,000,000
Reserve Fund	...	...	...	...	...	...	1,425,000
Reserve Liability	...	...	...	...	...	...	2,000,000

£5,425,000

DIRECTORS :

THE HON. CHARLES K. MACKELLAR, M.L.C., *President*.
 THE HON. REGINALD JAMES BLACK, M.L.C. | RICHARD BINNIE, Esq.
 SIR JAMES R. FAIRFAX, Kt. | HON. SIR NORMAND MACLAURIN, Kt., M.L.C.

SENATOR THE HON. JAMES THOMAS WALKER.

Auditors: HARRINGTON PALMER, Esq.; FREDERICK W. UTHUR, Esq.

General Manager: J. RUSSELL FRENCH.

HEAD OFFICE, SYDNEY.

THOMAS HUNT IVEY, *Manager*. LINDSAY WHITEHEAD, *Asst. Manager*.

LONDON OFFICE, OLD BROAD STREET.

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MELBOURNE BRANCH: Manager and Chief Officer for Victoria, RODERICK MURCHISON.

Branches in New South Wales: C. G. Alford, J. T. Ford, and W. J. Edwards, *Inspectors*.

Bathurst-street, Sydney	Barraba	Coolamon	Goulburn	Maitland	Orange	Tumut
Haymarket, Sydney	Bathurst	Cooma	Grafton	Manilla	Parramatta	Trangie
Pitt-street, Sydney	Bega	Cooamblie	Grenfell	Millthorpe	Penrith	Uralla
Royal Exchange	Bellingen	Cootamundra	Gulgong	Moama	Port Macquarie	Wagga Wagga
Branch, Sydney	Bombala	Corowa	Gundagai	Moree	Qucaubeyan	Walgett
Southern Branch, Sydney	Braidwood	Cowra	Gunnedah	Mosman	Quirindi	Warialda
Sussex-st., Sydney	Brewarrina	Crookwell	Hay	Moruya	Richmond	Waverley
William-street, Sydney	Broken Hill	Crow's Nest	Henty	Mudgee	Rozelle	Wellington
Adelong	Bungendore	Deniliquin	Inverell	Mullumbimby	Ryde	Windsor
Albury	Burra	Dubbo	Jerilderie	Murwillumbah	Scone	Wollongong
Armidale	Burwood	Dungog	Junee	Narrandera	Singletou	Wyalong
Ashfield	Camden	Eden	Kyogle	Narrabri	Tamworth	Wyong
Balmain	Campbelltown	Emmaville	Lismore	Newcastle	Taralga	Yass
	Casino	Forbes	Liverpool	Newcastle West	Taree	Young
	Cobargo	Gannamain	Lockhart	Newtown	Temora	
	Coff's Harbour	Glen Innes	Macleay	North Sydney	Tenterfield	

Branches in Victoria: Henry Norman, *Inspector*.

Melbourne	Benalla	Eaglehawk	Flinders-st. West (Melbourne)	Kyneton	Piper-street (Kyneton)	Tallangatta
Ararat	Bendigo	E. Collingwood	Fitzroy	Linton	Richmond	Wangaratta
Bairnsdale	Castlemaine	Echuca	Geelong	Maldon	Rochester	Warragul
Ballarat	Chiltern	Elmore	Inglewood	Mansfield	St. Arnaud	Warrnambool
Beechworth	Creswick			Malmsbury		Wodonga

Branches in Queensland: A. T. Halloran, G. J. Lever, R. T. Hilder, *Assistant Inspectors*.

Brisbaue	Bowen	Clermont	Fortitude Valley	Hughenden	Normanton	Roma	Townsville
Aramac	Bundaberg	Cloncurry	Georgetown	Ipswich	Oakey	South Brisbane	Warwick
Barcaldine	Cairns	Cooktown	Goondiwindi	Longreach	Rockhampton	Toowoomba	Winton
Blackall	Charters Towers	Croydon	Gympie	Maryborough			

Branches in New Zealand: E. J. Finch, *Inspector*.

Wellington	Carterton	Eltham	Hastings	Lawrence	Nelson	Patca	Waipawa
Amberley	Charleston	Feilding	Hawera	Marton	New Plymouth	Shannon	Waipiatia
Ashburton	Christchurch	Geraldine	Hokitika	Masterton	Norsewood	St. Bathaus	Waipuhurau
Auckland	Dannevirke	Gisborne	Inglewood	Midhurst	Oamaru	Stratford	Wanganui
Blenheim	Dunedin	Greymouth	Invercargill	Napier	Pahiatua	Thames	Waverley
Bulls	Edendale	Gore	Kaponga	Naseby	Palmerston Nth.	Timaru	Westport
Cambridge	Eketahuna						

Branches in South Australia: Adelaide, Port Adelaide.

Branches in Western Australia: Perth, Boulder City, Coolgardie, Fremantle, Kalgoorlie.

Branch in Fiji: Suva.

Agencies within the States:

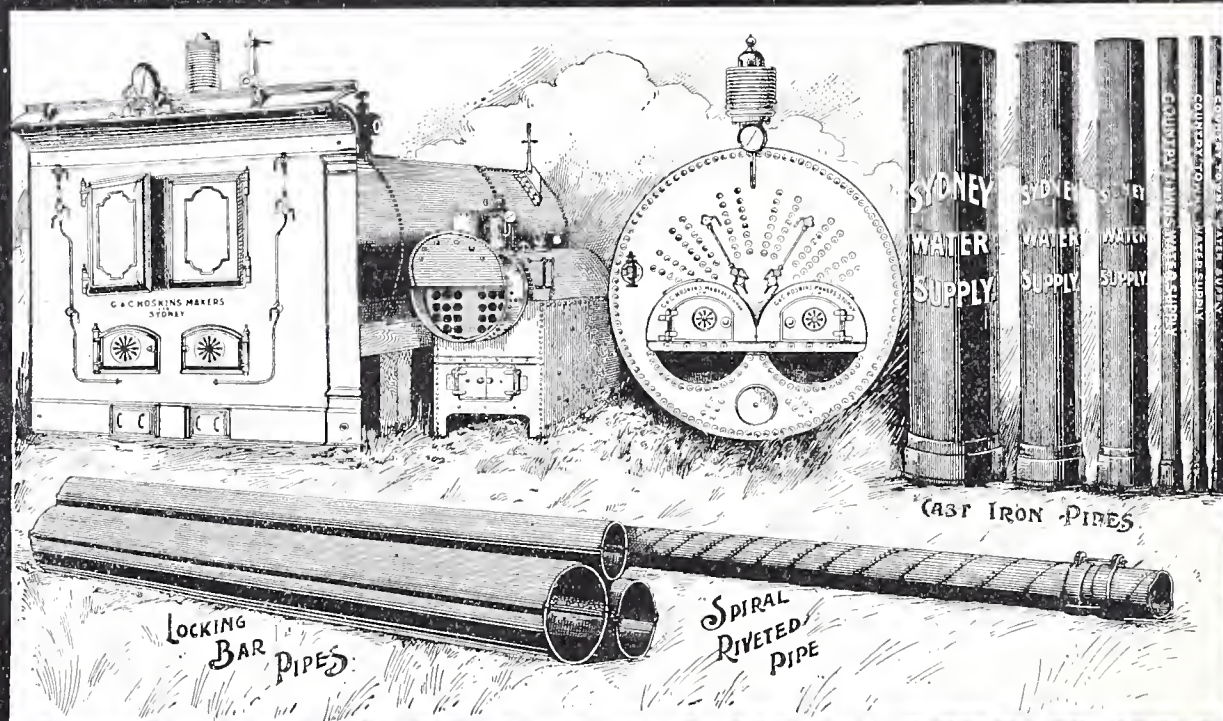
TASMANIA: The Commercial Bank of Tasmania, Limited. WESTERN AUSTRALIA: Western Australian Bank.

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SCOTLAND.—The Royal Bank of Scotland.
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INDIA, CHINA, AND CEYLON.—National Bank of India, Ltd., Chartered Bank of India, Australia, and China, Hongkong & Shanghai Banking Corporation, International Banking Corporation, Mercantile Bank of India, Ltd.
BATAVIA, MANILA, AND JAPAN.—Chartered Bank of India, Australia, and China, Hongkong & Shanghai Banking Corporation, Yokohama Specie Bank.
SOUTH AFRICA.—Standard Bank of South Africa, Ltd., Bank of Africa, Ltd., National Bank of South Africa, Ltd.
NOUMEA.—Bauque De l'Indo Chine.
CUBA.—Royal Bank of Canada.
WEST INDIES.—Colonial Bank.
MAURITIUS.—The Bank of Mauritius.
HONOLULU.—First National Bank of Hawaii.

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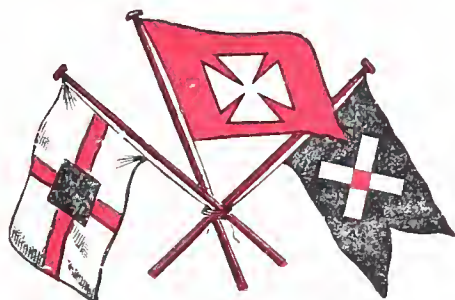
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Fine Full-powered Steamers, Specially Constructed for the Colonial Trade, having EXCELLENT ACCOMMODATION FOR FIRST AND THIRD CLASS PASSENGERS, are despatched at REGULAR INTERVALS.

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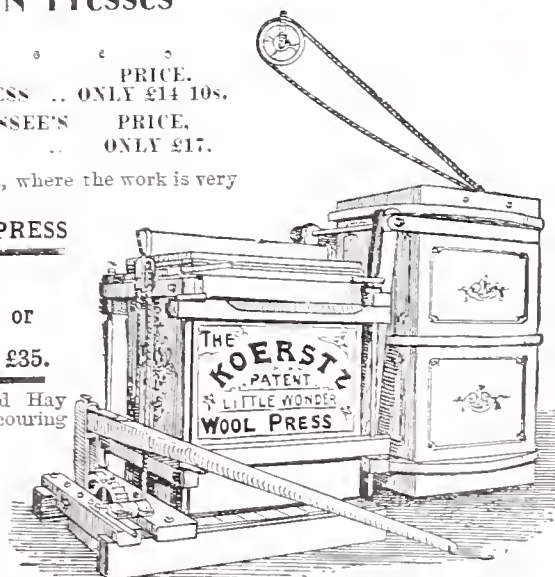
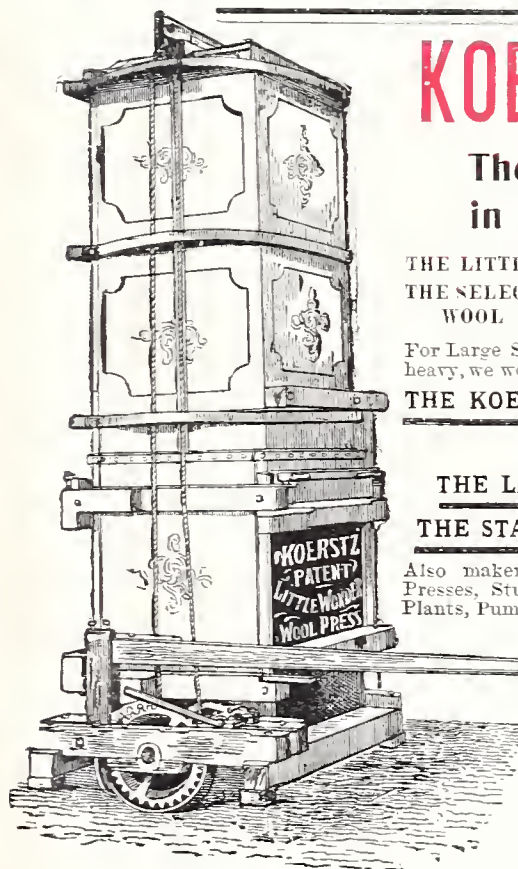
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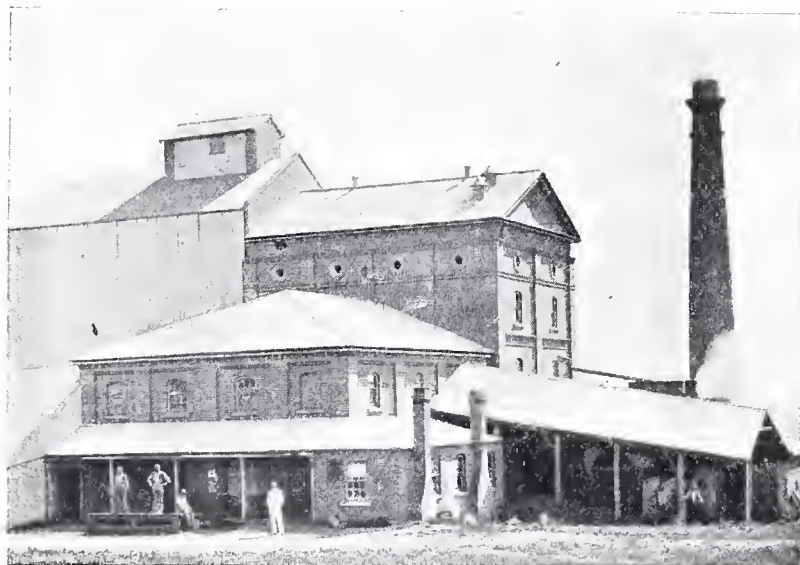
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HOBART, TASMANIA.

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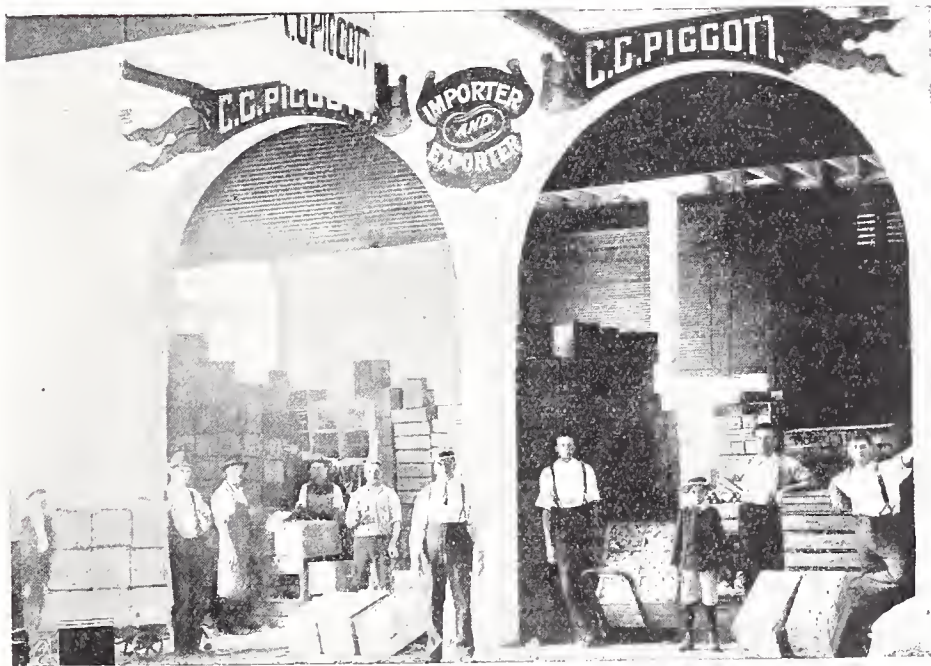
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