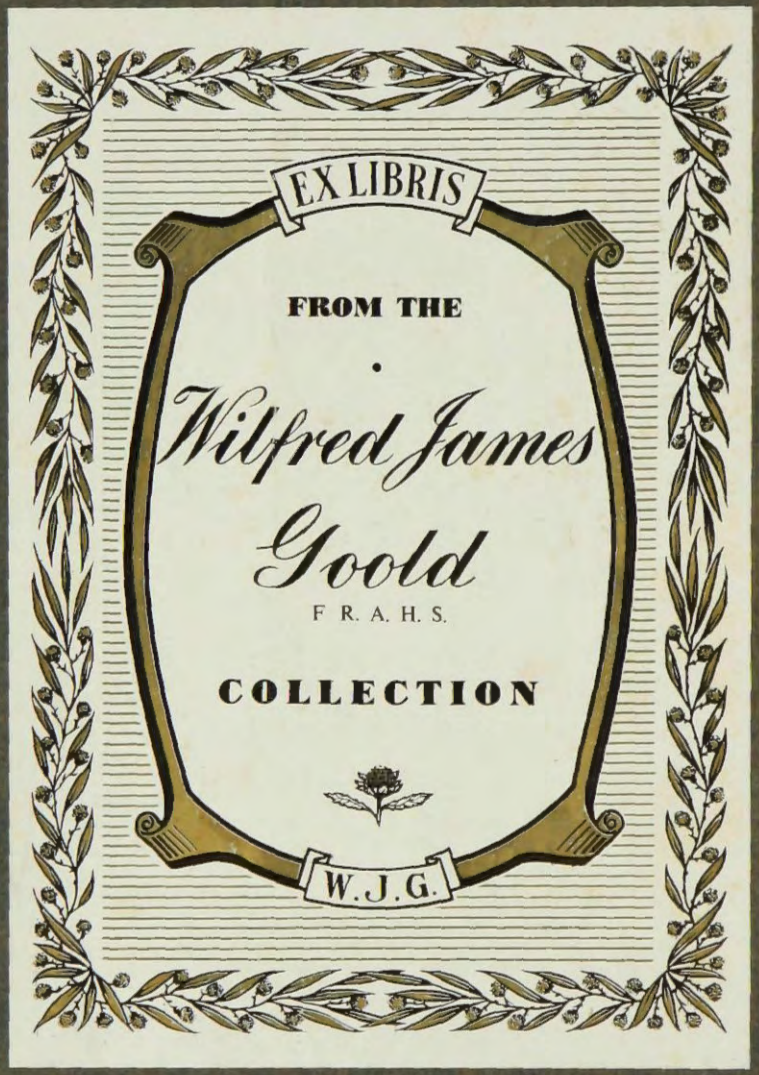
Newcastle N.S.W.

Historical & Industrial Scene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Historical, Industrial and Scenic

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NEWCASTLE TOWN HALL

FOREWORD.

NEWCASTLE, New South Wales, is the port and pivotal point of one of the greatest coalfields in the world, and by far the largest and most valuable in the Southern Hemisphere. Some of the coals rank with the best gas and steam coals of Great Britain and America, and enormous quantities have been proved to exist, with seams up to 32ft. in thickness, without a band. Geological conditions point to concealed reserves of still greater extent; and, with careful systems of mining, these great beds of fuel will last for hundreds of years.

Industry and Commerce

The title, "the Birmingham of Australia," has been applied to Newcastle, but it is by no means apt. Rather is it the Pittsburg of the Southern Hemisphere. Birmingham is famed for its manufactures of non-ferrous metals; Pittsburg is the centre of the iron and steel trade of the United States; and Newcastle holds a like position in Australia. No city south of the equator has command of coal deposits and iron ore such as are at hand for utilisation at Newcastle; and in this respect the analogy between Pittsburg and Newcastle is remarkable, with the advantage on the side of Newcastle, inasmuch as it is a deep-sea port, whereas Pittsburg is dependent upon river carriage, not always reliable when the streams are depleted, and with the prospective canal to Lake Erie still in the nebulous state.

Newcastle, on the other hand, faces the South Pacific Ocean, and is the rival of Sydney for the trade which flows over the bosom of that great expanse of water, commanding the highways to New Zealand, the Pacific Islands, the East, and America. A river port, its harbour is much more commodious than the great majority of river ports of the world; and the natural conditions are such that enormous expansion may take place along the south arm of the Hunter Rivers, in the main channel as far as Morpeth, and even up to Maitland, forty miles upstream; while Fullerton Cove needs but to be dredged to add hundreds of acres of deep water to the area of the harbour proper.

Iron, Steel and Electricity

The similarity with Pittsburg is marked further in the fact that Newcastle has by far the largest steel works in the Southern Hemisphere; it has several large subsidiary works, in which iron and steel are the raw material of manufacture; it is the centre of the electrical industry in Australia; and it will shortly be the centre of the chemical industry of the Commonwealth. Millions of pounds have already been spent on the iron and steel and electrical industries, and a commencement will probably be made during the next twelve months on the erection of large chemical works. Detailed reference to these industries will be found in the accompanying pages.

The immensity of local coal deposits will compensate for that absence of natural water power which some European countries, in common with Canada, possess on such a bounteous scale. Mighty Power Houses, operated under State and private ownership, are in action, and extension is contemplated. Newcastle and Maitland coals are also rich in volatile hydrocarbons, and successful experiments have already been made in the extraction of oil. A high-grade benzol is on the market, the product of the Broken Hill By-Products Proprietary Plant; and enterprising experimenters are hopeful of satisfactory commercial results from various coals which have been tested. Success in this direction will atone for the lack of natural oil deposits in Australia.

Shipping and Shipbuilding

The Port of Newcastle offers greater facilities for shipbuilding than any other estuary in Australia. Around the whole frontage to the harbour, on the two arms of the Hunter River, and around Fullerton Cove, the greater portion of the land is only a few feet above tide-level; and docks and workshops can be built at a minimum of cost.

The harbour entrance and basins have depths of water which permit of vessels drawing over 28ft. to enter and leave freely; and it is expected that in a few years there will be 30ft. at low water, which will allow of the largest ocean-going steamers trading with Newcastle. The T.S.S. "Ceramic," the longest steamer trading to Australia, and of nearly 19,000 tons register, is a regular visitor, and steamers of the White Star, Port, Clan, Blue Funnel, Shire, and B.I. lines are frequently in the Port for cargoes.

Newcastle was for many years the third port in Australia. With the slump in world trading, she fell back, but is now forging ahead, and should regain her former position by the end of 1932. Discounting the mail steamers, which give the ports of the capital cities a marked advantage in the presentation of mere tonnage figures, Newcastle would far outstrip all the ports of the Commonwealth, excepting Sydney and Melbourne, and would in prosperous times closely approach the figures of these two great ports.

Wool, Grain and Fruits

The Valley of the Hunter River has been described by visiting experts as the most fertile tract of agricultural land in the world, and its immediate hinterland comprises the greatest grain-producing areas in existence. These, again, are supported by the vast plains which produce the famous fine wools of Australia. Sub-tropical and temperate-climate fruits of highest quality are also grown throughout the Valley. The produce of this marvellous area of wealth-producing country must perforce be shipped at Newcastle, and the prosperity of the city and its industries is assured. The potentialities are apparent, natural expansion must be rapid, and the field is open to men of vision seeking opportunities for the establishment of natural industries.

AERIAL VIEW OF NEWCASTLE HARBOUR

Newcastle Harbour

The Port of Newcastle, known in the early days of the Colony as King's Town, and later given the name of Port Hunter, was one of the first to be utilised; but for many years the greater portion of the shipping went up the river to Morpeth, or even as far as Maitland, and Newcastle handled very little of the tonnage. With the opening of the coal mines in and around Newcastle, a change was soon manifest, and this was most marked when the discovery of gold in California brought a large fleet of sailing vessels round the Cape. These came to Newcastle and picked up cargoes of coal to take across to the Golden Gate.

Gradually, the main portion of Newcastle Harbour was cleared of its sand banks, wharves were erected at convenient positions on the southern side, and later the long length of wharfage at the Dyke was constructed specially for the shipment of coal, while like attention was given to the Stockton side for the handling of coal from the Stockton Colliery.

In more recent years a large basin was dredged at Carrington, and portion of Throsby Creek was widened and deepened so as to enable large deep-sea vessels to lie at the basin cranes and take in coal, or at Lee Wharf for the discharging and loading of general cargo.

To-day the main general cargo wharf of Newcastle is Lee Wharf, which has a total length of 1,620 feet, affording three berths for large ocean-going vessels. Amongst those which visit the Port regularly are the S.S. "Ceramic" (18,900 tons), many of the vessels of the Port Line, of the Blue Funnel line, the British-India Company's boats, and others. Not only is this wharf strongly constructed, but there are three large sheds, one at each berth, for the housing of perishable cargo. The railway is brought in close to the wharf, and there is also a wide roadway, so that cargo can be delivered at the ship's side, or taken away from the wharves very quickly. In addition, just behind No. 3 shed, John Reid Ltd., a well-known Newcastle shipping firm, has erected large wool sheds capable of holding several thousand bales of wool.

Further westward is the Inflammable Liquids Wharf, at which some of the largest oil tankers in the world regularly discharge large quantities of oil for the different companies having tanks here. Nearby are the large, modern wool stores of the New England, North, and North-West Producers' Co., Ltd.

At the eastern end of the harbour, the King's Wharf provides considerable berthing accommodation for vessels, and this is the main wharf for the discharge of inward timber cargoes, large quantities of which reach Newcastle from oversea.

The whole of the coal loading is done at the electric cranes on the western side of the basin, at the hydraulic cranes at the eastern side, and at other hydraulic cranes on what is known as the Dyke, and facing the main channel. At the northern end of the Dyke is a long length of wharfage set apart for the shipping of timber for export.

The total length of wharfage in the harbour of Newcastle is 17,000. The depths at the different wharves are as follows:—

King's Wharf—23ft. to 24ft.
Lee Wharf—25ft. to 26ft.
Inflammable Liquids Wharf—26ft.
Bunker Wharf—being dredged to a depth of 30ft.
Sulphide Wharf—25ft. to 27ft.
Basin Cranes, Electric—28ft. to 29ft.; Hydraulic—23ft. to 27ft.
Dyke Cranes 11, 12 and 13—26ft.
Dyke Cranes from 5 to 10—22ft. to 24ft.
Timber Wharf—20ft. to 22ft.
Wickham Wharf—26ft.

The depth in the harbour entrance is 25½ft. at l.w.o.s.t., with average spring tides 5ft., and neap tides 3ft.

The number and capacity of the cranes in use for the shipment of coal, and which can also be utilised for heavy lifts, are as follows:—

CRANES ON DYKE

No. of Crane	Height from decking of wharf to bottom of waggon, jib high.		Reach from outer edge of wharf to centre of chain over hatch.		Description	Power	REMARKS
	Feet	Inches	Feet	Inches			
4	34	—	18	6	Hyd.	15 tons	
5	35	—	18	5	,,	15 ,,	
6	36	—	20	—	,,	25 ,,	
7	38	4	24	9	,,	15 ,,	
8	38	5	23	7	,,	15 ,,	
9	39	—	24	5	,,	15 ,,	
10	38	—	24	6	,,	15 ,,	
11	40	6	24	9	,,	23 ,,	
12	44	—	27	10	,,	15 ,,	These cranes have been lengthened in the hoist from 39ft. to 42ft. by taking ball off crosshead.
13	44	—	27	10	,,	15 ,,	

BASIN CRANES

1	42	—	28	10	Hyd.	15 tons	
2	42	—	28	10	,,	15 ,,	
3	42	—	28	10	,,	15 ,,	Of these Cranes, Nos. 1 and 2, 4 and 5, and 6 and 7, are worked as pair, whilst No. 3 is worked singly.
4	42	—	28	10	,,	15 ,,	
5	42	—	28	10	,,	15 ,,	
6	42	—	28	10	,,	15 ,,	
7	42	—	28	10	,,	15 ,,	

ELECTRIC CRANES

Number Erected and in Use 6

Height from decking of wharf to underside of 10-ton coal hopper when hoisted, 63ft. 6in.

Above height from L.W.S.T. .. .. 71ft. 9in.

Reach from outer edge of wharf fenders to centre of chain over hatch .. .. 39ft.

Clear way under crane, minimum N.S.W. Railway requirements, i.e. .. 15ft. x 15ft.

Speed Hoisting .. .. 100ft. per minute, two motors

Speed Hoisting .. .. 50ft. per minute, one motor

Speed Slewing .. .. 300ft. per minute, at hook

Speed Travelling .. .. 100ft. per minute

Hoisting machinery operated by two 100 B.H.P. motors.

Slewing gear operated by one B.H.P. motor.

Travelling gear operated by two 25-B.H.P. motors.

These cranes are numbered from 8 to 13.

Power, 15 tons.

MANUFACTURING.

WHAT NEWCASTLE OFFERS.

The manufacturer who is seeking fresh fields for his activities asks, naturally—what are the special advantages of a particular locality, and what are the inducements presented to attract capital thereto? For if certain essential things are lacking, it is impossible to establish industries vigorous enough to compete with those of other districts and other countries. We have no fear of the result when the most searching inquiry is made into the subject of the industrial endowment of Newcastle and district.

A special feature of the Port of Newcastle is that the land runs back from the harbour, on the southern side, practically level to the foothills three or four miles away. On the northern side, this feature is still more pronounced, the land stretching away level for many miles. There is thus easy access by rail or road right to the ship's side, and the cost of handling cargo, inward and outward, is reduced to a minimum. A few companies have their own wharves, and it will be possible for other companies, establishing themselves here, to secure a like advantage.

Newcastle is, therefore, particularly fortunate in that it offers, first of all, water carriage from the main harbour and from places up the river as far as Morpeth, to any port in Australia or in the world. This is one of the factors which influenced the Broken Hill Proprietary Company and other companies in coming to Newcastle, and it is one of the important inducements which we confidently place before those who may be looking this way for the starting of industries.

In addition to the water-carriage, Newcastle and many of the towns of the Hunter River Valley are on the main Newcastle-Sydney-Northern Railway, and products can be handled quickly and easily by rail as well as by boat.

Cheap land is another important feature. This is obtainable around Newcastle and along the navigable waters of the Hunter River, some of the towns up to twenty miles away in a direct line being admirably adapted for fruit and vegetable preserving and evaporation.

Cheap electric power is available over the whole of the Newcastle area, and particulars of current supply and charges are given on another page. The city has a permanent supply of excellent water, gas is obtainable by those who may require it, and raw materials of all kinds are easily procurable.

Manufacturers who start operations at Newcastle have not only a steady market amongst the 300,000 people resident in the Valley of the Hunter, and whose spending power per head is probably higher than that of the residents of any other area in the world; but they also command the rich North and North-West, where the pastoral and wheat industries yield excellent returns, and to which districts Newcastle sends many of its products.

The rapid extension of the wheat-growing areas in the North and North-West points to big developments in the flour-milling industry. Newcastle has one modern flour mill, but the demand from the East for wheaten flour and offal is increasing rapidly, and this presents an opening in this important industry.

Meteorological conditions are very favourable. There are not the extremes of temperature met with in other countries, and there is no wet season to hamper industrial operations. Fuller particulars under this heading will be found elsewhere.

Electric Power

Newcastle is particularly fortunate in possessing one of the most modern electric power and lighting systems in the Commonwealth. Electricity in any quantity at four different voltages and two frequencies can be supplied for industrial purposes, and the rates for all consumers compare favourably with those of the leading electricity supply undertakings of the world.

The Newcastle City Council controls the supply of electricity for domestic and power purposes, and has reticulated the whole district. This service is largely availed of, and numbers of big industries depend entirely on this source for power. The mains extend 20 miles in some directions.

That there has been remarkable growth in the development of the electric supply system of the city and district, is shown by the fact that the City Electric Supply Department sold 776,772 units in 1910, and 34,300,000 in 1930.

The main source of electric supply for Newcastle is the modern and splendidly-equipped Zara Street Power Station of the Railway Department of New South Wales. This is situate close to the entrance to Newcastle Harbour, on the city side, where unlimited quantities of cool salt water for condensing purposes are available. This great station has generated electrical energy to the amount of 57,000,000 kilowatt-hours in one year, and is capable of a much greater output. The electric tramway system is operated with power from this station, and also the electric cranes for coal-loading,

while it supplies the current for lighting wharves, railway yards, etc. From it, the City Electric Supply Department purchases current in bulk, and reticulates it. Other bodies also draw from it; and in 1930 41,315,000 kilowatt-hours were supplied to outside bodies, 15,376,000 kilowatt-hours were used for departmental purposes, and 6,261,000 for tram traction.

In addition to the above, the Broken Hill Proprietary Co., Ltd., has a very fine electric power plant for the supply of electric power and for lighting throughout its extensive works; the Caledonian Collieries Limited has a modern power plant at Cockle Creek, eight miles south of Newcastle, which supplies power for colliery working and current for lighting purposes over a large portion of the Maitland coalfield; and other organisations also generate and supply current for power and lighting in the Newcastle-Maitland area.

Recently, an electrical expert speaking on the subject, said: "Newcastle has all the essentials tending to make it one of the leading industrial areas in Australia," and he forecasted heavy and rapidly-increasing demand for electric power. The demand can be met fully for all classes of industry.

Newcastle's Dockyard.

NEWCASTLE is one of the most important ports of the Commonwealth, and the tonnage of vessels inward and outward for 1932 should place it third on the list, next to Sydney and Melbourne. As befits such a port, it has a splendid floating dock of 15,000 tons capacity, and a dockyard with the most modern equipment.

The dockyard is known officially as the Walsh Island Dockyard and Engineering Works, being owned by the Government of New South Wales, and situate on Walsh Island, at the junction of the two arms of the Hunter River and immediately opposite the B.H.P. Co.'s Steel Works.

The island has an area of 400 acres, 125 of which are covered by workshops and cranes. The intention is to link up the island with the mainland by means of a barrage across the southern arm of the river near Hexham—(recently completed)—and by connecting the islands in the delta, down to Walsh Island. When all these preparatory works are completed, a railway will run from the main Northern Railway down to the Dockyard.

The works were commenced in 1914, and were equipped for shipbuilding, ship-repairing in all branches, bridge-building, and general engineering. The depression in the shipbuilding trade affected Australia, in common with other countries, and so other branches of manufacture were developed, including all-steel railway carriages, railway rolling stock, electrification work, colliery skips, welded steel pipes, and cast-iron pipes.

From the outset, the Dockyard was splendidly equipped with modern machinery, and additions to the plant have been made from time to time, including an extensive electric welding plant, with a continuous supply of 4,000 amps. The laboratory is also thoroughly equipped with modern appliances for testing and scientific investigation, and a competent laboratory staff is engaged. The range of machinery may be estimated from the fact that the travel of the largest planing machine

is 23ft.; the largest diameter that can be turned on lathe, 19ft.; and largest shaft that shafting lathe can take, 32in. centres x 41ft. long. Castings of iron up to 30 tons can be made at the works. A huge 2,000-ton press is installed.

In the shipyard are three slipways or building berths, on which vessels up to 6,000 deadweight have already been constructed, and a large number of smaller vessels—suction and bucket dredges, ferry steamers and tugs. Patent slipways are available for docking small vessels, one capable of taking vessels of 230ft. in length and up to 600 tons deadweight; and the other will handle vessels 160ft. long and 300 tons in weight.

A large amount of work of varied nature has been done at the Island, 2,500 men being employed at one time; but the most notable achievement was the construction of the floating dock. The dock was designed to suit local conditions, and at the same time to comply with Admiralty requirements. The dock was built in three sections, of approximately equal lengths, and it is of the self-docking type, any two sections being capable of docking the third section. One unit of 210 feet will lift 4,000 tons, and the other unit, comprising two sections of 210 feet each, will deal with vessels up to 11,000 tons. For the docking of ships of maximum capacity, the two units are bolted together, making a length of 630 feet, clear width of entrance 82 feet, and lifting capacity 15,000 tons. Each unit is self-contained.

A floating dock, compared with a graving dock, offers special advantages to the shipowner, the chief points being improved light and ventilation whilst vessels are undergoing repair and painting; the current of air facilitates the drying of paint, and thus the job is released more quickly; a longer vessel can be lifted by allowing a reasonable overhang; the floating dock can be readily trimmed, so that the line of keel blocks follows the extreme rim of a vessel, and it can also be listed, if necessary; and such a dock is often preferred on account of its flexibility and consequent possible adjustment to any permanent set in a ship's keel line.

The dimensions of the floating dock are as follows:—

Lifting Capacity	15,000 tons
Length (overall)	630 feet
Clear width of entrance	82 feet
Depth of water over keel blocks	26 feet

DOCKS USED AS TWO UNITS

Large Unit—Lifting capacity	11,000 tons
Length (overall)	418 feet
Clear width of entrance	82 feet
Water over keel blocks ..	26 feet
Small Unit—Lifting capacity	4,000 tons
Length (overall)	212 feet
Clear width of entrance	82 feet
Water over keel blocks	15 feet

The dock can accommodate vessels like the "Orama" and the "Ceramic," and with the increasing trade of the port of Newcastle, a number of the larger vessels will doubtless be docked at Walsh Island.

COAL RESOURCES

Newcastle's Enormous Wealth

Coal is still the world's chief agent for the production of power for industrial and commercial purposes, and it will continue to be so until man solves the problem of utilising solar radiation and tidal energy.

Newcastle is in the fortunate position of commanding the full output of one of the world's richest coalfields, and of being the port of shipment for cargoes of this mineral sent oversea. The latest world estimate of coal gives to Oceania about 134,000,000,000 tons, and of this huge quantity a very large proportion is found in the Newcastle and Maitland coalfields, the centre of the latter being only 30 miles from Newcastle.

Professor Sir T. Edgeworth David, the eminent geologist, in his remarkable memoir on the Coal Measures of the Hunter River Valley, estimated that the aggregate thickness of coal seams over the greater part of the field is not less than two hundred feet. He adds: "This coal has in places a gross value of something approximating to one million sterling per square mile; and as, in the South Maitland coalfields alone, there are probably at least 150 square miles of land containing coal of that value in the aggregate, and these form but a fraction of the total wealth in coal of this State, it will be realised that in the matter of fossil fuel we have indeed a goodly heritage."

The horizon of the coal beds of the valley has been enlarged since Professor David wrote in 1907, and to-day it is known that we possess coal reserves which, with careful working and a high rate of extraction, will last hundreds of years.

Estimates of value have also to be revised in the light of present-day conditions. The Newcastle-Maitland coalfields have produced already more than £250,000,000 worth of mineral, and barely a tithe of the total quantity has been won up to the present time.

The quality of our coal is beyond question, and some of it is comparable to the best British bituminous coal. The difference in the coal from the Greta, Borehole, Burwood, Teralba, and other seams, is also remarkable, these ranging from the quick-burning, long-flame coals of the Greta seam —which are admirable for steaming and other purposes—down to the slow-burning Teralba coals, suitable for kilns, etc. Many of the coals are good coking coals, or yield excellent results when mixed.

The Mines Department of New South Wales has given careful consideration to the coal seams of Newcastle and Maitland, and has classified the mineral in three grades—A, B, and C.

A. Grade coal is of the highest quality, and is suitable for steam-raising, gas-making, and coking, with an ash content as low as five per cent., which compares favourably with the 4.6 per cent. of high-grade Pennsylvania coal. The calorific value has been carefully gauged, and stands at 11,500 to 13,500 B.t.u.

B. Grade coal has a calorific value of 10,000 to 11,500 B.t.u., with higher ash content, but this can be reduced by washing. This coal gives good results in different industries.

C. Grade coal is won from seams containing a considerable percentage of dirt, but this coal, also, is useful after washing or flotation.

Maitland coals, and also some of the coal from the Borehole (Newcastle) seam contain high percentages of volatile hydrocarbons, and successful results have been obtained in the treatment of these coals for the recovery of mineral oil.

OTHER MINERALS

IRON ORE—Overlying some of the coal seams in the Newcastle District is a band of ironstone several inches thick. So far, nothing has been done in the direction of testing this ore, but it may yet prove to be of high metallic content. In the Port Stephens District, a short distance to the north of Newcastle, there are large deposits of titaniferous magnetic iron ore. The composition of the ore varies somewhat, but the greater portion contains from 40 to 50 per cent. of metallic iron, from seven to 20 per cent. of silica, from 3 to 16 per cent. of titanic acid, and from .05 to .2 per cent. of phosphorus.

LIMESTONE.—The valleys of the Hunter and Manning Rivers contain many deposits of limestone, and other deposits occur in the Tamworth-Manilla district, to the northward. A high-grade limestone is obtained from the majority of these deposits, and the quantity available is practically unlimited. It is used in the iron and steel industry, and also in the manufacture of cement.

Under Fullerton Cove, which is an extension northward of the Port of Newcastle, there is an immense deposit of shell, which is being developed for lime-making, for use in cement manufacture. This shell produces the highest quality of lime, and it is estimated the deposit contains at least two million tons.

OIL SHALE.—At the present time, attention is being directed particularly to the finding of natural deposits of oil in Australia, and to the production of oil from oil-shale. On the upper Hunter and also throughout the valley of its largest tributary, the Goulburn River, there are enormous deposits of oil-shale, the yield from which is very high. At Baerami, the Government has undertaken development work, and a tunnel which has been driven into the hillside has proved the deposit to be of great extent and exceptional quality. Other deposits are being examined, and the natural result of the working of these deposits will be the establishment of oil refineries at Newcastle, which is comparatively close to the shale area, and is the natural port for distribution throughout the Commonwealth.

IRON AND STEEL

Newcastle holds Premier Position

The working out of some of the collieries adjacent to Newcastle, and the opening of the Maitland field about twenty-five years ago, afforded ground for the belief in many quarters that the city would meet the fate of all mining towns, and that in a short period it would be only the shadow of its former self. As a matter of fact, the day of Newcastle's most notable advancement was only just dawning.

During 1911, the Broken Hill Proprietary Company, Limited, decided to enter upon the manufacture in Australia of iron and steel. Much thought was given to the determination of the site for such work; and the Company's experts decided that none offered such advantages as did Newcastle. That decision, and the subsequent activities of the Company did more in ten years for the advancement of the city than had eighty years of coal-mining. Not only so, but it directed the attention of the whole world, and particularly of British manufacturers, to the potentialities of Newcastle.

The site chosen by the Broken Hill Proprietary Company was a large area of low-lying land at what was known as Port Waratah, close to the junction of the northern and southern estuaries of the Hunter River. It was flooded during every tide, and it seemed an impossible task to create thereon great blast furnaces and rolling mills.

However, the task was tackled with indomitable energy and high engineering skill. The low area was raised with sand dredged from the harbour, 25,000 piles were driven for the foundations of the plant, and in two years and three months from the driving of the first pile—24th January, 1913—the first blast furnace was blown in: 8th April, 1915. Sixteen days later—on 24th April—the first rail was rolled, and Newcastle had become, overnight as it were, the centre of the iron and steel industry of the Southern Hemisphere.

The Company draws its ironstone from the enormous deposit at Iron Knob, South Australia, which is exceptionally high in metallic content, yielding up to 69 per cent. of iron. Limestone is brought from Devonport (Tasmania) by water, and railed from Taree and Attunga, both of which places are to the north of Newcastle, their natural port. Chrome ore is brought from Barraba, in the North, and from Gundagai in the South, and also from Queensland and West Australia. The whole of the coal used is obtained in the Newcastle District, and is converted in the splendid coking and by-product plant.

The results obtained from the treatment of iron ore from South Australia were remarkable, and the output per shift constitutes probably a world record. However, the demand for the Company's iron and steel grew so rapidly that it was not long before a second blast furnace had to be erected, and at the peak period of the Company's operations nearly 5,000 men were employed. The economic and industrial slump throughout the world has affected this, as well as all other industries; but there are signs of revival; and that the Company has complete confidence in the future is proven by the erection of the largest Wilputte oven by-product recovery plant in the British Empire, which was brought into use in 1930.

Some idea of the magnitude of the Company's operations may be gained from the following figures for the six months ended 31st May, 1932:—

	Tons
Ironstone Shipped	158,863
Limestone Quarried	29,371
Coke Produced	100,640
Pig Iron Produced	90,433
Steel Ingots Produced	106,363
Sulphate Ammonia Produced	2,144
Commercial Steel Rolled:	
Rails	5,556
Fishplates	314
Merchant Bars, Shapes, Wire Rod	77,041
	Gallons
Tar Produced	1,169,463

Coking and By-Products Plant

The Wilputte coking plant, installed at the works, consists of two batteries each of 53 ovens, and a capacity of 15,600 tons of coal per week. It is the largest plant of the kind in the British Empire, and only two larger have been built in the world—one for the Tata Iron and Steel Co., of Sakchi, India, and one for the Ford Motor Co., of Fordson, U.S.A., the former consisting of 200 ovens and the latter of 120 ovens.

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The coal put through the ovens is obtained from the Company's own collieries, and from other mines in the district. In addition to supplying all the coke required at the works, the plant produces huge quantities of by-products, the annual capacity being:—

Coal carbonised	814,000 Tons
Coke produced	570,000 Tons
Tar	512,000 Gallons
Sulphate of Ammonia	10,200 Tons
Benzol	3,255,800 Gallons
Surplus Gas	4,883,000,000 Cubic Ft.

The gas displaces the use of raw coal at the Steel Works, and so cheapens the cost of producing steel.

In the construction of the plant, 6,000 piles were driven for foundation, and 20,000 cubic yards of mass and reinforced concrete used. Seventy per cent. of the whole of the material in the plant is Australian.

Provision has been made in the lay-out for two additional batteries of 53 ovens each, and the foundations are already piled for extensions of the by-products building plant and apparatus. The total cost of the plant was about £1,000,000.

The plant commenced actual production on 18th November, 1930, and announcement has been made, on behalf of the Company, that the quality of coke produced in the new ovens is much better in every respect than that hitherto manufactured. The results obtained in the blast furnace indicate that it is a very fine, fast-burning coke; and, generally speaking, the new plant has more than fulfilled the most sanguine expectation, and the results obtained have considerably helped the Company's position.

This statement is satisfactory from the point of view of steel manufacture, and as bearing out the contention that Newcastle and Maitland coals will make excellent coke, and at the same time give a high percentage of valuable by-products.

The following significant paragraph appeared in the brochure issued at the time when the ovens were started:—"The primary products that will be manufactured from this coal-distillation plant in these quantities, will yield derivatives that are essential in all basic processes employed throughout the country. The consummation of such schemes will benefit Australian life to a far greater degree than most people suppose. It marks a progress in chemical development that will be highly advantageous to agriculture, through the greater production of fertilizers, and to numerous other branches of industry wherein the manufacturing process depends on a plentiful supply of raw material for the production of fine chemicals."

These splendid works are in full operation in Newcastle, and they point the way to the establishment of other distillation plants, for the recovery, as the main products, of valuable fuel oils and chemicals, with coke as the by-product.

OTHER COMPANIES

The direct outcome of the establishment in Newcastle of the B.H.P. Co.'s Iron and Steel Works was the opening, in a few years thereafter, of such important works as Rylands Bros. (Aust.) Ltd., John Lysaght (Aust.) Ltd., Vickers-Commonwealth Steel Products Ltd., and the Australian Wire Rope Works Ltd. All these draw their basic material from the Iron and Steel Works, and they have contributed in no small measure to place Newcastle in the forefront of industry in the Commonwealth, and to give it a commercial and industrial stability which was lacking in the days when coal was the only product.

There are also other important mechanical engineering works—those of A. Goninan & Co. Ltd., Morison and Bearby Ltd., and J. & A. Brown (Hexham).

Reference to these works is essential in giving an outline of the industrial history of Newcastle.

Rylands Bros. (Aust.) Ltd.

The first of the subsidiary companies to be established after operations had commenced at the B.H.P. Steel Works was the Austral Nail Co. Pty. Ltd.

The Company had started operations in Melbourne, in 1891, for the manufacture of nails and barbed wire, and in 1911 it erected the first wire-drawing plant in the Commonwealth. In 1918, the works of the Company were transferred to Newcastle, a site having been selected close to the Steel Works, and the manufacture of all classes of wire products was commenced.

In 1921, the firm was amalgamated with Messrs. Rylands Bros. Ltd., of Warrington, England, and the name was changed to Rylands Bros. (Aust.) Limited. The plant was immediately extended, and the manufacture of wire netting was commenced. A few years later, the interests of the Company were merged with those of the Broken Hill Pty. Co., Ltd., with benefit to both companies.

The principal products manufactured by Rylands Bros. are:—Black and galvanized wire, barbed wire, wire netting, nail wire, wire nails, telephone wire, welding wire, black and galvanized strand wire, spring wire, steel fencing standards. The raw material is supplied by the Steel Works, in the form of rods of different gauges, and of chemical analysis suitable for the particular wire manufactured.

It is is interesting to note that, with the exception of some special machines which could not be made in Australia, the whole of the plant in use was designed and manufactured in the Company's workshops.

The peak output of the plant has reached 1,200 tons of wire and 350 miles of netting per week. With the brightening prospect for Australia's primary products, this well-established industry should soon be producing greater quantities of these staple manufactures.

Vickers-Commonwealth Steel Products Limited

This Company (originally Commonwealth Steel Products Limited) is an outstanding example of the success and development which follows when the public is given needed service. Established in 1918, when this State and the whole Commonwealth was in dire straits through the cutting off of supplies from Great Britain, the Company produces at its works high-class steel products by the electrical process, specialising in wheels and axles.

When production was commenced in 1919, the works employed about 140 hands, but the number rapidly increased until it stood at 600 in 1926. The general depression caused slackening of production, but with the return of industrial and commercial prosperity, the works will be amongst the busiest, and at the same time, one of the most important in Australia.

The works, which consist of foundries, tyre-rolling mills, axle forges, machine shops, assembly shops and testing laboratories, are built on 31 acres of land at Waratah, adjoining the main Northern Railway, with sidings running on to the property. The site is about four miles from the Port of Newcastle, whence shipment of the Company's products is made to all parts of the Commonwealth.

With the object of producing the highest quality of manufactures, the management installed extensive research laboratories, testing machines of various kinds, and micro-metallographical instruments, and engaged an expert technical staff. The result is, the Company's products are renowned throughout the Commonwealth for their high standard.

The Company has been associated, practically from the commencement of operations, with Taylor Bros. & Co. Ltd., of Manchester and Leeds, one of the best-known firms of tyre and axle makers; and in more recent years, with the Buckeye Steel Castings Co., of Ohio, U.S.A., well-known makers of automatic couplers.

The success thus far achieved augurs well for the future development of this Company, which plays such an important part in Australian industry and in the running of Australian railways.

The steel for the cast steel centres produced at the works is made in an electric furnace, resulting in steel of maximum refinement, and the Company is proud of the high quality of this particular product. The rolled steel tyres and forged axles are also produced of a metallurgical condition that will give maximum hardness and strength, combined with toughness and resistance to shock and fatigue. The Company holds, on the average, between 3,000 and 4,000 tyres on "call" for the different State Railways.

In the works, a 2,000-ton steam hydraulic press is part of the equipment for the production of tyres. It is one of two similar presses in the Southern Hemisphere.

Waratah manganese steel is one of the special products of this Company, and it is used largely for trackwork points, switches and crossings. The quality of this steel may be gauged from the fact that as high as 70.8 tons ultimate has been obtained, and 72 per cent. elongation, with cold bend through 90 degrees without fracture.

Stern frames for steamers, weighing 11 tons each, and measuring 34 feet from end to end, have been made at the works, and huge cast-steel gear wheels, weighing 13 tons, for Queensland sugar mills. Propellors for steamships, dredge buckets, and other large steel castings are also turned out.

AERIAL VIEW OF NEWCASTLE CITY

John Lysaght Aust.) Limited

The history of galvanized iron covers a bare three-quarters of a century, yet to-day plain and corrugated sheets comprise one of the necessary commodities of the world, in other industries, on the field and farm, and for the home. The need of the Commonwealth is met by the high-grade galvanized corrugated and plain sheets manufactured at Port Waratah by John Lysaght (Australia) Limited.

The firm of John Lysaght, Limited, founded in Bristol, England, in 1857, had had under consideration for some time prior to the advent of the Broken Hill Proprietary Company's Steel Works at Newcastle, the manufacture of galvanized iron in the Commonwealth; and the establishment of the Steel Works made it possible, by the supply of essential raw material, for the Company to commence operations, the site of the works being determined by the position of those of the B.H.P.

A suitable site was obtained close to the Broken Hill Co.'s works, and one of the most up-to-date sheet rolling and galvanizing plants in the world was put down at a cost of about £500,000 about ten years ago. Since that date, large additions have been made, and the effective production of the plant can meet fully the needs of Australia for plain and corrugated sheets.

"Sheet bars," the raw material used at the works, are supplied from the Steel Works, and these are rolled, annealed, "pickled" and galvanized by the most modern processes. About 100 expert workmen were brought from the Bristol and Newport manufactories of the Company when first the works were opened at Newcastle, and this fact, combined with the excellence of the steel supplied by the Broken Hill Co.'s Steel Works, has enabled John Lysaght (Aust.) Limited to produce sheets which compare favourably with the high-class product of the English Company.

Up to 1,000 men are employed at the works, and 80,000 tons of sheets can be turned out per annum. Doubtless, this quantity will be increased when there is a return to normal conditions, for the Company's product commands a ready sale throughout the Commonwealth.

The whole of the raw materials used in the manufacture of galvanized iron by the Company are obtained in Australia, from the iron, zinc and tin, to the necessary chemicals; and probably as many men are employed obtaining these raw materials as are engaged in manufacturing the finished product.

Wire Rope Works

An essential article of present-day industry, and particularly of mining, is the wire rope; and it is difficult to visualise the circumstances of the day when man did not possess this powerful and reliable agent to aid him in his undertakings.

Full investigation by well-known wire rope manufacturers in Great Britain, in association with the Broken Hill Proprietary Co., Limited, led to the establishment at Newcastle, in 1923, of wire rope works, the purpose being to produce ropes which would comply with the exacting British standards. The Company was registered under the name of The Australian Wire Rope Works Limited, the Companies associated in the undertaking being Bullivant and Co. Ltd. (London), T. and W. Smith, Ltd. (Newcastle-on-Tyne), Allan Whyte and Co., Ltd. (Rutherglen, Glasgow), Rylands Bros., Ltd. (Warrington), and The Broken Hill Proprietary Co., Ltd. (Melbourne).

The site chosen is at Port Waratah, where five acres of land were secured, and buildings were erected covering a large portion of this area. The works were designed and built on the most modern principles, and high-grade machinery was installed, including a Denison testing machine for whole ropes, with a capacity of 100 tons.

The ropes made at the works are now in use throughout Australia, and some of them have done phenomenal service. These include ropes for all kinds of colliery work, hawsers, towing ropes, cargo runners, and ropes, for cranes, hoists, slings, etc. Some of the longest ropes made by the Company include:—35,704 feet of 4⅛in. circumference, 6 x 7 "special acid" rope, for a big cement company in New South Wales, for use as an aerial ropeway, and made in eight lengths of 4463ft. each; 12,000 feet of 3⅛ in circumference, 6 x 7 "acid" rope supplied, for haulage purposes in a South

Coast colliery, in two lengths of 6,000 feet each; and 6,150 feet of 4in. circumference 6 x 7 "special acid" rope, for use in a mine in Queensland, and supplied in one length, the weight being over 14¾ tons. Further, 19,000 feet of 2in. circumference, 6 x 7 "basic" rope, for hauling in connection with an aerial ropeway in South Australia. This rope was supplied in one length.

In connection with this Company's operations, also, it is pleasing to note that the whole of the material is Australian. That it is of the very highest quality, and that the finished article will compare with ropes made in any other country, is proven by the fact that galvanized ropes up to 7in. circumference have been woven, with a breaking strain of 180 tons. Big development and a great future is before this Company equally with the other companies engaged in the iron and steel trade in Newcastle.

STEAMER LOADING COAL AT CRANES

Railway Workshops

Further evidence of the high standard reached in the industrial development of Newcastle is to be found in the Locomotive and Rolling Stock Workshops of the N.S.W. Government Railways at Cardiff, about eight miles from Newcastle.

The buildings now in use cover an area of over 150,000 square feet, and almost indefinite extension can be carried out without interfering with the present plant or with workshop production. In the matter of general lay-out, ventilation, lighting, and adequate spacing of machines, as well as the up-to-dateness of the machines, the workshops are the equal of anything in the world.

The present section of workshops comprise:—Erecting Shops (2), Fitting Shop, Wheel Shop, Machine Shop, Blacksmiths' Shop, Boiler and Mounting Shop, Boiler, Machine and Coppersmiths' Shop, Tender and Bogie Shop, Traverser Road, Potash Shed, Sub-station, General Store.

Twelve overhead, electrically-driven cranes are in use in the different shops, two of them of 75 tons capacity each, and ranging down to three tons.

In the sub-station, two rotary converters supply D.C. current at 600 volts, and high and low tension switchboards control the reticulation of current throughout the workshops.

The area of land owned by the Railway Commissioners at this site is 172 acres, and eventually the whole of the workshops at Newcastle will be congregated at this handy centre.

Newcastle's Water Supply

An ample water supply is essential to all industrial undertakings; and as far as Newcastle is concerned, this is assured through the activities of the Hunter District Water Supply and Sewerage Board.

The origin of the water supply scheme for Newcastle and the Lower Hunter towns was the establishment, about 50 years ago, of a pumping plant close to the Hunter River at West Maitland, with a settling reservoir of 100 million gallons, a storage reservoir at Buttai, some six miles away, and the reticulation of the area to be served by gravitation. The capacity of this plant had been largely outgrown in 1915, and the Chichester River Dam and gravitation scheme was determined upon.

The Chichester Dam is on the Chichester River, about 50 miles from Newcastle, and it has a capacity of 5,000 million gallons. The catchment is in mountainous country, with elevations of over 4,000 feet, and the virgin state of the country, with basalt formation, makes it ideal for a large water supply. Very little silt is carried into the rivers serving the dam, and the water is, therefore, practically always clear in the storage basin, and, being of soft, potable quality, requires no treatment either for drinking or for use in boilers.

The water is delivered to the storage reservoirs through a 36in. pipeline, and up to 16,000,000 gallons can be brought down daily. The capacity of the main reservoir and the high rainfall on the catchment area make possible the supply of quite double this quantity, by laying down another pipe line.

Newcastle is also favoured by the storage of large quantities of good-quality water in the immense sandbeds reaching from Stockton to Raymond Terrace on the northern side of the Hunter River, and which will yet be utilised for industrial purposes. Unlimited quantities of cool salt water are also available for condensing purposes.

BRITISH, AMERICAN, EUROPEAN
MANUFACTURERS

The Port of Newcastle and the Surrounding Area present to you Greater Facilities for the

ESTABLISHMENT OF NEW INDUSTRIES

than any other part of Australia.

Among these Facilities are:—

CHEAP LAND
CHEAP COAL AND COKE
CHEAP ELECTRIC POWER
PLENTIFUL WATER SUPPLY
IRON AND STEEL AT LOW COST
WATER CARRIAGE
RAIL CARRIAGE
WATER FRONTAGES

and command of the huge Markets of Sydney, Melbourne and Brisbane, together with an assured Market in the Hunter Valley and Northern New South Wales—amongst half a million people, in comfortable circumstances and with high purchasing power.

When considering where you will establish your Works in Australia, remember—

NEWCASTLE IS THE PITTSBURG OF AUSTRALIA

Regular Sailings by Modern Cargo Vessels

From Newcastle to all Australian Ports:

VICTORIA	*MELBOURNE and Geelong.*
SOUTH AUSTRALIA	*PORT ADELAIDE, connecting with other South Australian ports.*
WESTERN AUSTRALIA	*FREMANTLE, connecting with Perth and other Western Australian ports.*
QUEENSLAND	*BRISBANE, Mackay, Bowen, Townsville, Cairns* — *connecting with other Queensland ports.*

NEWCASTLE AGENTS:

Adelaide Steamship Co. Ltd.
Huddart Parker Ltd.
Melbourne Steamship Co. Ltd.

A.U.S.N. Co. Ltd.
Howard Smith Ltd.
McIlwraith McEacharn Ltd.

Watt Street.

Newcastle's Sea Transport Facilities to Interstate Ports

An important and essential factor to the Manufacturer contemplating opening up new fields for his products, is the existence of efficient transport services for the exportation of his goods. Newcastle—second City of New South Wales—is not lacking in this respect: the Interstate Shipping Companies' services extend to every Port in the Commonwealth. To the large and important capital cities, Melbourne (Victoria) and Adelaide (South Australia), a regular weekly service is provided, which connects with steamers from these main ports plying regularly to the intra-State ports; likewise a similar service is in operation weekly from Newcastle to Brisbane — capital city of Queensland — Mackay, Bowen, Townsville and Cairns, which are the main Queensland ports, and intra-State services connect with the many small outports. A regular service is also available to Fremantle, connecting with Perth, the capital city of Western Australia, and transhipping to the numerous intra-State ports.

Newcastle therefore affords the intending manufacturer excellent facilities for the export of his goods to all Interstate ports of Australia. The services are controlled by old-established Shipping Companies of experience on the Australian coast in the handling of all classes of cargo extending over a century.

WALSH ISLAND DOCKYARD & ENGINEERING WORKS

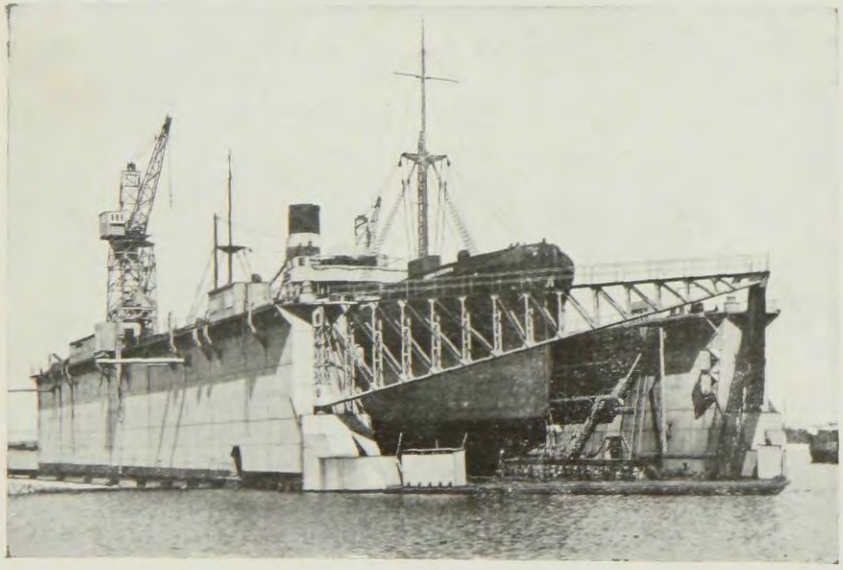
TELEGRAMS AND CABLES:
"DOCKYARD," NEWCASTLE.

NEWCASTLE, N.S.W.

TELEPHONE: STOCKTON 155 (5 LINES)
SYDNEY B06, EXTENSION 2733

Sydney Office: PUBLIC WORKS DEPT., PHILLIP ST. (Room 37, 2nd Floor).

Ship and Bridge Builders, Steel Carriage Makers, Iron Founders & Engineers



FLOATING DOCK	
Lifting Capacity	15,000 tons
Length (overall)	630ft. 0ins.
Clear Width of entrance	82ft. 0ins.
Depth of water over blocks	26ft. 0ins.

LARGE UNIT	
Lifting Capacity	11,000 tons
Length (overall)	418ft. 0ins.
Clear Width of entrance	82ft. 0ins.
Depth of water over blocks	26ft. 0ins.

SMALL UNIT	
Lifting Capacity	4,000 tons
Length (overall)	212ft. 0ins.
Clear Width of entrance	82ft. 0ins.
Depth of water over blocks	15ft. 0ins.

Walsh Island Dockyard & Engineering Works

WALSH ISLAND DOCKYARD & ENGINEERING WORKS is situated on the Hunter River, about two (2) miles from Newcastle, N.S.W. It has been in existence since 1914, and is specially equipped for Shipbuilding and Ship Repairing. Its value as a Shipyard has been considerably enhanced by the installation of a large Floating Dock, particulars of which are shown on the opposite page.

As a result of slackness in the Shipbuilding industry, the activities of this establishment of late years have been extended to include the manufacture of All-Steel Railway Carriages, Rolling Stock, All-Metal 'Bus Bodies, and Colliery Skips. Three hundred and fifty (350) All-Steel Railway Carriages have been manufactured for the New South Wales Railways, together with large quantities of Steel Masts and Bridges for the Railway Electrification Scheme.

Walsh Island has manufactured large quantities of Electrically-welded Steel Pipes, ranging from 10in. to 13ft. in diameter, this work being carried out by a special process embodying the use of Patent Automatic Welding Machines.

Bridges and Structural Steelwork of all classes are manufactured on the Island, and a large amount of this work has been supplied to the B.H.P. Coy., the Coppee Co. (Great Britain) Ltd., and the Sydney Harbour Bridge and City Railway.

Every facility exists for general Engineering, the shops being equipped with modern machines, including a Forging Press, capable of exerting a maximum load of 2,000 tons.

Forgings can be produced to Lloyd's requirements; also Steel Pressings up to 15ft. by 5ft., and deep pressed work in thick plates.

NEWCASTLE PUBLIC LIBRARY
W. J. Gould Collection

THE BROKEN HILL PROPRIETARY COMPANY LIMITED

IRON & STEEL MASTERS : COLLIERY PROPRIETORS

HEAD OFFICE : MELBOURNE

BRANCHES : SYDNEY, ADELAIDE, PERTH

WORKS : **NEWCASTLE, N.S.W.**

See Pages 43 to 49

Telegraphic Address: "Hematite," Newcastle, N.S.W.

RYLANDS BROS. (AUSTRALIA) LIMITED

WIRE MANUFACTURERS

ALL CLASSES OF WIRE AND WIRE PRODUCTS
FOR MANUFACTURING AND FENCING PURPOSES

REGISTERED OFFICE & WORKS:

NEWCASTLE, N.S.W.

See Page 49

Telegraphic Address:
"Wiremills," Newcastle

OFFICES IN ALL
CAPITAL CITIES

The Broken Hill Proprietary Company Limited

Iron and Steel Works, Newcastle

During the year 1911, The Broken Hill Proprietary Company, whose fame and fortune had been built up on Silver Lead mining in Broken Hill, conceived the idea of entering the steel business. After careful consideration and the examination of many sites, the Company decided to establish works at Newcastle.

The site chosen was indeed uninviting; a large area at Port Waratah, on the Hunter River, some two or three miles above Newcastle. Part of the land had once been occupied by a copper smelting plant, the remains of which—including a large brick stack and some dilapidated buildings—still remained. Part had long ago been a coaling station belonging to one of the coal-mining companies. The greater part of the site was black, slimy mud and mangrove swamp, awash at high water, and alive with mosquitoes.

On this uninviting site the Company set to work; owing to the nature of the ground, the whole plant is on pile foundations. The first pile for the first Blast Furnace was driven on January 24th, 1913.

The work did not proceed undisturbed. In 1914, when the actual construction had barely commenced, the War broke out. The bulk of the material required had to be imported from overseas, and the general upheaval seriously interfered with transportation. One ship, loaded with special bricks, which was actually in Australian waters, escaped—bricks and all—and was eventually interned somewhere in China.

The construction was pushed on energetically in face of disabilities, and on 8th April, 1915, No. 1 Blast Furnace was "blown in," and 16 days later, on 24th April, the first rail was rolled, and Newcastle was established as the centre of the steel industry in the Southern Hemisphere.

Newcastle Steelworks was a very present help in the troublous times during the War. As the War progressed and the energies of European countries were devoted to keeping their heads above water, Australia depended almost entirely on home production in Steel and Iron. The Broken Hill Proprietary Co. met every demand for more and more varied production.

When the Commonwealth Government decided to build ships, plates as well as scantlings were required. There was no plate mill in Australia, and importation was out of the question. Newcastle came to the rescue. The B.H.P. Company constructed special housings and gear for their Blooming Mill, including two steel castings weighing each 60 tons in the rough. They cast special ingots, and from their Bloom Mill—which is intended to produce rectangular bars, roughly 6 to 15 inches square—they turned out ship plates ¼in. thick up to 1 ton in weight, to Lloyd's Specifications, and of a quality which won the approval of the Inspecting Engineers.

When, during the War, the manufacture of Shells was started in Australia, the Newcastle Steel Works supplied the steel. When Shell making ceased in Australia, samples were sent to England, and orders were received from the War Office for 10,000 tons of Shell Steel, the B.H.P. Company's product being found entirely satisfactory. Large orders were received for Rails, also for shipment to South Africa and to New Zealand, and there was a considerable export trade in other lines.

The Broken Hill Proprietary's plant in 1915 consisted of one Blast Furnace and one battery of 66 Coke Ovens, 3 Steel Refining Furnaces, Blooming Mill and Rail Mill. Such was the demand for B.H.P. Company's Steel, and such the progressive spirit of the Company, that it may be said that from 1915 to the present day, enlargement and improvement has been continuous.

In 1918, a second Blast Furnace was blown, to be followed by a third in 1921. This increase in smelting capacity necessitated further coke supplies, and the batteries of 66 coke ovens became 99 in 1918, and 161 in 1919, and 224 in 1921. Two additional Steel Furnaces were added in 1916, and a further two in 1917, and a further two in 1925, making nine in all.

To relieve the 28in. Mill of the lighter sections, and to further increase the range of products, an 18in. Mill was put into operation in 1917; then, owing to the growing demand for Merchant Bar and various light sections, two smaller mills were erected—the 12in. Mill starting in 1917 and the 8in. Mill in 1918.

Australian Wire Mills were using imported Rod, which should not be, and in 1918 the B.H.P. Company started their Rod Mill to supply the Australian Wire Mills with Australian-made Rods. The Rod Mill ran "Single Strand," that is, rolled one rod at a time, and was driven by a single cylinder engine, built in America with the Mill. As the demand for Rod increased, the Engine was compounded, the low pressure side being built in Australia; and in 1921 the Rod Mill commenced to roll "Double Strand," that is, two Rods at a time, practically doubling the output.

While specific mention is made of the actual production units only, it must be remembered that each additional Furnace and Mill requires approximately an equal amount of accessories. Blowing Engines and Boilers, in the case of the Blast Furnace and Boilers; Heating Furnaces, Finishing and Handling Yards and Cranes, and Housing, in the case of Mills.

Mention has been made of new units added; space does not permit of a detailed reference to alterations and improvements to existing plant, all tending to larger and better production.

The original coke ovens were of the By-Product type, and the plant included gear for the production of Sulphate of Ammonia. In 1923, a plant for the production of Benzol was added.

In 1930 the whole of the old Coke Plant was closed down, its place being taken by a new Wilputte Plant, consisting of two batteries, each of 53 ovens, with a capacity of 570,000 tons of Coke per annum, the largest plant of its kind in the British Empire. The plant includes the necessary stills and machinery for saving By-Products and producing Sulphate of Ammonia, Benzol, Toluol, Solvent Naphtha, etc., for all of which there is a great demand. The Tar is treated for its simpler derivatives by the B.H.P. By-Products Company.

The latest addition to the Company's plant is the installation of a Continuous Billet and Sheet Bar Mill, which had been on hand for some time; this Mill is now in operation.

While some idea has been given of the growth and present extent of the plant, this covers the producing units only. In addition are extensive workshops, Foundries, both steel and iron, Roll Turning Shops, Machine Shops, Boiler Shops, Electricians and Patternmaking Shops, all busily engaged exclusively on work connected with both maintenance and extensions. A large staff of experts in the Test House and Chemical Laboratories watch over the quality of both raw materials and finished product; while a Safety Department, with a well-equipped Ambulance Station, takes care of the employees.

A feature of The Broken Hill Proprietary Company's plant is the general air of neatness and tidiness. Visitors expecting smoke and dust and disorder, are surprised to find asphalted roads, whitewashed walls and trim lawns and flower-beds all through the plant, while there is an almost entire absence of smoke.

The maximum capacity of the plant at present is as follows:—

Coke	520,000	tons per year
Pig Iron	520,000	„ „
Steel Ingots	520,000	„ „
28in. Mill	234,000	„ „
18in. Mill	140,400	„ „
12in. and 8in. Mills	78,000	„ „
Rod Mill	109,200	„ „
Sulphate of Ammonia	7,450	„ „
Benzol	1,300,000	Galls. „
Toluol	100,000	„ „
Solvent Naphtha	74,500	„ „
Tar	52,000,000	„ „

The following figures give the production for 1915/1916, the first year of operations:—

Pig Iron	101,479	Tons
Steel Ingots	86,400	„
Rails	43,193	
Fishplates	1,423	„
Blooms	4,695	„

As an indication of the tremendous growth of the Company's plant and output in a few years, the following figures for 1927 are given, this being the peak production year since the commencement of operations:—

Pig Iron	416,531	Tons
Ingots	387,928	„
Forging Blooms	6,922	„
Rails	81,797	„
Fishplates	5,538	„
Struct. Shapes, 28in. Mill	19,522	„
„ „ 18in. Mill	9,215	„
Merchant Bar, 18in. Mill	642	„
„ „ 12in. Mill	42,172	„
„ „ 8in. Mill	21,304	„
Steel Sleepers, 28in. Mill	7,814	„
Sheet Bar, 18in. Mill	31,322	„
Wire Rods	79,368	„
Coke	397,820	„
Sulphate	5,636	„
Benzol	1,109,261	Galls.
Toluol	31,460	„
Solvent Naphtha	38,676	„
Tar	4,175,852	

Since 1928, owing to the world-wide depression, the demand for steel has fallen off considerably, and the output of the works therewith. The Company looks forward hopefully to the trade improvement which is inevitable, and to a return to normal output.

The Company obtains its raw materials from all over Australia. Iron Ore comes from vast mountains of Ironstone in South Australia. Coal is obtained from the local mines, including the Company's own Pits. Dolomite and Magnesite are mined in N.S.W. Fluorspar comes from Queensland, Limestone from N.S.W. and Tasmania; Chrome from N.S.W., Queensland and Western Australia.

The following figures give the quantities used for the year 1927:—

Coal	890,675	Tons
Ironstone	692,387	„
Limestone—Local	33,700	„
„ Tasmania	165,597	„
Fluorspar	904	„
Phosphate Rock	3,244	„
Magnesite—Raw	7,008	„
Dolomite	15,665	„
Chrome Ore	500	„

Under normal conditions, the number of men employed by The Broken Hill Proprietary Company Limited directly in the Industry, are:—

Newcastle	4,700
Iron Knob, Whyalla and various Quarries	650
John Darling Colliery	350
	5,700

In addition to which it is estimated the following men are afforded indirect employment:—

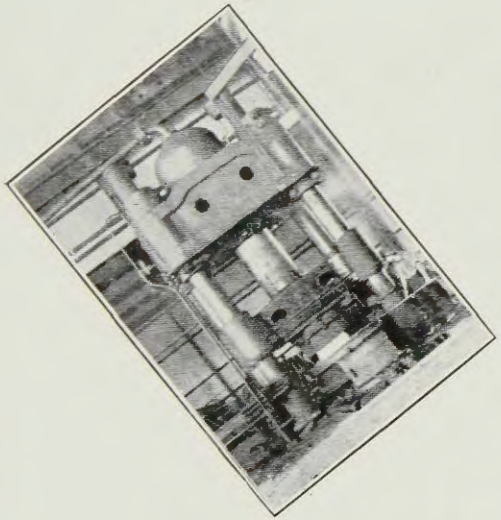
On Company's and other steamers carrying raw materials and products ..	500
In allied Industries: Messrs. Rylands, Lysaght's (at Newcastle and Sydney), and Australian Wire Rope Works	2,880
On the supply of coal and other materials, apart from the Company's employees (including proportion of Elrington Colliery employees	3,150
	12,230

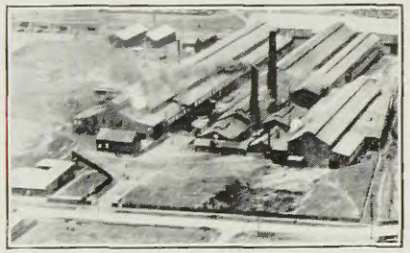
The weekly wages bill, under normal conditions, amounts to:—

Newcastle Iron & Steel Works	£27,000
Iron Knob, Whyalla (S.A.), Devonport, (Tas.), and at the various Quarries	3,000
John Darling Colliery	2,530
TOTAL	£32,530

Equal to per annum £1,691,560 direct, without taking into account any subsidiary companies or allied industries.

It is noticeable that the present maximum output of the Works is considerably in excess of the best year's production to date. This excess is a measure of the Company's confidence in the future of Newcastle as the hub of the steel industry in Australia.





VICKERS

COMMONWEALTH STEEL PRODUCTS LTD.

WARATAH, N.S.W.

MANUFACTURERS OF

INGOTS, BLOOMS, BILLETS, HEAVY & MEDIUM WEIGHT FORGINGS
LOCOMOTIVE, CARRIAGE & WAGON AXLES & TYRES
ROLLED STEEL ANGLE, SMOKE BOX AND
GEAR RINGS, HEAVY PRESSINGS,
STEEL CASTINGS

SUPPLIED IN CARBON OR SPECIAL ALLOY STEELS
TO ALL SPECIFICATIONS

REGISTERED UNDER LLOYD'S

Vickers-Commonwealth Steel Products Limited

The plant of Vickers-Commonwealth Steel Products Ltd., situated on the main Northern line, some four miles distant from Newcastle, New South Wales, was established in 1918 for the production of various steel products briefly outlined below.

Active production was commenced in 1919 and, with the close co-operation of established industries in Great Britain, steady growth has been made, resulting in considerable extensions to their original plant, which is now capable of expeditiously handling approximately 1,000 tons of Miscellaneous Steel Products monthly.

The Works are designed for the efficient handling of Assembled Railway Wheels and Axles, divided into four principal Departments; namely, Steel Foundry, Tyre Mill, Axle Plant and Assembly Shop, the three former Shops being so arranged to discharge their respective products into the Assembly Bay, thus ensuring continuity and efficient control of production.

STEEL FOUNDRY.—This is a spacious building, having a main central span of 60 feet by 600 feet long, fully equipped with modern tools, embodying latest Steel Foundry practice and served by two 20-ton Overhead Electric Cranes and numerous cantilever cranes, spaced at frequent intervals throughout its length.

This Foundry is laid out for the production of Carbon and Alloy Steel Castings up to approximately 10 tons weight, liquid steel being delivered by a nominal 6½-ton "Heroult" Electric Furnace. Modern heat-treatment furnaces and Sand Blasting installations permit of large tonnages of Steel Castings being handled daily.

The usual Pattern and Core-making Departments are conveniently located to ensure efficient control.

The major portion of the available floor space is devoted to the continuous production of Locomotive and Wagon Wheel Centres and Automatic Couplers, this Company having specialised in these classes of products for many years.

TYRE MILL.—The major activity of these Works is the manufacture of Rolled Steel Tyres of all descriptions, to suit the requirements of the various States throughout the Commonwealth and New Zealand, embracing a wide range of sizes from 12in. to 7ft. diameter.

The main span of the building housing this plant is 65 feet, with an overall length of 600 feet, a lean-to of 40 feet span providing accommodation for the machining and testing departments operating in conjunction with the Mill.

The handling of products during process of manufacture is efficiently undertaken by double track overhead cranes and monorail conveyor installations, the location of the heating furnaces and heat-treatment plant being such as to ensure the rapid passage of products through the various stages of production.

The introduction of modern machine tools and handling equipment has placed the Company in the forefront as producers of this class of product, and in pursuance of their policy to keep well abreast of modern practice, consideration is always given to the installation of the latest equipment to maintain the modern status of the plant and ensure productive efficiency comparable with similar industries throughout the world.

It will, therefore, be realised that every endeavour has and is being made to ensure production in this and other Departments at a minimum cost, commensurate with high quality and workmanship.

Production in this Department is not confined wholly to the manufacture of Tyres, but embraces the production at competitive prices of a variety of Rolled and Forged Steel Products, including Gear Rings, Pinion Blanks, Weldless Angle Rings and heavy Pressings.

The number of Tyres produced by this Department during the years 1920/31 exceeded 300,000.

AXLE PLANT.—While the main activity of this plant is the manufacture of Forged Steel Axles for Railway Rolling Stock, miscellaneous Forgings up to 5 tons weight in Carbon or Alloy Steels are undertaken to meet customers' requirements, under their battery of Steam Hammers and 2,000-ton Press.

Recent installation of modern single purpose and multiple duty machines have effected considerable economies in production of Axles, and materially increased the daily output of this Department.

An adjacent building houses a complete unit for the manufacture of Forged Carbon and Alloy Steel Balls for Tube Mills, employed by Gold, Cement, and other manufacturers, from which a considerable tonnage of product ranging in diameter from 2in. to 12in. is despatched each month.

ASSEMBLY BAY.—This Department is devoted to the final assembly of Wheels, Tyres and Axles delivered by the various Departments, and by means of modern Presses and Machine Tools, expeditiously handles each process and promptly discharges assembled sets in trucks operating on a sunken track at one end of the plant.

The modern Research and Metallurgical Laboratories, equipped with the latest approved appliances, materially assist toward the general efficiency of the Works in maintaining quality of this Company's products by its extensive research into metallurgical problems affecting the Steel Products manufactured by the Company and the subsidiary industries adjacent.

Bring back Prosperity by Buying Australian-Made

GALVANIZED IRON

Every penny you spend on Lysaght's Galvanized Iron is circulated in Australia. It gives needed employment to your fellow countrymen; it helps the exchange position; it does not increase the overseas debt; it will help to restore prosperity; and it gives you the highest quality Galvanized Iron at a fair price.

Note these facts :

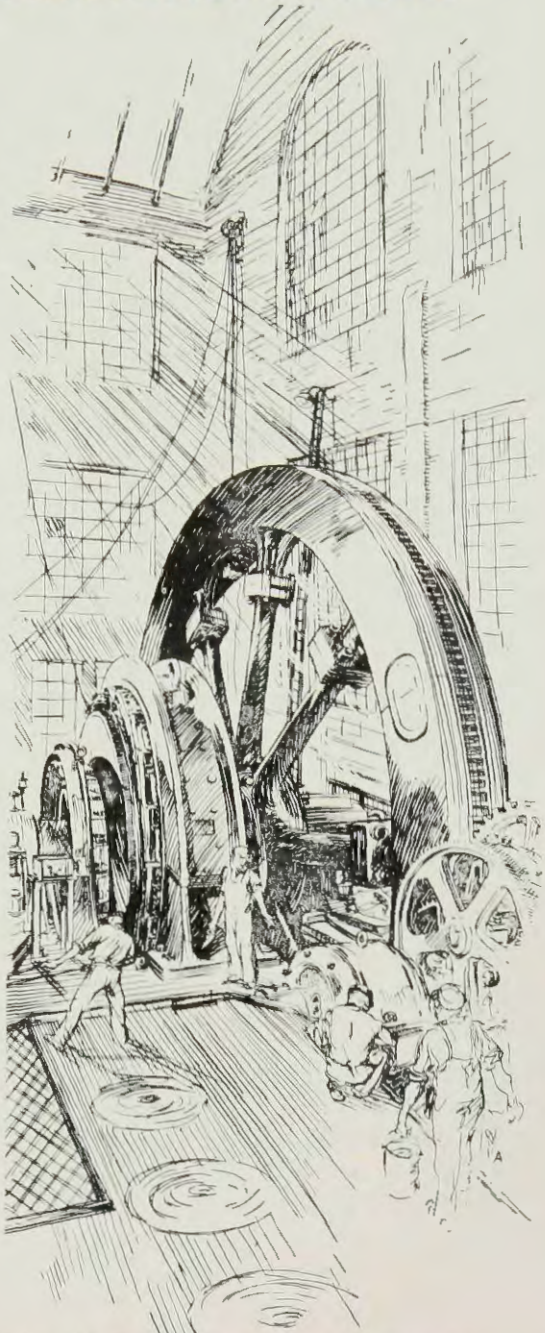
Lysaght's are now producing in their Newcastle Works sufficient Galvanized Iron to supply the whole requirements of the Commonwealth. Maintenance of this output ensures:—

- Direct employment to 1,000 men.
- Indirect employment to a further 1,500 men.
- Purchase of 200,000 tons of coal per year.
- Purchase of 13,000 tons of Australian zinc.
- Purchase of 3,500 tons of Australian acid.
- Purchase of 80,000 tons of Australian steel.

All ensuring regular employment for Australians.

JOHN LYSAGHT (Australia) LTD.

SYDNEY, MELBOURNE, BRISBANE
ADELAIDE AND FREMANTLE



The Flywheel illustrated is 1300 H.P., weighs 160 Tons, and drives the Mills for Sheet Rolling.

Lysaght's Newcastle Works Limited

During the War, a shortage of Galvanized Iron in Australia and the extremely high prices being paid for imported products, led to a movement to make Australia independent of outside sources of supply; and the Commonwealth Government, by giving an assurance that the industry would be adequately protected, definitely encouraged John Lysaght Ltd., of Bristol, to put down Works in Australia, and Lysaght's Newcastle Works is the outcome.

These Works have now cost to build, over £750,000, all of which is English capital.

The plant consists of 16 Mills and 10 Galvanizing Pots, giving an annual capacity of 80,000 tons of Galvanized Sheets. The plant is, of course, right up to date, and the quality of the sheets produced is guaranteed equal to the best imported. The number of men employed on this plant is approximately 1,000, and the number of men employed in supporting industries is calculated at a further 1,500; so that the establishment of these Works has become a very important factor in the unemployment problem of Australia.

When these Works are on full production—which can only be when Australian conditions return to normal—the annual output, as before mentioned, will be 80,000 tons of Galvanized Sheets, which quantity calls for an equivalent quantity of Steel Sheet Bar, made by the Broken Hill Propty.'s Newcastle Steel Works; such Sheet Bar being made from Iron Ore from Iron Knob (South Australia), 13,000 tons of Zinc made by the Electrolytic Zinc Co., Tasmania; 3,500 tons of Acid, made by the Sulphide Corporation, New South Wales; while the total amount of coal required for the manufacture of the raw and finished products will not be less than 250,000 tons.

It is pleasant to know that nearly the whole of the machinery — excepting Electric Motors, Chilled Rolls, and suchlike plant as cannot yet be manufactured in Australia — has all been made locally; and it is confidently anticipated that even such machinery as had to be imported for the starting up of the Works will, on future occasions when extensions are made, be procurable in Australia.

The Works are situated in close proximity to the Broken Hill Proprietary Co.'s Newcastle Works, and form one of the most important subsidiary industries to the great Steel Industry of Newcastle.

NEWCASTLE CITY FROM THE AIR, SHOWING OCEAN IN BACKGROUND

CHEAP ELECTRICITY

IS AVAILABLE AT

NEWCASTLE

— under the —

Control of the Newcastle City Council

Cheap Electricity, Low Rating and Cheap Land must encourage Industries to come to Newcastle.

All particulars available at

THE ELECTRIC SUPPLY DEPT., Town Hall, Newcastle

ELECTRIC SUPPLY DEPARTMENT

The Electricity Supply of Newcastle and District is controlled by the Electric Supply Department of the Newcastle City Council, which generates energy and also purchases in bulk from the Transport Commission of New South Wales. The area of supply controlled embraces the whole of the Newcastle industrial region, including eleven Municipalities, and portion of the Shires of Lake Macquarie and Tarro. Everything possible has been done by the Council to make this public utility a distinct feature in the advance of the manufacturing life of the district.

The view taken by the Council is that whatever may be the source of the energy sold, the paramount question to the manufacturer is the availability of current at lowest cost. This policy has been consistently carried out, and has resulted in the establishment of industries in Newcastle in preference to other centres in the Commonwealth.

The following figures illustrate the growth of industraial Newcastle, and the phenomenal increase in the number of units sold in two decades, and speak volumes:—

	Units Sold	Revenue
1910	776,772	£8,206 0 0
1930	34,300,626	£264,247 0 0

The policy of the Council in connection with this important utility is to develop it at every possible point, believing that the utilisation of electricity results in the increment of wealth to users. In this connection, it can be stated that the Newcastle City Council is simply in the position of a trustee, as, contrary to the practice in many other industrial cities, the surplus monies from its Electric Supply Department cannot be spent for the improvement of roads or other civic services; but, under the Borough of Newcastle Electric Lighting Act, and the Local Government Act, such surpluses must remain in the business.

Cheap electric power, with cheap coal, cheap land, and low municipal rates, must command attention; and the Newcastle District has all these advantages to offer the manufacturer in addition to the essential raw products available.

Newcastle Council can boast that it has never increased its prices for electric supply to the public throughout the history of the concern, and from the commencement of 1925 it has made very substantial reductions, bringing charges below pre-war levels. It can be claimed, also, that the average price obtained per unit sold in the Newcastle District is lower than in most cities of the Commonwealth.

The outlook is favourable to sustained reductions, as with the passing years more and more of the Council's loans obtained to establish the undertaking will be repaid in full, enabling the Council to automatically reduce its charges for power and lighting. Other Electric Supply Undertakings not repaying loans within 20 years have no such outlook.

A recent review of prices charged to manufacturers in different parts of the world shows clearly that the Newcastle manufacturer is favourably placed in the matter of charges for electricity, which, in some industries, forms a considerable percentage of the cost of the finished article; hence the necessity for the manufacturer to locate his work where electricity is cheap at the present and where it must become cheaper in the future, as the Newcastle City Council's financial methods in its Electric Supply Undertakings have distinctly in view the fact that electricity must be made increasingly cheap, thereby helping the local manufacturer to compete with imported products.

Energy is available generally throughout the district,, and the tariffs available have been designed to meet the requirements of the different classes of manufacture. Concerns which require to utilise electricity throughout the 24 hours, five or sixe days a week, have available to them the maximum demand system of charging, which is, in such a case, the most favourable. In other instances, 44 hours on five days per week is the maximum possible, and in such a condition the kilowatt hour rate is available, based upon reduced charges for quantities, and for special seasonal requirements, such as refrigeration work, specially favourable rates are obtainable.

The fact that some industries are obtaining electricity at exceedingly low rates under present conditions is undeniable evidence that with the development of further industries in the district and increased consumption, the readjustment of costs generally and the repayment of loans, the already low rate must assuredly put Newcastle permanently in the forefront as an industrial centre in the matter of cheap electricity.

The fullest information is obtainable in relation to any proposal, large or small, from the Electrical Engineer and Manager, Town Hall, Newcastle.

Cable or telegraphic address of the Department is "Elecpower," and urgent communications receive prompt attention.

Hunter District Water Supply & Sewerage Board

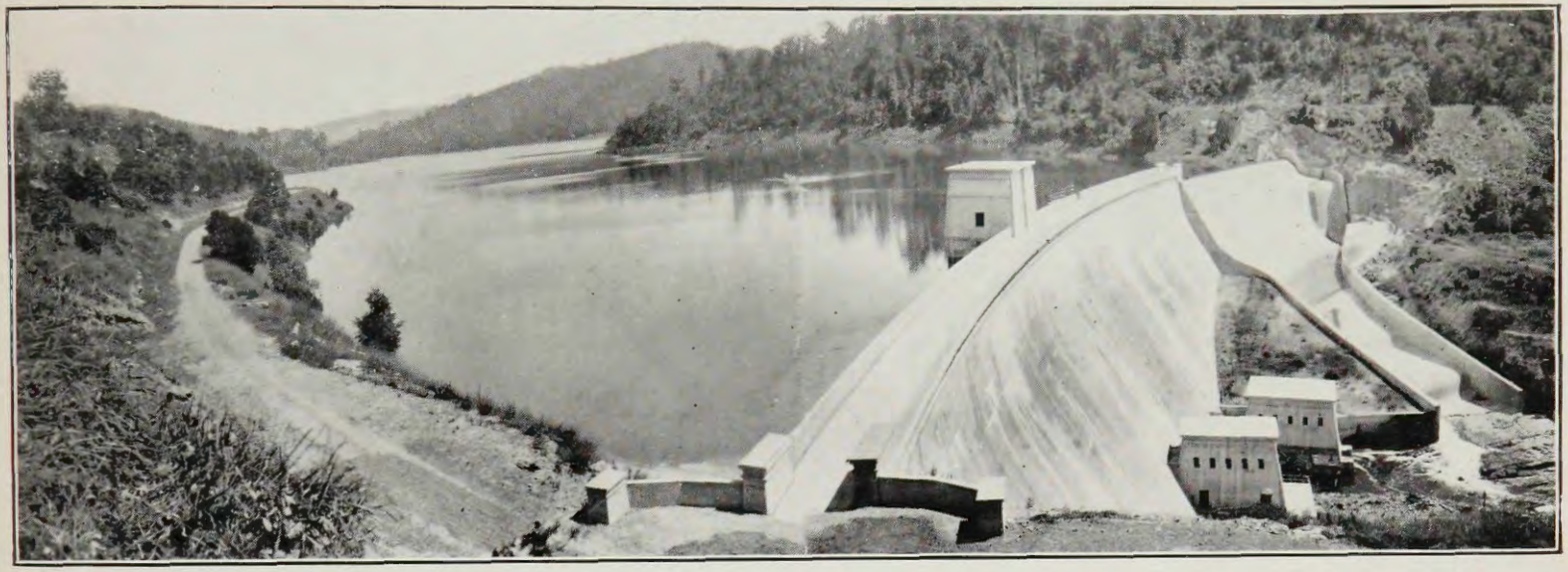
SUPPLY TO LARGE INDUSTRIAL CONSUMERS

The Board is prepared to supply large consumers of water for trade and industrial purposes at a SPECIALLY REDUCED PRICE.

The anaylsis of the water shows it to be very soft, pure, and specially suitable for all domestic, trade, and industrial purposes.

Intending consumers for such purposes may obtain all necessary information in regard to terms and conditions upon furnishing details of the property to be supplied, and estimated maximum daily and annual requirements for a specific period ahead.

ALFRED E. FRY, Secretary,
Hunter District Water Supply & Sewerage Board
P.O. Box 33, Newcastle West, N.S.W.



VIEW OF CHICHESTER DAM

DESCRIPTION

The Hunter River District Water Supply and Sewerage Board controls the water supply, sewerage and stormwater drainage services of the Hunter District, embracing the City of Newcastle and Suburbs, the agricultural townships in the Hunter Valley at Maitland, and the Coal Mining Townships on the Newcastle, South Maitland and Cessnock Coalfields.

Water is obtained from the Chichester River Catchment of 76 square miles in the Mount Royal Ranges.

NEWCASTLE PUBLIC LIBRARY
W. J. Gould Collection

Richly endowed by Nature, the District is widely acknowledged to be one of the most beautiful, from a scenic point of view, in the State. Tourists sing its praises. The glorious valleys, backed by rugged hills and mountains, form vistas of beauty, and nothing is more entrancingly beautiful than the natural charms of the gorgeous Wangat and Chichester scenery within the domain of the Board's area.

The following is a brief description of the Chichester Dam, constructed on the Chichester River at a site below the junction with the Wangat or Little River, which gives but a faint idea of the great quantity of water impounded.

Capacity	5,000,000,000 gallons
Greatest Depth of Water	121 feet
Greatest height of Wall above foundation ..	135 feet
Length of Wall	834 feet, including 280 feet spillway
Area of Lake at fully supply level	455 acres.

BAR BEACH, NEWCASTLE

NEWCASTLE DISTRICT ABATTOIR BOARD

ABATTOIR AT WARATAH, NEWCASTLE, N.S.W.

Incorporated under Special Act of Parliament to control the slaughtering of meat for consumption in the Municipalities of Newcastle, Adamstown, Carrington, Hamilton, Lambton, Merewether, New Lambton, Raymond Terrace, Stockton, Wallsend, Waratah and Wickham, and parts of Lake Macquarie, Port Stephens and Tarro Shires.

The Board manufactures and processes:—Beef Tallow, Mutton Tallow, Miners' Tallow, Premier Jus, Dripping, Lard, Neatsfoot and Trotter Oils, Fertilizers, Sawn Bones, Hoofs, Horns, Sinews, Gluepieces, Cow and Pig Hair, Pork Casings, Mutton Runners and Sheep Bungs, Ox Runners, Ox Bungs (long and short), Bladders, Middles and Weasands, Fiddle Strings, Ox Pituitary, Sheep Thyroid, and other Glands, N.A. Bacon and Hams, and Poultry Foods.

The Board undertakes on Owner's account the slaughtering of meat for local consumption, the slaughtering and freezing of Beef and Mutton for export, and the Curing of Bacon.

NEWCASTLE DISTRICT ABATTOIR BOARD
Board's Office: SCOTTISH HOUSE, HUNTER STREET,
NEWCASTLE, N.S.W.

Newcastle Abattoirs

The Newcastle District Abattoir Board was created by special Act of Parliament in 1913 to introduce a necessary public health reform in the interests of residents of the City of Newcastle and its surrounding suburbs. The Abattoir is a Municipal undertaking, controlled by a Board who are elected triennially by the Aldermen and Councillors of the Municipalities and Shires in the Board's district. It was opened in June, 1916, and automatically closed 35 small slaughterhouses. All meat now consumed in the Board's area is thoroughly inspected before finding its way to the shops of Master Butchers, the cost of such slaughtering and inspection being a small fraction of a penny per pound of meat. The Newcastle Abattoirs has a most up-to-date plant and method of ensuring the utmost protection to the public health. The concentrated killing enables all waste to be eliminated by the manufacturing and processing of the various by-products from the cattle, sheep and pigs.

A recent product of the Board is N.A. Bacon and Hams, which are processed at the Board's Bacon Factory, the only Bacon Factory in the Newcastle District. The excellent and delicious flavour of N.A. sugar-cured bacon and hams has been freely commented on, and this business is now an important adjunct of the Abattoir.

N.A. Poultry Foods, viz., Dried Meat (with bone), Dried Blood (ground fine), Meat Extract Meal, Bone Grit, Bone Grit Meal, and Tri-cal-os, are highly nutritious, easily digestible and palatable foods, and are absolutely free from any injurious substances. They are made daily from meat, blood and bone products of animals killed at the Abattoir, and are packed in 25, 50, 70 and 100lb. bags.

Facilities are also available at the Abattoir for the slaughtering, inspection and freezing for export; and at present the Board can handle up to 150 cattle or 4,000 sheep per week.

The number of employees now engaged at the Abattoir is approximately 200. Wages paid in 1931 amounted to £41,063/2/1 as against £10,788/1/7 for the first complete year in 1917, and shows one of the many phases in the growth and development of this undertaking.

NEWCASTLE BEACH AND HOLIDAY CROWD

NEWCASTLE

DELIGHTFUL TOURIST RESORT

Tourists who may be able to spend a few days or weeks in Newcastle, and people who are seeking a health resort, will find the city and its surroundings delightful in the extreme.

The City is ideally situate, overlooking the Pacific Ocean, the long rollers of which break on the main beach not more than three hundred yards from the Post Office and the chief business centre. This and the adjacent beaches are famous throughout Australia for their golden sands and the opportunity they afford for surf-bathing throughout the year. Travellers who have visited beaches the world over are emphatic in declaring that none excels the beaches of Newcastle, and many which are widely advertised have less natural attractions.

In addition to these natural attractions, Newcastle Beaches have fine promenades leading down to the sands, well-appointed Surf Sheds, and shelter sheds for large numbers of visitors. On the slope above the main section of the beach, the Newcastle City Council has just completed a very fine staging, with seating accommodation for hundreds of spectators who may wish to view the surf carnivals below, or listen to the music of the band in the adjacent rotunda.

A special feature, also, of the ocean front, is the very large Ocean Bath, hewn out of the native rock. This Bath is 150 yards long by 50 yards wide. It is filled by the rising tide, and is a favourite resort and a convincing ground in competitive natatorial events.

For those who appreciate the fresh breakers yet desire to bathe in safety, choice lies between the Bar Beach Ocean Baths, the Bogey Hole (a large bathing pool cut out of the solid rock for the

sole use of the Military Commandant in the days when Newcastle was a military establishment), and the Soldiers' Baths. In all of these, bathing may be indulged in freely during the greater part of the year, rough weather being the only (and occasional) deterrent.

In connection with the very fine Bar Beach Baths, the Newcastle City Council has let a contract for nearly £11,000 for the carrying out of additional improvements, which will make these baths probably the finest in Australia. The work has been commenced, and will be carried through rapidly, so that the public may have the benefit of the baths during the greater part of the coming summer season.

The higher residential portion of the city rests on hills which overlook the business area and the port, with beautiful views of the ocean eastward. English and American visitors have spoken enthusiastiaclly of the wonderful seascapes which may be viewed from many vantage points.

Nestling between two folds of the higher hill is King Edward Park, which commands a wonderful view of the Pacific Ocean, stretching away to the horizon eastward. Turning to the northward, the eyes of the visitor are charmed with the exquisite colourings of cliff and beach, the bold headland of Nobbys (at the entrance to the Port), the rollers breaking on shore in the foreground and the great sweep of Newcastle Bight, with its twenty miles of unbroken sands, running right up to the entrance to Port Stephens. On a day of bright sunshine—and such days are many in this favoured place—the colourings and the general ensemble of the scene baffle description. Nowhere in the world is Nature more lavish with the colours from her palette, and nowhere are they more effectively used. Visitors standing on the upper walks of King Edward Park will be delighted with the panorama unfolded before them.

Man has ably seconded the work of Nature in this spot, and beautiful garden plots, shady trees, and walks leading to points which overlook the ocean increase the pleasure of all who are fortunate enough to be able to visit this lovely park.

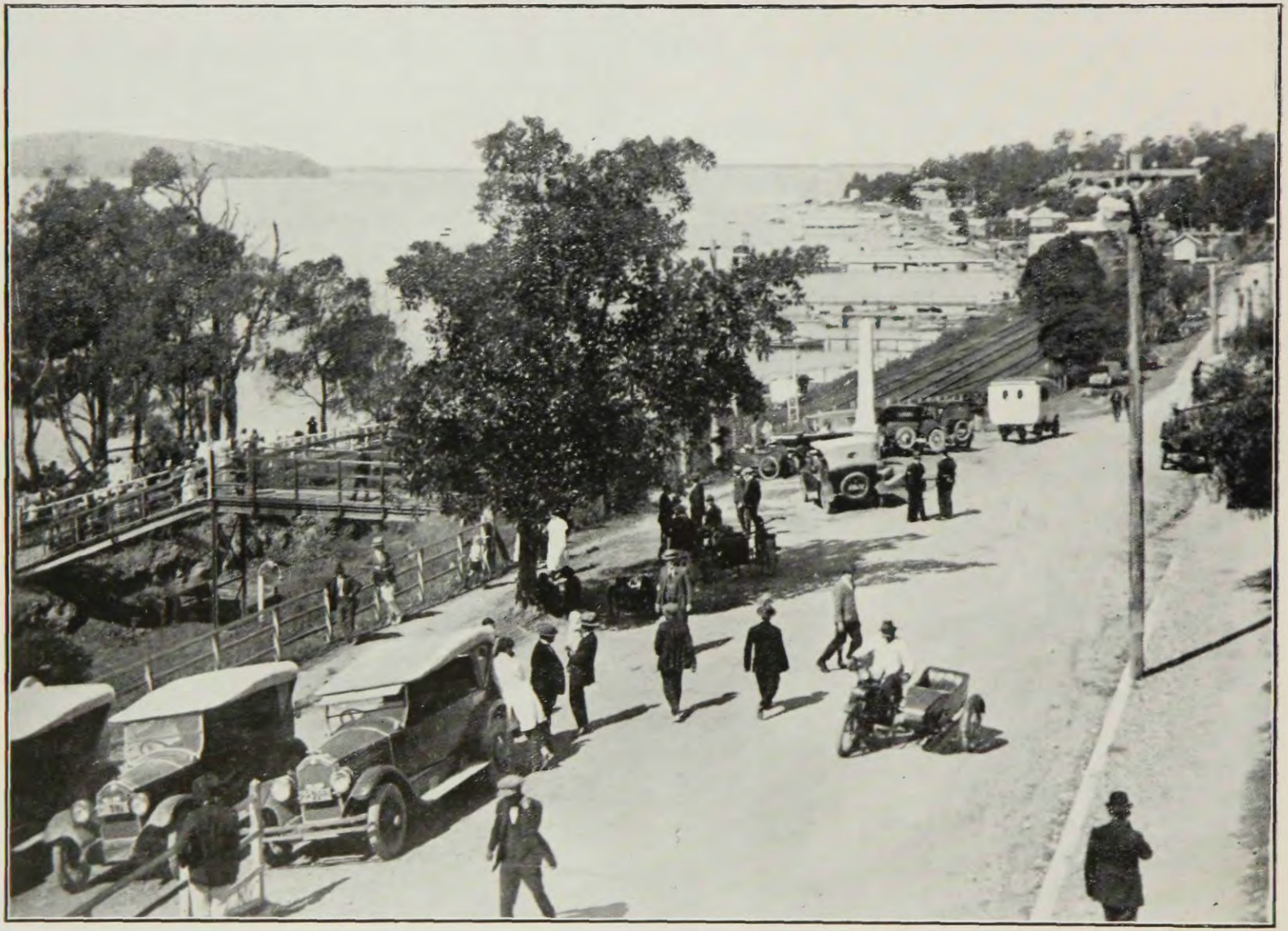
Motoring out by roads running west and south, splendid views are obtained of the whole of the city and suburbs from the heights of Lambton and the Adamstown-Charlestown road. The road through Charlestown is portion of the great highway between Newcastle and Sydney, and the motorist, after he has passed through Charlestown, would do well to turn off to the little town of Dudley. From the heights just before entering the town, a magnificent view may be obtained of the vast sweep of wooded country running back to the Sugarloaf Mountain, with small towns nestling here and there. To the south, the wonderful Nine-Mile Beach is in full view, and to the north, the eye runs along the oecan front to the bold escarpment of the headland known as Little Redhead. Continuing through the town of Dudley, the road leads to the top of the cliff, where the views are comparable to the magnificecnt scenes from King Edward Park, Newcastle. Turning off through Dudley to the south, a by-road takes the traveller to Nine-Mile Beach.

Lake Macquarie

To the south of Newcastle, the northernmost end being only eight miles distant by rail or road, is beautiful Lake Macquarie. Twenty-two miles long, five to six miles wide in places, and with many deep bays which give a total shore-line of about 130 miles, Lake Macquarie is one of the most beautiful sheets of water in Australia. Around it cluster many towns and villages, where the visitor and the health-seeker will find excellent hotel and other accommodation. The lake, with its waters as placid as a sea of glass in the early morning, and showing an infinite variety of colouring and movement through the day, is a never-ending source of delight to visitors.

The lake is an ideal place for boating and fishing, and as a health resort it is equalled only by the far-famed Blue Mountains of New South Wales.

The headquarters of a strong Sailing Club and an equally strong Motor Yacht Club, it is the competing ground for Club, inter-Club and Championship races throughout the season of seven months, with regattas on a large scale at holiday times. The waters of the Lake are admirably suited



TORONTO, LAKE MACQUARIE

for speedboat racing, and there is a proposal afoot that the speed championships of the State and of Australia should be decided over the course at Toronto, where the Yacht Club holds its races and carnivals.

Port Stephens

The great sheet of water known as Port Stephens is about the same distance north of Newcastle as Lake Macquarie is south of the city. Port Stephens is the largest harbour on the New South Wales coast, north of Sydney, and it has many beautiful features. However, its waters are more exposed than those of Lake Macquarie, and it is less attractive as a place of residence. Nevertheless, it draws many tourists, who delight in the natural beauty, almost untouched by man.

There is no inlet in Australia which provides the fishing which may be had at Port Stephens. In the average season, nearly a million baskets of fish are sent away to the Sydney market; and with the line, more game fish are caught than at any other fishing ground in the State. Tunny and other game fish provide excellent sport.

Leading northward from Port Stephens are the beautiful Myall River and Myall Lakes, which are a constant delight to visitors. All these places are quickly and easily reached from Newcastle.

Charming river scenery is found within a short distance of Newastle, either by train or boat, on the Paterson and Williams Rivers, tributaries of the Hunter River. The Paterson is noted for its fine reaches, with willow-clad banks, and its perch and other fishing. Artist and angler, as well as the ordinary tourist, will find much to delight them as they move up and down this fine stream.

CLIMATE AND RAINFALL

The climate of Newcastle is remarkably equable for a city situate on the fringe of a large continental mass. It is only nine degrees south of the Tropic of Capricorn, but the great volume of the South Pacific Ocean tempers the climate, and it is also influenced by the cool southerly winds which come up from the Antarctic Ocean.

In the summer time, the temperature rises above 85 degrees on only a limited number of days, the mean maximum temperature being 71.9 degrees; and in winter it rarely drops below 50 degrees, the average mean minimum temperature being 57.1 degrees. It can be stated confidently that for nine months in the year the range of temperature is between 50 and 80 degrees. Medical men affirm it is one of the healthiest climates in the world, the dryness of the air making the hottest days in summer much more bearable than the temperature of places further removed, north and south, from the equator. Similarly, the cold of winter—it is a rare thing for the thermometer to fall below 40 degrees—has none of the rawness which is so trying in less favoured localities.

The average rainfall over the last ten-year period has been 42.6 inches. Wet spells, such as are common in other countries, are practically unknown, and the number of hours of sunshine in the year is very high. For workers and for tourists, the climate is delightful.

POPULATION

The latest official figures show that the population of Newcastle and suburbs is 120,000, and that the city is the capital of a district having a population of over 200,000.

FISHING INDUSTRY

Reference is made elsewhere to the enormous quantities of fish obtained in the waters of Port Stephens, just north of Newcastle; but these hauls represent only a tithe of the rich harvest which is now being gathered by means of trawlers, along the "shelf" which runs out from the mainland for about ten miles into the ocean.

This rocky shelf is covered, over a large area, with sandbanks lying at a depth of a few score fathoms, and making ideal feeding grounds for schnapper and other fine fish. There is no reason why large quantities of these fish should not be canned or smoked in factories at Port Stephens or along the Hunter River.

The Fisheries Department advises that mullet, tailer, kingfish, trevally and blackfish are most suitable for smoking; and that the species which could be canned with profit are mullet, pilchard (including sandy and blue sprats and anchovies), southern tunney, Spanish mackerel, prawns and crayfish.

As Australia imports a few million pounds' worth of fish every year, there is a fine opening for an enterprising company.

Rod and line fishing afford excellent sport, both alongshore and immediately off the coast. Anglers are well catered for, and trips out to the fishing banks are made frequently. Special trips can also be arranged, to suit the convenience of visitors.

WHEAT SILOS

The wheat lands in the North and North-West portions of New South Wales, of which Newcastle is the natural port, are amongst the best in the world. The Agricultural Gazette of N.S.W., an official publication, in the issue of last February, stated, after referring to the splendid crops raised in the North: "It seems extraordinary that such excellent yields should be attained by so little tillage. Only 40 per cent. of the entries" (for the wheat competition) "were ploughed, the remainder being tilled by cultivator only. At Boggabri, a 34-bushel crop was produced with one 'springtoothing' 52 days prior to seeding." Wheatgrowers state they get, year after year, ten to twelve-bag crops—30 to 36 bushels—off the same land, with only short summer fallowing.

The remarkable fertility of these lands, and the fact that the grain is the best produced in Australia in ordinary season, is directing attention more and more to the possibilities of this great area; and it is confidently affirmed that in the near future the Northern wheat crop will be from ten to twelve million bushels.

To cope with these harvests, the Government has been urged to construct a number of silos in the North and North-West Districts of the State, and a large terminal elevator at Newcastle for the handling and shipment of the grain in bulk. The matter has been placed before the Hon. the Premier in such a convincing manner that he has practically promised that this important work will be carried out during the next eighteen months.

The total wheat harvest of the North last season was about 6,500,000 bushels, but the area under crop is being increased each season, so that it should quickly reach ten or twelve million bushels per annum. The greater portion of this crop would be handled through the Newcastle elevator, the balance being milled at country centres or sent to Queensland by rail.

RAILWAY SERVICES

Newcastle stands at the junction of the Sydney and Northern railway systems, the latter including the North Coast, Northern and North-Western lines.

Being only 100 miles from Sydney, there is a good passenger service between the cities, including fast trains which cover the distance in two and three-quarter hours. In addition to the fast trains, there are several semi-fast and slow passenger trains each day, both up and down. Travellers over this line always find pleasure in the beautiful scenery between the Hawkesbury River and Gosford, the line crossing the river and then running for several miles along the shore of Brisbane Water.

Between Newcastle and the North there are also good services daily, and express trains run to and from Brisbane, the capital of Queensland. Suburban services, covering a radius of about 25 miles from Newcastle, are good.

The goods services between Newcastle and Sydney and to towns in the North are also excellent; and Newcastle has the further advantage of a daily passenger and goods service by steamer, with Sydney. All classes of goods are thus handled expeditiously and at moderate rates, both by rail and by water.

HUNTER RIVER VALLEY.

AGRICULTURE AND FRUIT GROWING

Newcastle is the Port of the wonderfully-endowed Hunter River Valley, the total area of which is about 7,000 square miles. The Valley was one of the first areas of New South Wales to be settled after the founding of the Colony, and nowhere in the Commonwealth has there been discovered an equally compact area so rich and suitable for varied agricultural production.

The population of the Valley to-day is about 300,000, but its potentialities in agriculture, dairying, fruit-growing, and mining are such that it could readily support in comfort at least 1,000,000 people.

In the production of fruits, the varieties challenge comparison with those grown in any area of similar size in the world. Bananas may be grown in a few favoured spots, and the range covers practically all the chief fruits down to cherries and gooseberries, which may be produced on the slopes of the Mount Royal Range in profusion and of high quality.

In portions of the Paterson River Valley—the Paterson is a tributary of the Hunter—walnuts grow to a perfection unknown in the colder climes from which the tree comes, while Japanese plums take on a lusciousness which astonishes all who are privileged to taste them. In other portions of the Hunter Valley, high quality apples and pears are grown, and the size of some of these is almost past belief, and the quality is excellent.

All known varieties of citrus fruits and grapes are, however, the two chief products of the Hunter Valley, in the way of fruits. Paterson oranges have a world-reputation, and beautiful wine and table grapes have been grown from the time when the first colonists settled here. Wine of the highest quality has been produced, and the names of old-established Hunter River wineries are known throughout Australia, and their products find ready sale in the East and in Great Britain. There is scope for large development in this industry.

What has been said of fruit-growing is equally applicable to vegetable-growing. Visitors from Californa have expressed the opinion that portions of the Hunter River Valley are better suited for fruit and vegetable-growing than is their own famous State. It will be realised, therefore, that the Valley presents a wonderful field for the manufacture of preserved and evaporated fruits and vegetables, and also of jams and marmalades.

Dairying is one of the chief industries of the Valley, and this could be greatly extended in certain areas, with the adoption of hand-feeding and the use of high-grade dairy stock. Some of the herds are of high quality, but the animals milked by a number of farmers could be greatly improved. Here, also, there is a wonderful opening for butter and cheese-making.

Apiculture has not reached the same stage of development, but the uplands and the hills in the north and west might be profitably exploited in this respect, for many of our forest trees yield rich returns of honey; nor should the possibility of the lucerne (alfalfa) fields be overlooked.

The manufacturer will find much to attract him to the Hunter River Valley, and many avenues in which to employ his capital.

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Timber Resources

Probably no portion of Australia was more richly endowed with high-class hardwoods and softwoods than the Hunter River Valley and the foothills leading therefrom on to the mountains southward and northward.

When the first white men went up the Hunter River as far as Wallis Plains (now the site of the town of West Maitland and the rich farms surrounding it), they were amazed at the wealth of timber, and particularly of cedar. This fine timber was used for many purposes, even for the making of barrows and other things of daily use. All the good cedar of the earlier years has long since been cut, but even a few years ago solitary trees were to be found, indicating how it had flourished on the river flats. To-day, there would be no difficulty in putting down small plantations of this wood, in places where agriculture is not a success. The trees would serve as breakwinds for stock, give shelter in the great heat of summer, and now and then mature trees could be cut and sold, bringing a high return to the owner.

Hardwoods of many kinds were even more prolific, and the quality was superb. In a number of buildings erected over a hundred years ago, these timbers, used for wall-plates and in the roofs, are as sound as the day they were place in position, and will apparently last for many centuries, if the buildings are not demolished. Ironbark slabs, used in some of the rougher buildings on outlying farms, and exposed to the weather and to periodic floodings for eighty years, are sound to-day; and are so hard that they will turn the edge of all but the best tools.

Although these supplies of softwood and hardwood timbers have long since been exhausted, there are still, on the ridges which lead up from the valley on the north and the south, and more particularly on the plateaux—Barrington, Bulga and Comboyne—to the northward, enormous supplies of splendid timbers. On the southern slopes of the Barrington Plateau is a beech forest covering thousands of acres; in the gorges formed by the downward rush of the rivers which head in that

plateau are to be found magnificent hardwoods, much of which has not been touched, owing to the lack of roads leading in to where these trees grow; and in the deeper fastnesses are splendid groves of cedar and other softwoods.

Farther north, the Bulga Plateau and the Comboyne Plateau carry hardwood and softwood timbers which are a delight to those who prize high-class woods. An expert, who has passed many years at a point midway between the two plateaux, estimates there are at least 140 different kinds of timbers in these favoured regions, where the rainfall runs up to 100 inches a year. In addition to the forest giants, which will give poles and piles up to 90ft. long, there is a wonderful variety of woods suitable for the finest cabinet and inlay work. A cabinet made of these woods, and inlaid with the special timbers referred to, was fashioned by the expert mentioned above, and was presented to His Royal Highness, the Prince of Wales, when he visited Australia in 1922. The Prince was delighted with the skilful work, and equally at having such an object lesson of the value of the timbers growing in the Commonwealth.

The Railway Department draws a large proportion of its hardwood for sleepers and poles from these plateaux, and up as far as the Dorrigo Plateau; and the magnificent poles carrying the high-tension electric cables between Newcastle and Wyong and Newcastle and Singleton, were obtained from these forests. No better example of high-grade hardwood could be found in any part of the world.

Therefore, any manufacture into which timber enters largely, either for buildings or other purposes, can be well served by the forests which still remain within easy distance by rail or water of the City of Newcastle.

Possibilities of Afforestation

Knowing the potentialities of the Hunter and Manning River Districts and of the tablelands at their heads, in the matter of the production of both hardwoods and softwoods, attention is being given to the setting out of plantations. These consist of pines, for they grow quickly and offer a

readier return for the money invested. There is scope for plantations on a much wider scale, not only of fir trees, but of other softwoods, as there is an increasing demand for wood pulp, and also for certain woods for box-making. Already a company has been proposed for the manufacture of paper in the Port Stephens district, and Newcastle offers equal if not greater advantages for the same thing.

Those who are able to take a longer view, will see, we are sure, that there is money to be made through the planting of some of the higher-grade hardwoods—ironbark, tallow wood, spotted gum, etc. There are large areas on the ridges and highlands which are of little use for grazing, and absolutely useless for agriculture; yet, planted with trees and the honey rights leased to bee-keepers, they would yield large returns in a few decades. Some of the special soft woods, which prefer the higher altitudes, could be judiciously interspersed, and the result should be gratifying to all concerned in the venture. Timber is becoming more and more valuable; there will soon be a world shortage, and in the Hunter Valley and to the northward lies an area of country which is unrivalled anywhere for the production of hard and soft woods.

Large quantities of timber, in the shape of piles, girders, and railway sleepers, are sent away each year from Newcastle and Port Stephens (only a few miles to the north of Newcastle). The quantity exported from this Port has reached six million super. feet in one year, and magnificent hardwood piles up to 90 feet long have been included in the shipments. This trade could be expanded considerably by seeking out new markets in the East.

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